



## *Treaty Series*

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*Treaties and international agreements  
registered  
or filed and recorded  
with the Secretariat of the United Nations*

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VOLUME 1100

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## *Recueil des Traités*

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*Traités et accords internationaux  
enregistrés  
ou classés et inscrits au répertoire  
au Secrétariat de l'Organisation des Nations Unies*

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#### NOTE BY THE SECRETARIAT

Under Article 102 of the Charter of the United Nations every treaty and every international agreement entered into by any Member of the United Nations after the coming into force of the Charter shall, as soon as possible, be registered with the Secretariat and published by it. Furthermore, no party to a treaty or international agreement subject to registration which has not been registered may invoke that treaty or agreement before any organ of the United Nations. The General Assembly, by resolution 97 (I), established regulations to give effect to Article 102 of the Charter (see text of the regulations, vol. 859, p. VIII).

The terms "treaty" and "international agreement" have not been defined either in the Charter or in the regulations, and the Secretariat follows the principle that it acts in accordance with the position of the Member State submitting an instrument for registration that so far as that party is concerned the instrument is a treaty or an international agreement within the meaning of Article 102. Registration of an instrument submitted by a Member State, therefore, does not imply a judgement by the Secretariat on the nature of the instrument, the status of a party or any similar question. It is the understanding of the Secretariat that its action does not confer on the instrument the status of a treaty or an international agreement if it does not already have that status and does not confer on a party a status which it would not otherwise have.

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Unless otherwise indicated, the translations of the original texts of treaties, etc., published in this *Series* have been made by the Secretariat of the United Nations.

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#### NOTE DU SECRÉTARIAT

Aux termes de l'Article 102 de la Charte des Nations Unies, tout traité ou accord international conclu par un Membre des Nations Unies après l'entrée en vigueur de la Charte sera, le plus tôt possible, enregistré au Secrétariat et publié par lui. De plus, aucune partie à un traité ou accord international qui aurait dû être enregistré mais ne l'a pas été ne pourra invoquer ledit traité ou accord devant un organe des Nations Unies. Par sa résolution 97 (I), l'Assemblée générale a adopté un règlement destiné à mettre en application l'Article 102 de la Charte (voir texte du règlement, vol. 859, p. IX).

Le terme «traité» et l'expression «accord international» n'ont été définis ni dans la Charte ni dans le règlement, et le Secrétariat a pris comme principe de s'en tenir à la position adoptée à cet égard par l'Etat Membre qui a présenté l'instrument à l'enregistrement, à savoir que pour autant qu'il s'agit de cet Etat comme partie contractante l'instrument constitue un traité ou un accord international au sens de l'Article 102. Il s'ensuit que l'enregistrement d'un instrument présenté par un Etat Membre n'implique, de la part du Secrétariat, aucun jugement sur la nature de l'instrument, le statut d'une partie ou toute autre question similaire. Le Secrétariat considère donc que les actes qu'il pourrait être amené à accomplir ne confèrent pas à un instrument la qualité de «traité» ou d'«accord international» si cet instrument n'a pas déjà cette qualité, et qu'ils ne confèrent pas à une partie un statut que, par ailleurs, elle ne posséderait pas.

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Sauf indication contraire, les traductions des textes originaux des traités, etc., publiés dans ce *Recueil* ont été établies par le Secrétariat de l'Organisation des Nations Unies.

**I**

***Treaties and international agreements***

***registered***

***on 8 August 1978***

***No. 16897***



No. 16897

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**MULTILATERAL**

**International Convention concerning the carriage of goods by rail (CIM) (with annexes). Concluded at Berne on 25 February 1961**

**Amendments to the above-mentioned (CIM) Convention of 25 February 1961 made in accordance with the decisions of the Revision Committee at the Session of November 1967 [at Berne]**

**Amendments to the text of Annex I (International Regulations concerning the carriage of dangerous goods by rail (RID)) to the above-mentioned (CIM) Convention of 25 February 1961**

**Amendments to the text of Annex I (International Regulations concerning the carriage of dangerous goods by rail (RID)) to the above-mentioned (CIM) Convention of 25 February 1961**

**Additional Protocol to the International Conventions of 25 February 1961 concerning the carriage of goods by rail (CIM) and the carriage of passengers and luggage by rail (CIV).<sup>1</sup> Concluded at Berne on 25 February 1961**

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<sup>1</sup> United Nations, *Treaty Series*, vol. 1101, p. 2.

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(continued)

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**Protocol A drawn up by the Diplomatic Conference convened with a view to bringing into force the International Conventions of 25 February 1961 concerning the carriage of goods by rail (CIM) and the carriage of passengers and luggage by rail (CIV).<sup>1</sup> Concluded at Berne on 29 April 1964**

**Protocol B drawn up by the Diplomatic Conference convened with a view to bringing into force the International Conventions of 25 February 1961 concerning the carriage of goods by rail (CIM) and the carriage of passengers and luggage by rail (CIV).<sup>1</sup> Concluded at Berne on 29 April 1964**

**Termination of the above-mentioned (CIM) Convention of 25 February 1961**

*Authentic texts: French.*

*Registered by Switzerland on 8 August 1978.*

*(For the authentic French text, see volume 1099.)*

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<sup>1</sup> United Nations, *Treaty Series*, vol. 1101, p. 2.



[OFFICIAL ENGLISH TRANSLATION<sup>1</sup> — TRADUCTION ANGLAISE OFFICIELLE<sup>2</sup>]

## INTERNATIONAL CONVENTION<sup>3</sup> CONCERNING THE CARRIAGE OF GOODS BY RAIL (CIM)

The undersigned plenipotentiaries,

Having recognised the need to revise the International Convention concerning the Carriage of Goods by Rail, signed at Berne on 25th October, 1952,<sup>4</sup> have to that end resolved, in accordance with article 67 of that Convention, to conclude a new Convention and have agreed upon the following articles:

### PART I. PURPOSE AND SCOPE OF THE CONVENTION

#### Article 1. RAILWAYS AND TRAFFIC TO WHICH THE CONVENTION APPLIES

1. This Convention shall apply, subject to the exceptions set forth in the following paragraphs, to the carriage of goods consigned under a through consignment note for carriage over the territories of at least two of the Contracting States and exclusively over lines included in the list compiled in accordance with article 59 of this Convention.

2. Consignments despatched from and destined for stations\* situated in the territory of the same State, which pass through the territory of another State

\* The expression "station" includes ports used by shipping services and all road service establishments open to the public in connection with the performance of the contract of carriage.

<sup>1</sup> Translation supplied by the Government of the United Kingdom.

<sup>2</sup> Traduction fournie par le Gouvernement du Royaume-Uni.

<sup>3</sup> Came into force on 1 January 1965 (with the exception of annex I, which entered into force on 1 April 1967) in respect of the following States on behalf of which an instrument of ratification, an application for accession or a notification of application by internal legislation\* in accordance with chapter I of the Additional Protocol of 25 February 1961\*\* had been deposited with the Government of Switzerland, after 15 instruments of ratification had been deposited with the latter, in accordance with article 66 of the Convention and paragraph 1 of Protocol A drawn up by the Diplomatic Conference convened to bring into force the International Conventions of 25 February 1961 concerning the carriage of goods by rail (CIM) and the carriage of passengers and luggage by rail (CIV),\*\*\* concluded at Berne on 29 April 1964:†

State	Date of deposit of the instrument of ratification, of the application for accession (a) or of the notification of application by internal legislation (n)	State	Date of deposit of the instrument of ratification, of the application for accession (a) or of the notification of application by internal legislation (n)
Austria .....	10 August 1964	Morocco .....	24 September 1963 a
Belgium .....	17 March 1964	Netherlands .....	26 September 1963
Bulgaria .....	29 April 1963	Norway .....	9 August 1963
Czechoslovakia .....	14 March 1963	Poland .....	4 November 1963
Denmark .....	13 September 1961	Portugal .....	4 December 1963
Finland .....	14 April 1964	Romania .....	14 August 1962
France .....	30 May 1962	Spain .....	19 February 1963
German Democratic Republic ..	20 November 1964 n	Sweden .....	27 June 1963
Germany, Federal Republic of ..	24 December 1964 n	Switzerland .....	25 July 1962
Hungary .....	29 March 1962	United Kingdom of Great Britain and Northern Ireland .....	9 April 1964
Italy .....	12 November 1963	Yugoslavia .....	21 February 1964
Liechtenstein .....	24 October 1963		
Luxembourg .....	26 November 1964		

(Continued on p. 6)

only in transit, shall be governed by the law of the State in which they are despatched:

- (a) When the lines over which the consignment is carried in that other State are exclusively operated by a railway of the State in which the consignment is despatched;
- (b) When the lines over which the consignment is carried in that other State are not exclusively operated by a railway of the State in which the consignment is despatched, if the railways concerned have concluded agreements under which such carriage is not regarded as international.

3. Consignments between stations in two adjacent States shall, if the lines over which the consignments are carried are exclusively operated by railways of one of those States, be governed by the law of that State, provided that the sender, by his choice of the form of consignment note, elects that the internal regulations relating to those railways shall apply, and provided that such application is not contrary to the laws and regulations of either of the States concerned.

#### Article 2. PROVISIONS CONCERNING CARRIAGE BY MORE THAN ONE FORM OF TRANSPORT

1. Regular road services or shipping services which are complementary to railway services and on which international traffic is carried may, in addition to railway services, be included in the list referred to in article 1 of this Conven-

(Footnote 3 continued from p. 5)

Subsequently, the instruments of ratification or the applications for accession were deposited with the Government of Switzerland on the following dates:

State	Date of deposit of the instrument of ratification, or of the application for accession (a)	State	Date of deposit of the instrument of ratification, or of the application for accession (a)
Tunisia	23 January 1964 a	Ireland <sup>†††</sup>	13 May 1969 a
(With effect from 21 November 1965. <sup>††</sup> )		(With effect from 1 February 1970. <sup>††</sup> )	
Syrian Arab Republic <sup>†††</sup>	24 April 1964 a	Greece	29 July 1969
(With effect from 7 May 1965. <sup>††</sup> )		(With effect from 1 September 1969. <sup>††</sup> )	
Iraq <sup>†††</sup>	1 July 1964 a	Germany, Federal Republic of <sup>†††</sup>	18 August 1972 a
(With effect from 24 August 1965. <sup>††</sup> )		(With effect from 1 April 1973. <sup>††</sup> With a declaration that the Convention will also be applicable to Berlin (West) from the date of its entry into force for the Federal Republic of Germany.)	
Turkey	31 January 1966	German Democratic Republic	18 August 1972 a
(With effect from 1 March 1966. <sup>‡</sup> )		(With effect from 1 April 1973. <sup>††</sup> )	
Iran	2 August 1966 a		
(With effect from 9 March 1968. <sup>††</sup> )			
Algeria	17 October 1967 a		
(With effect from 30 October 1969. <sup>††</sup> )			

\* The particular effects of the notification of application by internal legislation are determined by paragraph 2 of chapter I of the Additional Protocol of 25 February 1961.

\*\* See p. 392 of this volume.

\*\*\* United Nations, *Treaty Series*, vol. 1101, p. 2.

† See p. 400 of this volume.

†† One month after the date of notification by the Government of Switzerland to the Contracting States that the application for accession was deemed to be accepted, in accordance with article 67 (3).

††† See p. 338 of this volume for the texts of the reservations and declarations made upon accession.

‡ On the first day of the second month following the month on which the Government of Switzerland notified the Contracting States of the deposit of the instrument of ratification, in accordance with the last paragraph of Protocol A of 29 April 1964.

<sup>a</sup> United Nations, *Treaty Series*, vol. 241, p. 336 and vol. 242, p. 2.

tion provided that such services, in so far as they connect at least two Contracting States, may only be included in the list by agreement between those States.

2. The undertakings operating such services shall be subject to all the obligations imposed and enjoy all the rights conferred on railways by this Convention, subject always to such derogations as necessarily result from the different forms of transport. Such derogations shall not, however, in any way affect the rules as to liability laid down in this Convention.

3. Any State wishing to have a service of the kind referred to in paragraph 1 of this article included in the list shall take the necessary steps to have the derogations provided for in paragraph 2 of this article published in the same manner as tariffs.

4. In the case of international traffic making use both of railways and of transport services other than those referred to in paragraph 1 of this article, the railways, in conjunction with the other transport undertakings concerned, may, so as to take account of the special features of each form of transport, lay down conditions in the tariffs which have a legal effect different from that of this Convention. The railways may, in such a case, prescribe the use of a transport document other than that provided for by this Convention.

#### *Article 3.* ARTICLES NOT TO BE ACCEPTED FOR CARRIAGE

The following shall not be accepted for carriage:

- (a) Articles the carriage of which is a monopoly of the postal authorities in any one of the territories concerned;
- (b) Articles which, by reason of their dimensions, weight or nature or condition are not suitable for the carriage proposed, having regard to the equipment or rolling stock of any one of the railways concerned;
- (c) Articles the carriage of which is prohibited in any one of the territories concerned;
- (d) Subject to the exceptions provided for in article 4 (2) of this Convention, substances and articles which under the provisions of Annex I to this Convention are not to be accepted.

#### *Article 4.* ARTICLES ACCEPTED FOR CARRIAGE SUBJECT TO CERTAIN CONDITIONS

1. The following articles are accepted for carriage on the following conditions:

- (a) The substances and articles set forth in Annex I to this Convention are accepted subject to the conditions laid down therein;
- (b) Funeral consignments are accepted for carriage subject to the following conditions:
  - (i) They shall be carried *grande vitesse* and accompanied by an attendant unless carriage without an attendant is permitted on all the railways concerned;
  - (ii) Charges shall be paid by the sender;
  - (iii) Carriage shall be subject to the laws and regulations of each State except in so far as such carriage is governed by special conventions between States;

(c) Railway rolling stock running on its own wheels is accepted if a railway verifies that such rolling stock is in running order and so certifies either by marking the rolling stock or by issuing a special certificate; locomotives, tenders, rail motor-coach units and railcars shall in addition be accompanied by a person who is appointed by the sender and shall, in particular, be competent to carry out lubrication;

Railway rolling stock running on its own wheels, other than locomotives, tenders, rail motor-coach units and railcars, may be accompanied by an attendant who shall, in particular, carry out lubrication. If the sender intends to make use of this facility he shall state the fact in the consignment note;

(d) Livestock is accepted subject to the following conditions:

- (i) Consignments of livestock shall be accompanied by an attendant provided by the sender except in the case of small livestock consigned in cages, crates, baskets, etc. which are properly secure. An attendant shall not however be required in such exceptional cases as are provided for in international tariffs or in agreements between railways. The sender shall state in the consignment note the number of attendants or, if the consignments are unaccompanied, shall insert the words "without attendant";
- (ii) The sender shall comply with the veterinary regulations of the country of departure and destination and of those through which the consignment passes;

(e) Articles the carriage of which will give rise to special difficulty by reason of their dimensions, weight, or nature or condition, having regard to the equipment or rolling stock of any of the railways concerned, are only accepted subject to special conditions to be determined by the railway in each case after consultation with the sender; these conditions may derogate from the provisions of this Convention.

2. Two or more Contracting States may arrange, by agreement, that certain substances or articles not acceptable for carriage under the provisions of Annex I to this Convention will be accepted for international carriage between those States subject to certain conditions, or that the substances and articles specified in Annex I to this Convention will be accepted subject to conditions less onerous than those laid down in the said Annex.

Railways may also, by clauses in their tariffs, either accept certain substances or articles not acceptable for carriage under the provisions of Annex I to this Convention, or adopt conditions less onerous than those laid down in Annex I to this Convention for substances and articles accepted under the said Annex.

Such agreements and tariff clauses must be notified to the Central Office for International Railway Transport.

#### *Article 5.* OBLIGATION OF RAILWAYS TO CARRY

1. Every railway shall be bound to undertake the carriage of goods, subject to the terms of this Convention, provided that:

- (a) The sender complies with the provisions of the Convention;
- (b) Carriage can be undertaken by ordinary transport facilities serving the regular traffic requirements;

(c) Carriage is not prevented by circumstances which the railway cannot avoid and which it is not in a position to remedy.

2. The railway shall not be obliged to accept articles the loading, transshipment or unloading of which requires the use of special facilities unless the stations at which these operations are to be carried out have such facilities at their disposal.

3. The railway shall only be obliged to accept consignments the carriage of which can take place without delay; the regulations in force at the forwarding station shall determine the circumstances in which that station is obliged to store temporarily consignments not complying with this condition.

4. When the competent authority decides that:

(a) A service shall be discontinued or suspended totally or partially;

(b) Certain consignments shall be refused or accepted only subject to certain conditions;

such measures shall, without delay, be brought to the notice of the public and of the railways, which shall be responsible for informing the railways of the other States with a view to their publication.

5. The railways may, by agreement and with the consent of their Governments, decide to limit the carriage of goods between certain places to defined frontier points and transit countries.

These measures shall be communicated to the Central Office which shall notify them to the Governments of the Contracting States. They shall be regarded as having been accepted if within one month of the date of notification they have not been opposed by a Contracting State. In the event of opposition, if the Central Office does not succeed in removing the differences of opinion it shall convene a meeting of the representatives of the Contracting States.

As soon as these measures can be regarded as having been accepted the Central Office shall notify the Contracting States. They shall then be entered in special lists and published in the same manner as provided for the publication of international tariffs.

These measures shall come into force one month after the notification by the Central Office laid down in the third sub-paragraph above.

6. Any contravention of the provisions of this article by the railway shall constitute a cause of action to recover compensation for the loss or damage caused thereby.

## PART II. THE CONTRACT OF CARRIAGE

### Chapter I. *FORM AND CONDITIONS OF THE CONTRACT OF CARRIAGE*

#### *Article 6. WORDING AND FORM OF THE CONSIGNMENT NOTE*

1. The sender shall present, in respect of all international consignments governed by this Convention, a form of consignment note prepared by means of carbon copying and conforming with the model contained in Annex II to this Convention. This form shall comprise the following five sheets:

No. 1 consignment note;

- No. 2 invoice;
- No. 3 arrival note;
- No. 4 duplicate consignment note;
- No. 5 duplicate invoice.

For certain important traffics or for certain traffics between adjacent countries, the tariffs may prescribe the use of a simplified form of consignment note adapted to the characteristics of the traffics in question.

The form of consignment note shall be printed on substantial white writing paper. When relating to *grande vitesse* each sheet shall bear two red borders at least one centimetre in width, one on the top edge and the other on the bottom edge, both back and front.

2. The consignment notes shall be printed in two or where necessary in three languages, of which at least one shall be French, German or Italian.

International tariffs or agreements between railways may determine the language in which the portion of the consignment note to be filled in by the sender shall be made out. In the absence of such provisions the sender shall make out these particulars in one of the official languages of the country of departure and attach a translation in French, German or Italian unless the particulars have been made out in one of these languages.

The railway may require that the particulars and declarations to be entered by the sender in the consignment note and in the annexes thereto, shall be in Latin characters.

3. Those parts of the form enclosed within thick lines shall be filled in by the railway and the other parts by the sender. The sender is required to draw a line through spaces which are not used.

4. The choice of the white form of consignment note or of that with red borders indicate whether the goods are to be carried by *petite vitesse* or by *grande vitesse* respectively. A request for *grande vitesse* over one part of the route and *petite vitesse* over the remainder will not be allowed except by agreement between all the railways concerned.

5. Particulars entered in the consignment note shall be written or printed in indelible characters; on the other sheets of the form they must be clearly legible. Consignment notes in which entries have been written over or erased, or those on which pieces of paper have been pasted shall not be accepted. Entries may be struck out on condition that the sender authenticates the striking out by his signature and that, where the number or the weight of the packages is concerned, he inserts the corrected quantities in words.

6. The consignment note shall contain the following particulars:

- (a) The place where and the date on which the consignment note is made out;
- (b) The name of the destination station, with the information necessary to avoid any confusion between different stations serving the same locality or localities of the same or similar names;
- (c) The name and address of the consignee. Only one individual, firm or corporate body shall be shown as consignee. It shall only be permissible to consign to the destination station or to a railway official at the destination station if the

tariff applicable expressly permits this to be done. Addresses not indicating the name of the consignee, such as “to the order of . . .” or “to the holder of the consignment note duplicate” are not allowed;

- (d) A description of the goods, an indication of the weight or, failing that, a similar indication, in accordance with the regulations of the forwarding railway. Where the laws or regulations of the country of departure authorise the sender to consign his goods without mention of the weight or information in lieu thereof, such weight or information shall be entered by the forwarding railway.

The goods shall be described as follows: those specified in Annex I to this Convention, by the name given to them in that Annex; other goods, where the sender requests the application of a particular tariff, by the name given to them in that tariff; and in all other cases by the ordinary commercial description, according to their nature, given to the goods in the country of departure;

- (e) In the case of traffic in less than wagon loads: the number of packages; their individual marks and numbers, or, in their absence, a statement that the packages bear the address of the consignee; a description of the packing. Such information shall also be shown in any consignment note relating to complete wagon loads which comprise one or more articles or packages forwarded by rail-sea and which require to be transhipped.

In the case of consignments where the loading is the duty of the sender: the type of wagon (covered, open, special, or private owner's), the number and marks of ownership of the wagon, and, for privately-owned wagons, the tare;

- (f) A detailed list of the documents which are required by the Customs and other administrative authorities and which are attached to the consignment note or shown as held at the disposal of the railway at a named station or at the office of the Customs or of any other authority;
- (g) The signature of the sender, together with his full name and address and, should he consider it desirable, his telegraphic address or telephone number. The signature may be printed or stamped by the sender if the laws and regulations in force at the forwarding station so permit. Only one individual, firm or corporate body shall be shown in the consignment note as the sender.

7. The consignment note shall in addition contain all other entries provided for in this Convention in so far as they are applicable, and in particular the following:

- (a) The words “to await order” or the words “to be delivered home” on condition that these methods of delivery are permitted at the destination station;
- (b) The tariffs to be applied, and in particular the special or exceptional tariffs provided for in article 11 (4) (c) and in article 35 of this Convention;
- (c) The amount in figures representing interest in delivery declared in accordance with article 20 of this Convention;
- (d) The charges which the sender undertakes to pay in accordance with the provisions of article 17 of this Convention;
- (e) The amount of “cash on delivery” charges, in figures and words, and of disbursements, in figures (article 19 of this Convention);

- (f) The route prescribed in accordance with the provisions of article 10 (1) of this Convention and the designation of the stations at which the formalities required by the Customs and other administrative authorities are to take place;
- (g) Particulars relating to the formalities required by the Customs and other administrative authorities in accordance with the second subparagraph of article 15 (1) of this Convention;
- (h) A statement that the consignee has no right to modify the contract of carriage; this statement shall be inserted in the space headed "Declarations" and shall be worded as follows: "Consignee not authorised to give subsequent orders";
- (i) The number of attendants or the entry "without attendant", in accordance with article 4 (1) (d) (i) of this Convention; this entry must be inserted in the space headed "Declarations".

8. If the space set apart in the consignment note for the particulars to be completed by the sender is insufficient additional sheets shall be used, which shall then become integral parts of the consignment note form. These additional sheets must be of the same format as the consignment note and must be prepared in five copies by means of carbon copying and be dated and signed by the sender. The existence of the additional sheets must be indicated in the consignment note in the space in question. If the total weight of the consignment is indicated this indication must be entered in the consignment note itself.

9. Other declarations in the consignment note shall not be permitted unless they are prescribed or allowed by the laws and regulations of a State or by the tariffs, and are not contrary to this Convention.

The consignment note shall not be replaced by other documents or supplemented by documents other than those prescribed or allowed by this Convention or by the tariffs.

10. A separate consignment note shall be made out for each consignment. Nevertheless, the following goods shall not be consigned under a single consignment note:

- (a) Goods which by reason of their nature cannot be loaded together without detriment;
- (b) Goods which are to be loaded partly by the railway and partly by the sender;
- (c) Goods which cannot be loaded together without contravention of the regulations of the Customs or other administrative authorities;
- (d) Goods accepted for carriage subject to certain conditions, if the goods comprise substances or articles which, by virtue of Annex I to this Convention, may not be loaded together or with other goods.

11. A consignment note may not relate to more than a single wagon load provided that the following goods may be tendered for carriage with a single consignment note:

- (a) Indivisible articles and articles of exceptional dimensions requiring the use of more than one wagon;
- (b) Consignments loaded in several wagons when special arrangements for the traffic in question, or international tariffs, so permit over the whole route.



12. The sender may insert in the consignment note in the space set apart for the purpose, but solely as information for the consignee and without involving the railway in any obligation or liability, remarks relating to the consignment, such as:

- “Sent by . . .”;
- “By order of . . .”;
- “At the disposal of . . .”;
- “To be reconsigned to . . .”;
- “Insured with . . .”;
- “For the . . . Shipping Line or for the ss/mv . . .”;
- “From the . . . Shipping Line or from the ss/mv . . .”;
- “For the . . . road transport service”;
- “From the . . . road transport service”;
- “For the . . . air line”;
- “From the . . . air line”;
- “For export to . . .”.

*Article 7. RESPONSIBILITY FOR STATEMENTS IN THE CONSIGNMENT NOTE.  
MEASURES TO BE TAKEN IN CASE OF OVERLOADING. SURCHARGES*

1. The sender shall be responsible for the correctness of the entries and declarations inserted by him or on his behalf in the consignment note; he shall bear all the consequences resulting from the fact that these entries or declarations may be irregular, incorrect, incomplete, or inserted elsewhere than in the allotted space. Should such space be insufficient the sender shall indicate therein the place in the consignment note where the remainder of the entry will be found.

2. The railway shall always have the right to verify that the consignment corresponds with the particulars entered in the consignment note, and that the safety precautions laid down in Annex I to this Convention have been observed.

If the contents of the consignment are examined for this purpose the sender or the consignee, according to whether the examination takes place at the forwarding station or the destination station, shall be invited to be present. Should the interested party not attend, or should the examination take place in transit, then, unless the laws or regulations of the State where the examination takes place otherwise provide, it shall be carried out in the presence of two witnesses not connected with the railway. The railway shall not be entitled, however, to examine the contents in transit unless compelled to do so by the exigencies of working or by the regulations of the Customs or other administrative authorities.

The result of the examination of the particulars in the consignment note shall be entered therein. If examination takes place at the forwarding station, the actual particulars shall also be entered in the duplicate of the consignment note if it is in the possession of the railway. If the consignment does not correspond with the particulars in the consignment note the charges or expenses occasioned by the examination shall be charged against the goods unless paid at the time.

3. The conditions under which the railway shall be obliged to establish the weight of goods, the number of packages, or the actual tare of wagons, shall be determined by the laws and regulations of each State.

The railway shall be bound to enter in the consignment note the weight, number of packages and actual tare of wagons ascertained upon examination.

4. In the case of weighing on a weighbridge, the weight shall be determined by deducting from the total weight of the loaded wagon the tare indicated on the wagon, unless a different tare results from a special weighing of the empty wagon.

Weights ascertained by a privately-owned weighbridge shall be equivalent to those ascertained by a railway-owned weighbridge, provided that the relevant conditions laid down by the railway concerned have been fulfilled.

5. If weighing by the railway, after the contract of carriage has been made, reveals a difference in weight, the weight ascertained by the forwarding station, or, failing that, the weight declared by the sender, shall in the following cases be the basis of calculation of the carriage charges:

- (a) If the difference is manifestly due to the nature of the goods or to atmospheric conditions;
- (b) If, after the contract of carriage has been made, weighing by the railway takes place on a weighbridge and does not reveal a difference exceeding two per centum of the weight determined by the forwarding station or, failing that, of the weight declared by the sender.

6. When the sender is responsible for loading a consignment he shall comply with the load limit. The provisions laying down load limits shall be published in the same manner as tariffs. If the sender so requests, the railway shall inform him of the permitted load limit.

7. Without prejudice to the right of the railway to recover the difference in carriage charges and to recover compensation for damage which may be suffered, the railway may impose a surcharge in the cases and subject to the conditions specified below:

- (a) In the case of irregular, incorrect or incomplete description of substances and articles not to be accepted for carriage under the provisions of Annex I to this Convention, the surcharge shall be three francs per kilogramme gross weight of the entire package;
- (b) In the case of irregular, incorrect or incomplete description of substances and articles which, under the provisions of Annex I to this Convention, are to be accepted for carriage subject to certain conditions, or in the case of failure to observe the safety measures prescribed in that Annex, the surcharge shall be two francs per kilogramme gross weight of the entire package;
- (c) Where the nature of a consignment comprising goods other than those referred to in sub-paragraphs (a) and (b) of this paragraph is irregularly, incorrectly or incompletely described, or where for any other reason the description of the consignment enables it to be carried at a tariff lower than that which is properly applicable, the surcharge shall be twice the difference between the carriage charges which should have been payable, from the point of departure to the point of destination, had the description been regular,

correct and complete, and those calculated in accordance with the description entered in the consignment note by the sender.

Where a consignment is composed of goods charged at different rates the weights of which can be separately determined without difficulty, the surcharge shall be calculated at the rates respectively applicable to such goods if this method of calculation results in a lower surcharge;

- (d) Where the weight of goods is declared to be less than their actual weight, the surcharge shall be twice the difference between the carriage charges for the declared weight and those for the ascertained weight which are payable from the forwarding station to the destination station. The provision contained in the second paragraph of (c) above shall apply with any necessary modifications;
- (e) In the case of the overloading of a wagon loaded by the sender, the surcharge shall be five times the carriage charges which are payable between the forwarding station and the destination station for the weight in excess of the permitted load limit;
- (f) Should there be, in respect of the same wagon, both an under-declaration of weight and overloading, the surcharges payable in respect thereof shall be cumulative.

8. The surcharge to be collected in accordance with paragraph 7 of this article shall be charged against the goods carried, irrespective of the place where the facts giving rise to the surcharge were established.

9. The amount of the surcharges and the reasons for imposing them shall be entered in the consignment note.

10. The surcharge shall not be due:

- (a) In the case of an incorrect declaration of weight, if the railway is bound to weigh the goods under the regulations in force at the forwarding station;
- (b) In the case of an incorrect declaration of weight or in the case of overloading, if the sender has requested in the consignment note that the railway should weigh the goods;
- (c) In the case of overloading arising in the course of transit from atmospheric conditions, if it is proved that the wagon was not loaded beyond the permitted load limit when made available for carriage at the forwarding station;
- (d) In the case of an increase of weight during transit which does not cause overloading, if it is proved that the increase was due to atmospheric conditions;
- (e) In the case of an incorrect declaration of weight, without there being any overloading, if the difference between the weight indicated in the consignment note and the ascertained weight does not exceed two per centum of the declared weight.

11. When the overloading of a wagon is established by the forwarding station or by an intermediate station the excess load may be removed from the wagon notwithstanding that no surcharge is due. Where necessary the sender shall be invited without delay to state what is to be done with the excess load.

Where, however, a consignee has modified the contract of carriage by virtue of article 22 of this Convention, he shall be notified and invited to give instructions in regard to the excess load.

The excess load shall be charged for the distance carried in accordance with the carriage charges applicable to the main load, together with any surcharge which may be due under paragraph 7 of this article; if the excess load is unloaded, the charge for unloading shall be determined by the tariff of supplementary charges of the railway which carried out the unloading.

If the person entitled to do so directs that the excess load be forwarded to the station to which the main load has been consigned, or to another station, or directs that it be returned to the forwarding station, the excess load shall be treated as a separate consignment.

*Article 8. THE MAKING OF THE CONTRACT OF CARRIAGE. DUPLICATE OF THE CONSIGNMENT NOTE*

1. The contract of carriage shall come into existence as soon as the forwarding railway has accepted the goods for carriage together with the consignment note. The forwarding station shall certify such acceptance by affixing to the consignment note its stamp bearing the date of acceptance.

2. The stamping shall take place immediately after the whole consignment which is the subject of the consignment note has been handed to the railway and such charges as the sender has undertaken to pay have been paid. The stamping shall take place in the presence of the sender if he so requests.

3. When stamped the consignment note shall be evidence of the contract of carriage.

4. In respect of goods to be loaded by the sender under the tariffs or under agreements made with him, if such agreements are authorised at the forwarding station, the particulars in the consignment note relating either to the weight or to the number of packages shall only be evidence against the railway if verification of such weight or number of packages has been made by the railway and certified in the consignment note. If necessary these particulars may be proved by means other than such verification and certification made by the railway in the consignment note.

5. The railway shall certify receipt of the goods and the date of acceptance for carriage by affixing the date stamp on the duplicate of the consignment note, before returning the duplicate to the sender.

The duplicate shall not have effect either as the consignment note accompanying the consignment or as a bill of lading.

*Article 9. TARIFFS. PRIVATE AGREEMENTS*

1. Carriage charges, whether or not calculated separately for different sections of the route, and supplementary charges shall be calculated in accordance with the tariffs which are legally in force and duly published in each State and which are applicable at the time the contract of carriage is made.

The publication of international tariffs shall, however, be compulsory only in those States whose railways participate in such tariffs as railways of departure or destination.

Increases in international tariffs, and any other measures that have the effect of making the conditions of carriage prescribed in such tariffs more onerous, shall not come into force until at least 15 days after their publication, except in the following cases:

- (a) If an international tariff makes provision for the extension of an internal tariff to cover the whole route, the periods for the publication of such internal tariff shall be applicable;
- (b) If increases in the rates contained in an international tariff follow a general increase in the rates contained in the internal tariffs of a participating railway they shall come into force on the day after their publication, on condition that the alteration of the rates contained in the international tariff made necessary by such increase has been announced at least 15 days in advance. Such announcement may not however be prior to the publication of the increase in the internal tariff rates in question;
- (c) If the carriage charges and supplementary charges provided for in the international tariffs have to be amended in order to take account of fluctuations in the rates of exchange, or if obvious errors have to be corrected, such amendments and corrections shall come into force on the day after their publication.

The tariffs shall contain all the information necessary for calculating carriage and supplementary charges, and shall specify where necessary the conditions under which rates of exchange will be taken into account.

2. The tariffs shall indicate all the conditions specially applicable to different types of service and particularly whether they apply to *grande vitesse* or *petite vitesse* service. If for all or certain goods, or between certain points, a railway has a system of tariffs applicable to one type of service only, such tariffs may be applied to goods consigned under either a white or red-bordered consignment note, subject to the conditions as to transit periods applicable to each of such consignment notes under the provisions of article 6 (4) and article 11 of this Convention.

The conditions of the tariffs shall be valid unless contrary to this Convention, in which case they shall be void.

International tariffs may be declared compulsorily applicable in international traffic to the exclusion of the internal tariffs, provided that on average they do not lead to appreciably higher charges than those which would result if the sum of the internal tariffs were applied.

The application of an international tariff may be made conditional upon there being an express request for it in the consignment note.

3. The tariffs shall be applied to all users on the same conditions.

Railways may with the consent of their Governments enter into private agreements for reduced charges or other advantages, provided that comparable conditions are afforded to users in comparable circumstances.

Reductions in charges may be granted for the purpose of railway or public services or for charitable purposes.

Publication of the measures taken by virtue of the second and third subparagraphs above shall not be compulsory.

4. No sum shall be charged by the railways on their own account over and above the carriage and supplementary charges provided for in the tariffs, other than sums disbursed by them, such as customs duties, octroi or police dues, costs of cartage from one station to another which are not shown in the tariff, cost of repairing exterior or interior packing of goods necessary for their preservation, and other similar expenses. Such charges shall be duly noted and entered separately in the consignment note, to which the supporting documents shall be attached. When such charges are to be paid by the sender, the supporting documents shall not be delivered to the consignee with the consignment note, but shall be forwarded to the sender with the account of charges referred to in article 17 (7) of this Convention.

*Article 10. ROUTES AND TARIFFS APPLICABLE*

1. The sender may stipulate in the consignment note the route to be followed, indicating it by reference to frontier points or frontier stations and, where necessary, to transit stations between railways; he may only indicate frontier points and frontier stations which are open to traffic between the forwarding and destination places concerned.

2. The following shall be regarded as routeing instructions:

- (a) Designation of stations where formalities required by Customs and other administrative authorities are to be carried out, and of stations where special care is to be given to the consignment (attention to animals, re-icing, etc.);
- (b) Designation of the tariffs to be applied, if such designation is sufficient to determine the stations between which the tariffs requested are to be applied;
- (c) Instructions as to the payment of the whole or a part of the charges up to X (X indicating by name the point from which the tariffs of neighbouring countries apply).

3. Except in the cases specified in article 5 (4) and (5) and article 24 (1) of this Convention, the railway may not carry the goods by a route other than that indicated by the sender unless:

- (a) The formalities required by Customs and other administrative authorities, as well as the special care to be given to the consignment (attention to animals, re-icing, etc.), will in any event be carried out at the stations indicated by the sender; and
- (b) The charges and the transit periods will not be greater than the charges and transit periods calculated according to the route indicated by the sender.

4. Subject to the provisions of paragraph 3 above, the charges and transit periods shall be calculated according to the route indicated by the sender, or, in the absence of any such indication, according to the route chosen by the railway.

5. The sender may stipulate in the consignment note which tariffs are to be applied. The railway shall be obliged to apply such tariffs if the conditions laid down for their application have been fulfilled.

6. If the instructions given by the sender are not sufficient to indicate the route or tariffs to be applied, or if any of these instructions are inconsistent with one another, the railway shall choose the route or tariffs which appear to it to be the most advantageous to the sender.

The railway shall not be liable for any loss or damage suffered as a result of this choice, except in the case of wilful misconduct or gross negligence.

7. If a through international tariff exists from the forwarding station to the destination station and if, in the absence of sufficient instructions from the sender, the railway has applied this tariff, the railway shall, at the request of the person entitled, reimburse him any difference between the carriage charges thus applied and those which would have resulted had the sum of other tariffs been applied to the same route, but only to the extent that such difference exceeds 10 francs per consignment note.

#### Article 11. TRANSIT PERIODS

1. The transit periods shall be specified either in the regulations in force between the railways participating in the carriage, or in international tariffs applicable from the forwarding station to the destination station. The transit periods so specified shall not exceed those which would result from the application of the provisions of the following paragraphs.

2. In the absence of any indication in regard to transit periods in the regulations or international tariffs as provided in paragraph 1 above, and subject to the provisions of the following paragraphs, the transit periods shall be as follows:

(a) For *grande vitesse*:

- (i) Period for despatch ..... 12 hours;
- (ii) Period for conveyance, for every 300 km.\* or fraction of 300 km. of distance to which the tariffs apply ..... 24 hours;

(b) For *petite vitesse*:

- (i) Period for despatch ..... 24 hours;
- (ii) Period for conveyance, for every 200 km.\*\* or fraction of 200 km. of distance to which the tariffs apply ..... 24 hours.

3. The period for conveyance shall be calculated on the total distance between the forwarding station and the destination station; the period for despatch shall be counted only once, irrespective of the number of systems traversed.

4. The laws and regulations of each State shall determine to what extent the railways shall be entitled to fix additional transit periods in the following cases:

(a) For consignments handed in for carriage at places other than stations or for consignments to be delivered at such places;

(b) For consignments requiring carriage:

By sea or inland navigable waterways by ferry or ship,

By a land route not served by rail,

By certain junction lines connecting two lines of the same system or of different systems,

By a secondary line, or

\* Approximately 186 miles.

\*\* Approximately 124 miles.

By a line which is not of standard gauge;

- (c) For consignments charged at reduced rates in accordance with special and exceptional internal tariffs;
- (d) In exceptional circumstances causing:
  - Either an exceptional increase in traffic, or
  - Exceptional operating difficulties.

5. Any additional transit period under paragraph 4 (a), (b) and (c) above shall be shown in the tariffs.

Any additional transit period under paragraph 4 (d) above shall be published and shall not come into force before it has been published.

6. The transit period shall run from midnight next following acceptance of the goods for carriage by the railway as provided in article 8 (1) of this Convention. In the case, however, of traffic consigned *grande vitesse*, the period shall start 24 hours later if the day which follows the day of acceptance for carriage is a Sunday or a legal holiday, unless the forwarding station is open for *grande vitesse* traffic on Sundays or legal holidays.

7. The transit period shall be suspended:

- (a) For all consignments, except in the case of wrongful act or neglect by the railway, during the period of delay necessitated by:
  - (i) Examination in accordance with article 7 (2) and (3) of this Convention, which reveals differences from the information shown in the consignment note;
  - (ii) The carrying out of the formalities required by Customs and other administrative authorities;
  - (iii) Modifications of the contract of carriage under article 21 or article 22 of this Convention;
  - (iv) Special care to be given to the consignment (attention to animals, re-icing, etc.);
  - (v) Any interruption of traffic temporarily preventing the beginning or continuation of carriage;
- (b) For *petite vitesse* consignments on Sundays and legal holidays;
- (c) For *grande vitesse* consignments on Sundays and certain legal holidays if, in any State, the laws or regulations provide for the total or partial interruption of transport by *grande vitesse* on those days.

The reason for and the duration of the suspension of the transit period provided for under (a) shall be entered in the consignment note. If necessary these suspensions of the transit period may be proved by means other than by the particulars entered in the consignment note.

8. When the transit period terminates after the time at which the destination station closes, the period shall be extended until 2 hours after the time at which the station next opens.

In addition, in the case of *grande vitesse* consignments, if the transit period ends on a Sunday or a holiday as defined in paragraph 7 (c) above, this period shall be extended until the same time on the next working day.



9. The requirements as to the transit period shall be deemed to have been met if, before its expiry:

- (a) In the case where consignments are to be delivered at a station and notice of arrival must be given, such notice is given and the goods are held at the disposal of the consignee;
- (b) In the case where consignments are to be delivered at a station and notice of arrival need not be given, the goods are held at the disposal of the consignee;
- (c) In the case of consignments which are to be delivered to some place other than a station, the goods are placed at the disposal of the consignee.

#### *Article 12.* CONDITION OF THE GOODS. PACKING

1. When the railway accepts for carriage goods showing manifest signs of damage, it may require the condition of such goods to be specially indicated in the consignment note.

2. When the nature of the goods is such as to require packing, the sender shall so pack them as to preserve them from total or partial loss or damage in transit and to avoid risk of damage to persons, equipment or other goods.

The packing shall also conform to the provisions of the tariffs and the regulations of the forwarding railway.

3. If the sender has not complied with the provisions of paragraph 2 above the railway may either refuse the consignment or require the sender to acknowledge in the consignment note the absence or defective condition of packing, with an exact description thereof.

4. The sender shall be liable for all the consequences of the absence of packing or of its defective condition. In particular, he shall be required to make good any loss or damage suffered by the railway from this cause. If the consignment note contains no mention of the absence or defective condition of packing the burden of proof of such absence or defect shall rest upon the railway.

5. When a sender habitually despatches from the same station goods of the same nature requiring packing, and habitually presents them either without packing or with similar defective packing, he need not comply with the provisions of paragraph 3 above in respect of each consignment if he deposits at that station a general declaration in the form set out in Annex III to this Convention. In such cases a reference to the general declaration deposited at the forwarding station shall be included in the consignment note.

6. Unless otherwise provided in the tariffs, the sender shall, in the case of consignments of less than wagon loads, indicate on each package in a clear and indelible manner which will avoid confusion and correspond exactly with the details in the consignment note:

- (a) Marks and numbers or, failing that, the address of the consignee;
- (b) The destination station.

If the regulations applicable to the forwarding railway so require, the name and address of the consignee shall be shown either on the outside or within a folded label which may only be opened if the consignment note is missing.

The information required under (a) and (b) above shall also be shown on each article or package comprised in a complete wagon load which, when forwarded by rail and sea, requires to be transhipped.

Old marks or labels shall be obliterated or removed by the sender.

7. Unless otherwise provided in the tariffs, fragile articles (such as glassware, china and pottery), goods which can become scattered in wagons (such as nuts, fruit, fodder, stones), and also goods which can taint or damage other packages (such as coal, lime, cinders, ordinary earth, coloured earths) shall not be carried otherwise than in complete wagon loads, unless packed or fastened together in such a manner that they cannot become broken or lost, or taint or damage other packages.

*Article 13.* DOCUMENTS TO BE FURNISHED FOR FORMALITIES REQUIRED BY THE CUSTOMS AND OTHER ADMINISTRATIVE AUTHORITIES. CUSTOMS SEALS

1. The sender shall attach to the consignment note the documents necessary for the completion of formalities required by the Customs and other administrative authorities before delivery of the goods to the consignee. Such documents shall relate only to goods which are the subject of one and the same consignment note, unless otherwise provided by regulations, or Government orders, or by tariffs.

When these documents cannot be attached to the consignment note, the sender shall ensure their delivery in sufficient time to the station, customs office or office of any other authority where the formalities are to be completed; the office at which such documents will be held at the disposal of the railway shall be indicated in the consignment note.

2. The railway shall not be obliged to verify the correctness and sufficiency of the documents furnished.

The sender shall be liable to the railway for any loss or damage resulting from the absence or insufficiency or of any irregularity in such documents, except in the case of wrongful act or neglect by the railway.

The railway, in the case of any wrongful act or neglect on its part, shall be liable for any consequences arising out of the loss, non-use or misuse of the documents referred to in the consignment note and accompanying that document or deposited with the railway; provided that the compensation payable by the railway shall not exceed that payable in the event of loss of the goods.

3. The sender shall comply with the customs regulations as to the packing and sheeting of the goods. The railway may refuse consignments bearing a damaged or defective customs seal.

If the sender has not packed or sheeted the goods in compliance with the customs regulations, the railway shall be entitled to do so. The cost shall be charged against the goods.

**Chapter II. PERFORMANCE OF THE CONTRACT OF CARRIAGE**

*Article 14.* HANDING OF GOODS TO THE RAILWAY FOR CARRIAGE, AND LOADING OF GOODS

1. The handing of goods to the railway for carriage shall be governed by the laws and regulations in force at the forwarding station.

2. Loading shall be the duty of the railway or the sender according to the regulations in force at the forwarding station, unless otherwise provided in this Convention or unless the consignment note includes a reference to a special agreement between the sender and the railway.

If loading is carried out by the sender he shall be liable for all the consequences of faulty loading. In particular he shall make good any loss or damage which the railway may have suffered from such faulty loading. The burden of proof of faulty loading shall rest upon the railway.

3. Unless otherwise provided in this Convention, goods shall be conveyed in covered wagons, open wagons, wagons specially fitted, or sheeted open wagons according to the provisions of the relevant international tariffs. If there are no relevant international tariffs, or if such tariffs do not contain any provisions on the subject, the regulations in force at the forwarding station shall apply throughout the whole of the route.

*Article 15. FORMALITIES REQUIRED BY THE CUSTOMS AND OTHER ADMINISTRATIVE AUTHORITIES*

1. In transit, the formalities required by the Customs and other administrative authorities shall be completed by the railway which may, at its own discretion, either delegate this duty to an agent or do the work itself. In either case the obligations of the railway shall be those of an agent.

The sender by so indicating in the consignment note, or the consignee by giving instructions as provided for in article 22 of this Convention may, however, ask:

- (a) To be present himself or to be represented by an agent at the carrying out of the formalities referred to in the preceding sub-paragraph for the purpose of furnishing any information or explanations required;
- (b) If and to the extent permitted by the laws and regulations of the country in which the formalities required by the Customs or other administrative authorities are to be carried out, to complete such formalities himself or to have them completed by an agent and, if necessary, effect payment of customs duty and other expenses.

Neither the sender, nor the consignee who has the right of disposal, nor the agent of either shall have any right to take possession of the goods.

If for the completion of the formalities required by the Customs or other administrative authorities the sender has designated a station where the regulations in force do not permit of the completion of such formalities, or if he has indicated for this purpose any other procedure which cannot be followed, the railway shall act in the manner which appears to it to be most favourable to the interests of the party concerned and shall inform the sender of the measures taken.

If the sender has inserted in the consignment note an entry that he is responsible for charges which include customs duty the railway shall have the choice of carrying out customs formalities either in course of transit or at the destination station.

2. Subject to the exception contained in the final sub-paragraph of paragraph 1 of this article the consignee shall be entitled to carry out customs formalities at the destination station if that station has a customs office and the consign-

ment note provides for customs clearance on arrival, or if, in the absence of such provision, the goods arrive under customs control. If the consignee exercises this right he shall pay in advance the charges due on the consignment.

If the consignee does not take possession of the consignment note within the period fixed by the regulations in force at the destination station, the railway may proceed in the manner indicated in paragraph 1 of this article.

#### *Article 16. DELIVERY*

1. The railway shall deliver the consignment note and the goods to the consignee at the destination station against a receipt and payment of the amounts chargeable to the consignee by the railway.

Acceptance of the consignment note renders the consignee liable to pay to the railway the amounts chargeable to him.

2. It shall be equivalent to delivery of the goods to the consignee if they have been handed over, in accordance with the provisions in force, to the Customs or revenue authorities at their premises or warehouses, when these are not in the care of the railway, or if they have been deposited for storage with the railway, a forwarding agent or a warehouseman.

3. The laws and regulations in force at the destination station shall determine whether the railway is entitled or obliged to convey the goods to the address of the consignee. If the railway conveys the goods, or procures their conveyance, to the address of the consignee, delivery shall only be deemed to have been effected at the time when they are so delivered.

4. After the arrival of the goods at the destination station, the consignee shall be entitled to require the railway to deliver to him the consignment note and the goods. If the loss of the goods is established or if the goods have not arrived after the expiry of the period provided for in article 30 (1) of this Convention, the consignee shall be entitled to enforce in his own name against the railway any rights he may have acquired by reason of the contract of carriage.

5. The person entitled to delivery may refuse to accept the goods even when he has received the consignment note and paid the charges if and so long as an examination for which he has asked in order to verify alleged damage has not been made.

6. In all other respects, delivery of goods shall be carried out in accordance with the laws and regulations of the country of destination.

#### *Article 17. PAYMENT OF CHARGES*

1. The charges (carriage charges, supplementary charges, customs duties and other charges incurred from the time of acceptance for carriage to the time of delivery) shall be paid by the sender or the consignee in accordance with the following provisions.

In applying these provisions, charges which, according to the applicable tariff, are to be added to the standard rates or exceptional rates in calculating the carriage charges, shall be deemed to be carriage charges.

2. A sender who undertakes to pay all or part of the charges shall indicate accordingly in the consignment note in the space provided for the purpose as follows:

- (a) “*Franco de tous frais*”, if he undertakes to pay all charges of every kind (carriage charges, supplementary charges, customs duties and other charges);
- (b) “*Franco de tous frais, à l’exception de . . .*” (exact description of the charges which he does not undertake to pay), if he undertakes to pay all charges subject to the exceptions exactly indicated;
- (c) “*Franco*”, if he undertakes to pay all carriage charges and in addition all supplementary charges which, according to the regulations and internal tariffs in force in the forwarding country or, as the case may be, according to the rates of the international tariff which has been applied, can be raised by the forwarding station, at the time the goods are handed in for carriage;
- (d) “*Franco y compris . . .*”, if he undertakes to pay charges additional to those referred to in (c); in which case he shall give an exact description of those charges;
- (e) “*Franco de port*”, if he undertakes to pay carriage charges only;
- (f) “*Franco de douane*”, if he undertakes to pay all sums collected by the Customs authorities from the railway, in addition to the supplementary and other charges which the railway makes for customs clearance;
- (g) One of the indications provided for above, completed by the words: “. . . up to X” (X indicating by name the point at which the tariffs applied by adjacent countries take effect), if he undertakes to pay all or part of the charges up to X, but excluding all charges relating to the subsequent country or railway;
- (h) “*Franco pour . . .*”, if he undertakes to pay a fixed amount. This amount shall be shown in words; it shall be expressed in the currency of the forwarding country except when provision is made to the contrary in the tariffs.

The sender may enter in the same consignment note several of the above indications, if they are compatible with one another.

Supplementary charges and other charges which, according to the regulations and internal tariffs of the forwarding country or, as the case may be, according to the rates of the international tariff which has been applied, are to be calculated for the whole of the route over which the charges apply, and the charge for interest in delivery laid down in article 20 (2) of this Convention, shall always be paid in full by the sender, in the case of payment of the charges in accordance with (g) combined with one of the indications set out in (a), (b), (c) or (d).

3. The international tariffs may, as regards payment of charges, prescribe the exclusive use of certain indications set out in paragraph 2 of this article or the use of other indications.

4. Charges which the sender has not undertaken to pay shall be deemed to be payable by the consignee, provided that such charges shall be payable by the sender if the consignee has not taken possession of the consignment note, nor exercised his rights under article 16 (4) of this Convention, nor modified the contract of carriage in accordance with article 22 of this Convention.

5. Supplementary charges, such as charges for demurrage, warehousing and weighing, which arise out of an act for which the consignee is responsible or out of a request which he has made, shall be paid by him.

6. The forwarding railway may require the sender to prepay the charges in the case of goods which in its opinion are liable to rapid deterioration or which,

by reason of their low value or their nature, do not provide sufficient cover for such charges.

7. If the amount of the charges which the sender undertakes to pay cannot be ascertained exactly at the time the goods are handed in for carriage the railway may require as security a deposit approximating to the amount of such charges for which a receipt shall be given. Such charges shall be entered in a recharge note and a settlement of accounts shall be made with the sender not later than 30 days after the expiry of the transit period. A detailed statement of charges as set out in the recharge note shall be delivered to the sender in return for the receipt.

8. The forwarding station shall specify, both in the consignment note and in the duplicate, the amount of the charges paid or undertaken to be paid at the forwarding station unless the instructions or tariffs in force at the forwarding station provide that these charges need only be specified in the duplicate. In the cases provided for in paragraph 7 of this article these charges are to be specified neither in the consignment note nor in the duplicate.

#### *Article 18.* CORRECTION OF CHARGES

1. In the case of incorrect application of a tariff or of error in determining or collecting charges, overcharges shall be refunded by the railway and undercharges paid to the railway.

2. Overcharges discovered by the railway shall forthwith be brought to the notice of the person concerned if they exceed 1 franc per consignment note and settled as soon as possible.

3. If the consignee has not taken possession of the consignment note the sender shall be responsible for payment to the railway of any amounts undercharged. When the consignment note has been accepted by the consignee or when the contract of carriage has been modified as provided in article 22 of this Convention, the sender shall be responsible for payment of an undercharge only in so far as it relates to the charges which he has undertaken to pay by his declaration in the consignment note: any balance of the undercharge shall be paid by the consignee.

4. If the sums due under this article exceed 10 francs per consignment note they shall bear interest at five per centum per annum.

Such interest shall be calculated from the date of the demand for payment or from the date of the claim referred to in article 41 of this Convention or, if there has been no such demand or claim, from the date of the institution of legal proceedings.

#### *Article 19.* "CASH ON DELIVERY" CHARGES AND DISBURSEMENTS

1. The sender may make the consignment subject to a "cash on delivery" charge not exceeding the value of the goods. Such charge shall be expressed in the currency of the country of departure but the tariffs may provide for exceptions.

2. The railway shall not be obliged to pay "cash on delivery" charges until the amount thereof has been received from the consignee. The amount shall be placed at the sender's disposal within thirty days of payment by the consignee; in case of delay interest at five per centum per annum shall be due from the date of the expiry of that period.

3. If the goods are delivered, in whole or in part, to the consignee without previous collection of the “cash on delivery” charge, the railway shall pay to the sender the amount of any loss sustained by him not exceeding the amount of such charge without prejudice to the right of action of the railway against the consignee.

4. If the goods are consigned subject to a “cash on delivery” charge the railway shall be entitled to charge the collection fee laid down in the tariffs; such fee shall be payable notwithstanding that the “cash on delivery” charge may be cancelled or reduced by modification of the contract of carriage (article 21 (1) of this Convention).

5. Disbursements shall only be allowed if made in accordance with the regulations in force at the forwarding station.

#### *Article 20. DECLARATION OF INTEREST IN DELIVERY*

1. Any consignment may be the subject of a declaration of interest in delivery entered in the consignment note in accordance with article 6 (7) (c) of this Convention.

The amount declared shall be shown in the currency of the country of departure, in gold francs, or in such other currency as may be determined by the tariffs.

2. The charge for interest in delivery shall be calculated for the whole of the route concerned, in accordance with the tariffs of the forwarding railway.

### Chapter III. *MODIFICATION OF THE CONTRACT OF CARRIAGE*

#### *Article 21. RIGHT OF THE SENDER TO MODIFY THE CONTRACT OF CARRIAGE*

1. The sender shall be entitled to modify the contract of carriage by giving orders that:

- (a) The goods are to be withdrawn at the forwarding station;
- (b) The goods are to be stopped in transit;
- (c) Delivery of the goods is to be delayed;
- (d) The goods are to be delivered to a person other than the consignee shown in the consignment note;
- (e) The goods are to be delivered at a station other than the destination station shown in the consignment note, or that they are to be returned to the forwarding station; in which case the sender may require that a consignment forwarded initially by *petite vitesse* shall be reforwarded by *grande vitesse* or *vice versa* if the station where the consignment has been stopped provides both kinds of service; the sender may also indicate the tariff to be applied and the route to be followed.

Unless otherwise provided in the tariffs of the forwarding railway, requests for modification of the contract of carriage shall also be accepted when their purpose is:

- (f) Making the consignment subject to a “cash on delivery” charge;
- (g) The increase, decrease or cancellation of a “cash on delivery” charge;

(h) The undertaking to pay charges relating to a consignment which has not been prepaid or the increase of charges, undertaken in accordance with the provisions of article 17 (2) of this Convention.

Orders other than those enumerated above shall not be accepted. International tariffs may, however, entitle the sender to modify the contract of carriage by giving orders in addition to those indicated above.

Orders shall not be accepted if compliance with them would result in a division of the consignment.

2. The subsequent orders referred to above shall be given by means of a written declaration in the form set out in Annex IV (a) to this Convention.

Such declaration shall be reproduced and signed by the sender in the duplicate of the consignment note which shall be presented to the railway at the same time. The forwarding station shall certify that the subsequent order has been received by affixing its date stamp on the duplicate note below the declaration made by the sender. This duplicate shall then be returned to him. A railway complying with a sender's orders without requiring production of such duplicate shall be liable for any loss or damage thereby caused to the consignee if the duplicate has been delivered to him by the sender.

If the sender requests the increase, decrease or cancellation of a "cash on delivery" charge, he shall produce the document which was originally delivered to him. In the case of increase or decrease of the "cash on delivery" charge, such document shall be returned to the person concerned after correction; it shall be surrendered by that person in the event of cancellation of the charge.

Any subsequent orders given by the sender in a form other than that prescribed shall be void.

3. No railway shall carry out subsequent orders given by the sender unless they are transmitted through the forwarding station.

If the sender so requests, the destination station or the station at which the consignment is to be stopped shall be notified, at the expense of the sender, by telegram or telephone message sent by the forwarding station and confirmed in writing. Unless otherwise provided in the international tariff or other agreements between the railways concerned, the destination station or the station at which the consignment is to be stopped shall carry out the subsequent order, without awaiting confirmation, when the telegram or telephone message originates from the forwarding station, which shall be verified in case of doubt.

4. The sender's right to modify the contract of carriage shall, notwithstanding that he is in possession of the duplicate of the consignment note, cease when one of the following cases applies:

- (a) When the consignee has taken possession of the consignment note;
- (b) When the consignee has exercised his right under the contract of carriage in accordance with article 16 (4) of this Convention;
- (c) When the consignment has entered the customs territory of the country of destination, provided that the consignee is entitled, in accordance with article 22 of this Convention, to give orders.

After the sender's right to modify the contract of carriage has ceased to exist, the railway shall comply with the orders of the consignee.



*Article 22.* RIGHT OF THE CONSIGNEE TO MODIFY THE CONTRACT OF CARRIAGE

1. The consignee shall be entitled to modify the contract of carriage if the sender has not undertaken to pay the charges relating to carriage in the country of destination, and has not inserted in the consignment note the indication provided for in article 6 (7) (*h*) of this Convention.

Any orders which the consignee may give shall have effect only when the consignment has entered the customs territory of the country of destination.

The consignee may give orders that:

- (a) The goods are to be stopped in transit;
- (b) Delivery of the goods is to be delayed;
- (c) The goods are to be delivered in the country of destination to a person other than the consignee shown in the consignment note;
- (d) The formalities required by Customs and other administrative authorities shall be carried out in accordance with one of the methods set out in the second sub-paragraph of article 15 (1) of this Convention.

In addition, unless provision is made to the contrary in international tariffs, the consignee may give orders that:

- (e) The goods are to be delivered in the country of destination at a station other than the destination station indicated in the consignment note. In that event, he may direct that a consignment sent initially by *petite vitesse* shall be reforwarded by *grande vitesse* or *vice versa* if the station where the consignment has been stopped provides both kinds of service. He may also indicate the tariff to be applied and the route to be followed.

Orders other than those enumerated above shall not be accepted. International tariffs may, however, entitle the consignee to modify the contract of carriage by giving orders in addition to those indicated above.

Orders shall not be accepted if compliance with them would result in a division of the consignment.

2. The orders referred to above shall be given by addressing, either to the destination station or to the station of entry into the country of destination, a written declaration in the form set out in Annex IV (*b*) to this Convention.

Any order given by the consignee in a form other than that prescribed shall be void.

It shall not be necessary for the consignee to produce the duplicate of the consignment note in order to exercise his right to modify the contract of carriage.

3. If the consignee so requests, the station which has received the order shall send it, at the expense of the consignee, by telegram or telephone message, confirmed in writing, to the station which is to carry out the order; the station shall carry out the order, without awaiting confirmation, when the telegram or telephone message originates from the competent station, which shall be verified in case of doubt.

4. The consignee's right to modify the contract of carriage shall cease in any of the following cases:

- (a) When he has taken possession of the consignment note;

- (b) When he has exercised his rights under the contract of carriage in accordance with article 16 (4) of this Convention;
- (c) When the person designated by him in accordance with sub-paragraph 1 (c) of this article has taken possession of the consignment note or exercised his rights in accordance with article 16 (4) of this Convention.

5. If the consignee has given orders for delivery of the goods to another person, that person shall not be entitled to modify the contract of carriage.

#### *Article 23. THE CARRYING OUT OF SUBSEQUENT ORDERS*

1. The railway shall not refuse to give effect to orders given under articles 21 and 22 of this Convention or delay doing so unless:

- (a) It is no longer possible to give effect to the orders by the time they reach the station responsible for doing so;
- (b) Compliance with the orders would interfere with normal railway working;
- (c) The order is to change the destination station and to carry it out would contravene the laws and regulations in force in one of the territories to be traversed, and in particular the requirements of the Customs and other administrative authorities;
- (d) The order is to change the destination station, and the value of the goods will not, as far as can be foreseen, cover all the charges which will be payable on the consignment on its arrival at the new destination, and the amount of such charges is not immediately paid or guaranteed.

In the foregoing cases, the person who has given the subsequent orders shall be informed as soon as possible of the circumstances which prevent compliance with those orders.

If any such circumstances should arise which the railway is not in a position to foresee at the time compliance with the subsequent orders commences, the person who has given the orders shall be liable for all consequences resulting from such commencement.

2. If it is laid down in the subsequent orders that the goods are to be delivered to an intermediate station, carriage shall be charged from the forwarding station to such intermediate station. If, however, the goods have already been carried beyond that intermediate station, carriage shall be charged from the forwarding station to the station at which the goods are stopped and from that station back to the intermediate station.

If it is laid down in the subsequent orders that the goods are to be carried to a different destination station or returned to the forwarding station, carriage shall be charged from the forwarding station to the station at which the goods are stopped and from that station to the new destination station or back to the forwarding station as the case may be.

The tariffs applicable shall be those in force for each section of the route on the day on which the contract of carriage is made.

The above provisions shall apply to supplementary charges and other charges with any necessary modifications.

3. The charges arising from the carrying out of an order by the sender or the consignee, except those arising out of the wrongful act or neglect of the railway, shall be charged against the goods.

4. Subject to the provisions of paragraph 1 above the railway, in the case of any wrongful act or neglect on its part, shall be liable for the consequences of failing to carry out or of improperly carrying out instructions given under articles 21 or 22 of this Convention, provided that compensation payable by the railway shall not exceed that which would be payable for loss of the goods.

#### *Article 24.* CIRCUMSTANCES PREVENTING CARRIAGE

1. When circumstances prevent carriage of the goods, it shall rest with the railway to decide whether it is advisable in the sender's interest to ask him for instructions, or whether it is preferable to carry the goods on its own initiative by an alternative route. Unless there is a wrongful act or neglect on its part the railway shall be entitled to recover the carriage charges applicable to the route over which the goods are carried, and shall be allowed the transit periods applicable to such route, even if longer than those applicable to the original route.

2. If there is no alternative route, or if for other reasons it is impossible to continue carrying the goods, the railway shall ask the sender for instructions but shall not be obliged to do so in the event of carriage being temporarily prevented by circumstances referred to in article 5 (4) of this Convention.

3. The sender may enter in the consignment note instructions to be observed in the event of circumstances preventing carriage.

If, in the opinion of the railway, such instructions cannot be carried out, the railway shall ask the sender for further instructions.

4. The sender, on being notified of any circumstance preventing carriage, may give instructions either to the forwarding station or to the station where the goods are for the time being situated. If he changes the consignee or the destination station or gives instructions to a station other than the forwarding station, he shall enter his instructions in the duplicate of the consignment note, which shall be produced.

If the railway gives effect to the sender's instructions without having required production of the duplicate of the consignment note, and if that duplicate has been sent or handed to the person previously designated as consignee, the railway shall be liable to that person for any resulting loss or damage.

5. If on being notified of a circumstance preventing carriage the sender does not within a reasonable time give instructions which can be carried out, action shall be taken in accordance with the regulations relating to the action to be taken when delivery is prevented which are in force on the railway on which the goods have been held up.

If the goods have been sold, the proceeds of sale, less any expenses chargeable against the goods, shall be held at the disposal of the sender. If such proceeds are less than the expenses chargeable against the goods the sender shall pay the difference.

6. If the circumstances preventing carriage cease to exist before the arrival of instructions from the sender, the goods shall be forwarded to their

destination without waiting for such instructions and the sender shall be notified to that effect as soon as possible.

7. If the circumstances preventing carriage arise after the consignee has modified the contract of carriage under article 22 of this Convention, the railway shall notify such consignee to whom the provisions of paragraphs 1, 2, 5 and 6 above shall apply with any necessary modifications. He shall not be obliged to produce the duplicate of the consignment note.

8. The provisions of article 23 of this Convention shall apply to carriage undertaken in compliance with this Article.

#### *Article 25. CIRCUMSTANCES PREVENTING DELIVERY*

1. When circumstances prevent delivery of the goods, the destination station shall without delay notify the sender through the forwarding station, and ask for his instructions. The sender shall be notified direct, either in writing or by telegram, if he has so requested in the consignment note. The expense of such notification shall be charged against the goods.

If the circumstances preventing delivery cease to exist before the arrival at the destination station of instructions from the sender the goods shall be delivered to the consignee. Notification of such delivery shall be given without delay to the sender by registered letter; the expense of such notification shall be charged against the goods.

If the consignee refuses the goods, the sender shall be entitled to give instructions even if he is unable to produce the duplicate of the consignment note.

The sender may also request in the consignment note that the goods shall be returned to him without further instructions in the event of circumstances preventing delivery. Unless such request is made, the goods may not be returned to the sender without his express consent.

Unless the tariffs otherwise provide, the sender's instructions shall be given through the forwarding station.

2. Except as otherwise provided in paragraph 1 of this article and subject to the provisions of article 45 of this Convention, the procedure in the event of circumstances preventing delivery shall be determined by the laws and regulations in force on the railway responsible for delivery.

If the goods have been sold the proceeds of sale, less any expenses chargeable against the goods, shall be held at the disposal of the sender. If the proceeds are less than the expenses chargeable against the goods the sender shall pay the difference.

3. If the circumstances preventing delivery arise after the consignee has modified the contract of carriage in accordance with article 22 of this Convention, the railway shall notify such consignee, to whom the second sub-paragraph of 2 above shall apply with any necessary modifications.

4. The provisions of article 23 of this Convention shall apply to carriage undertaken in compliance with this article.

## PART III. LIABILITY. LEGAL PROCEEDINGS

## Chapter I. LIABILITY

*Article 26.* COLLECTIVE RESPONSIBILITY OF RAILWAYS

1. The railway which has accepted goods for carriage with the consignment note shall be responsible for ensuring that carriage is effected over the entire route up to delivery.

2. Each succeeding railway, by the act of taking over the goods with the original consignment note, shall participate in the performance of the contract of carriage in accordance with the terms of that document, and shall be subject to the resulting obligations. Nothing in this paragraph shall derogate from the provisions of article 43 (3) of this Convention relating to the railway of destination.

*Article 27.* EXTENT OF LIABILITY

1. The railway shall be liable for exceeding the transit period, for total or partial loss of the goods, and for damage thereto occasioned between the time of acceptance for carriage and the time of delivery.

2. The railway shall, however, be relieved of liability if the exceeding of the transit period or the loss or damage was caused by the wrongful act or neglect of the claimant, by the instructions of the claimant given otherwise than as a result of the wrongful act or neglect on the part of the railway, by inherent vice of the goods (decay, wastage, etc.) or through circumstances which the railway could not avoid and the consequences of which it was unable to prevent.

3. The railway shall be relieved of liability when the loss or damage arises out of the special risks inherent in one or more of the following circumstances:

- (a) Carriage in open wagons under the conditions applicable thereto or by an agreement made with the sender and referred to in the consignment note;
- (b) The absence or inadequacy of packing in the case of goods which, by their nature, are liable to wastage or to be damaged when not packed or when not properly packed;
- (c) Loading operations carried out by the sender or unloading operations carried out by the consignee under the conditions applicable thereto, or by agreement made with the sender and referred to in the consignment note, or by agreement with the consignee;  
Faulty or improper loading when performed by the sender under the conditions applicable thereto or by agreement made with the sender and referred to in the consignment note;
- (d) The carrying out by the sender, the consignee or the agent of either, of the formalities required by the Customs or other administrative authorities;
- (e) The nature of certain kinds of goods which particularly exposes them to total or partial loss or to damage, especially through breakage, rust, decay, desiccation or leakage;
- (f) The forwarding under irregular, incorrect or incomplete description of articles which are not to be accepted for carriage; the forwarding under irregular, incorrect or incomplete description of articles accepted only subject to certain

conditions, or the failure on the part of the sender to observe the prescribed precautions in respect of such articles;

- (g) The carriage of livestock;
- (h) The carriage of consignments which, under this Convention, or under the conditions applicable or by special agreement made with the sender and referred to in the consignment note, must be accompanied by an attendant, in so far as the risks are those which it is the purpose of the attendant to avert.

#### *Article 28. BURDEN OF PROOF*

1. The burden of proving that loss, damage or exceeding of the transit period was due to one of the causes specified in article 27 (2) of this Convention shall rest upon the railway.

2. When the railway establishes that, in the circumstances of the case, the loss or damage could be attributed to one or more of the special risks referred to in article 27 (3) of this Convention, it shall be presumed that it was so caused. The claimant shall, however, be entitled to prove that the loss or damage was not, in fact, attributable either wholly or partly to one of these risks.

This presumption shall not apply in the circumstances envisaged in article 27 (3) (a) of this Convention if there has been an abnormal shortage, or a loss of any package.

#### *Article 29. PRESUMPTION IN THE CASE OF RECONSIGNMENT*

1. When a consignment despatched subject to the provisions of this Convention has been reconsigned also subject to those provisions and partial loss or damage has been discovered after the reconsignment, it shall be presumed that such loss or damage occurred during the last contract of carriage if the following conditions are satisfied:

- (a) The consignment remained in the care of the railway during the whole period;
- (b) The consignment was reconsigned in the same condition as it arrived at the station from which it was reconsigned.

2. The same presumption shall exist when the contract of carriage before the reconsignment was not subject to this Convention if the Convention could have been applied in the case of a through consignment from the original forwarding station to the final destination station.

#### *Article 30. PRESUMPTION OF LOSS OF GOODS. POSITION IF SUBSEQUENTLY RECOVERED*

1. The person entitled to make a claim for the loss of goods may, without being required to furnish further proof, treat goods as lost when they have not been delivered to the consignee, or are not being held at his disposal within thirty days after the expiry of the transit periods.

2. The person so entitled may, on receipt of compensation for the missing goods, request in writing that he shall be notified without delay should the goods be recovered in the course of the year following the payment of compensation. He shall be given a written acknowledgment of such request.

3. Within the thirty days following receipt of such notification, the person entitled as aforesaid may require the goods to be delivered to him at any station on the route, against payment of the charges arising on the consignment note from the forwarding station to the station where delivery is made and also against refund of the compensation he received, less any charges included therein but without prejudice to any claims to compensation for exceeding the transit period under article 34 of this Convention and, where applicable, article 36 of this Convention.

4. In the absence of the request mentioned in paragraph 2 above or of any instructions given within the period of thirty days specified in paragraph 3 above, or if the goods are not recovered until more than one year after the payment of compensation, the railway shall be entitled to dispose of them in accordance with the laws and regulations of the State to which the railway belongs.

*Article 31. AMOUNT OF COMPENSATION FOR LOSS OF GOODS*

1. When, under the provisions of this Convention, a railway is liable for compensation in respect of total or partial loss of goods, such compensation shall be calculated:

According to the commodity exchange price, or,

If there is no such price, according to the current market price, or

If there is no commodity exchange price or current market price, by reference to the normal value.

These bases of calculation shall refer to goods of the same kind and quality at the place and time at which the goods were accepted for carriage.

Compensation shall not, however, exceed 100 francs per kilogramme of gross weight short subject to the limits imposed by article 35 of this Convention.

In addition, carriage charges, customs duties and other expenses paid in respect of the missing goods shall be refunded, but no further damages shall be payable.

2. When the amounts on which these calculations are based are not expressed in the currency of the State in which payment is claimed, conversion shall be at the rate of exchange applicable on the day and at the place of payment of compensation.

*Article 32. LIMITATION OF LIABILITY FOR WASTAGE IN TRANSIT*

1. In respect of goods which, by reason of their nature, are generally subject to wastage in transit by the sole fact of carriage, the railway shall only be liable to the extent that the wastage exceeds the following allowances, whatever the length of the route:

(a) Two per centum of the weight for liquid goods or goods consigned in a moist condition, and also for the following goods:

Bark	Fruit, fresh, dried or cooked
Bones, whole or ground	Furs
Coal and coke	Hide cuttings
Dye woods, grated or ground	Hides
Fats	Hog bristles
Fish, dried	Hops

Horns and hooves	Sinews, animal
Horse hair	Skins
Liquorice wood	Soap and solidified oils
Mushrooms, fresh	Tobacco, cut
Peat and turf	Tobacco leaves, fresh
Putty or mastic, fresh	Vegetables, fresh
Roots	Wool;
Salt	

(b) One per centum of the weight for all other dry goods likewise subject to wastage in transit.

2. The limitation of liability provided for in paragraph 1 of this article shall not apply if, in the circumstances of a particular case, it is proved that the loss was not due to causes which would justify the above-mentioned allowances.

3. Where several packages are carried under a single consignment note, the wastage in transit shall be calculated separately for each package if its weight on despatch was shown separately in the consignment note or can otherwise be established.

4. In the event of total loss of the goods, no deduction for wastage in transit shall be made in calculating the compensation payable.

5. The provisions of this article shall not prejudice those of articles 27 and 28 of this Convention.

#### *Article 33.* AMOUNT OF COMPENSATION FOR DAMAGE TO GOODS

In the case of damage to goods, the railway shall be liable for the amount by which the goods have diminished in value, but no further damages shall be payable. This amount shall be calculated by applying to the value of the goods as defined in article 31 of this Convention the percentage of depreciation in value at the place of destination. In addition, the charges set out in the last subparagraph of article 31 (1) of this Convention shall be refunded in the same proportion.

Compensation may not, however, exceed:

- (a) If the whole consignment has been damaged, the amount which would have been payable had it all been lost;
- (b) If only part of the consignment has been damaged, the amount which would have been payable had that part been lost.

#### *Article 34.* AMOUNT OF COMPENSATION FOR EXCEEDING THE TRANSIT PERIOD

1. In the event of the transit period being exceeded the railway shall, in the absence of proof by the claimant that he has suffered loss or damage thereby, pay one-tenth of the carriage charges in respect of each fraction of the excess period equivalent to one-tenth of the transit period, any fraction of the excess period of less than one-tenth of the transit period being counted as one-tenth. Compensation shall not, however, exceed one-quarter of the carriage charges.

2. If it is proved that loss or damage has, in fact, resulted from the transit period being exceeded, compensation not exceeding twice the amount of the carriage charges shall be payable.



3. The compensation provided for in paragraphs 1 and 2 above shall not be payable in addition to that due in respect of total loss of the goods.

In the case of partial loss, such compensation shall be payable, where appropriate, in respect of that part of the consignment which has not been lost.

In the case of damage, such compensation may, where appropriate, be additional to that provided for in article 33 of this Convention.

In any case, compensation payable under paragraphs 1 and 2 of this article, together with that payable under articles 31 and 33 of this Convention, shall not, in the aggregate, exceed the compensation which would be payable in respect of total loss of the goods.

*Article 35. LIMITATION OF COMPENSATION UNDER CERTAIN TARIFFS*

When a railway agrees to special conditions of carriage (special or exceptional tariffs) involving a reduction in the carriage charges ordinarily made (general tariffs), it may limit the amount of compensation payable to a claimant in respect of loss, damage, or the transit period being exceeded, provided such limit is indicated in the tariff.

When a limit is so fixed in a tariff applicable only to a portion of the journey, it shall not apply unless the circumstances giving rise to the compensation occurred on that portion of the journey.

*Article 36. AMOUNT OF COMPENSATION IN CASE OF DECLARATION OF INTEREST IN DELIVERY*

If a declaration of interest in delivery has been made, compensation for additional loss or damage proved may be claimed, in addition to the compensation provided for in articles 31, 33, 34 of this Convention and, where appropriate, article 35 of this Convention, up to the total amount of the interest declared.

*Article 37. AMOUNT OF COMPENSATION IN CASE OF WILFUL MISCONDUCT OR GROSS NEGLIGENCE ON THE PART OF THE RAILWAY*

In all cases where the exceeding of the transit period, or total or partial loss of or damage to the goods, has been caused through wilful misconduct or gross negligence on the part of the railway, full compensation shall be payable by the railway for the damage proved. In the case of gross negligence, however, liability shall be limited to twice the maxima specified in articles 31, 33, 34, 35 and 36 of this Convention.

*Article 38. INTEREST ON COMPENSATION. REPAYMENT OF COMPENSATION*

1. The claimant shall be entitled to claim interest on compensation payable. Such interest, calculated at five per centum per annum, shall, however, be payable only when the compensation exceeds ten francs in respect of goods which are the subject of any one consignment note. Such interest shall accrue from the date of the claim referred to in article 41 of this Convention or, if no such claim has been made, from the date on which legal proceedings are instituted.

2. Any compensation unwarrantably obtained shall be refunded.

*Article 39. LIABILITY OF RAILWAYS FOR THEIR SERVANTS*

The railway shall be liable in respect of servants in its own employ and in respect of any other persons whom it employs to perform carriage for which it is responsible.

If, however, railway servants, at the request of an interested party, make out consignment notes, make translations or render other services which the railway itself is under no obligation to render, they shall be deemed to do so on behalf of the person to whom the services are rendered.

*Article 40. BRINGING OF EXTRACTIONAL ACTIONS*

No action of any kind shall be brought against a railway in respect of its liability under article 27 (1) of this Convention except subject to the conditions and limitations laid down in this Convention.

The same shall apply to any action brought against persons for whom the railway is liable under article 39 of this Convention.

Chapter II. *CLAIMS. ACTIONS. PROCEDURE AND LIMITATION*

*Article 41. CLAIMS*

1. Claims relating to the contract of carriage shall be made in writing to the railway specified in article 43 of this Convention.

2. Such a claim may be made by persons who have the right to sue the railway under article 42 of this Convention.

3. In the case of claims by the sender, the sender shall produce the duplicate consignment note. In the case of claims by the consignee the consignee shall produce the consignment note if he has taken possession of it.

4. The consignment note, the duplicate, and also any other documents which a claimant thinks it advisable to submit with his claim shall be produced either in the original or by copies duly authenticated if the railway so requires.

On settlement of the claim, the railway may require the production in their original form of the consignment note, the duplicate thereof or the "cash on delivery" charges voucher for endorsement thereon that a settlement has been made.

*Article 42. PERSONS WHO MAY BRING AN ACTION AGAINST THE RAILWAY*

1. An action for the recovery of a sum paid under the contract of carriage may only be brought by the person who made the payment.

2. An action in respect of "cash on delivery" charges provided for in article 19 of this Convention may only be brought by the sender.

3. Other actions against a railway arising out of the contract of carriage may be brought:

(a) By the sender, until such time as the consignee has either taken possession of the consignment note or exercised his rights under articles 16 (4) or 22 of this Convention;

(b) By the consignee, at any time after he has:

(i) Taken possession of the consignment note, or

- (ii) Exercised his rights under article 16 (4) of this Convention, or
- (iii) Exercised his rights under article 22 of this Convention. This right of action shall, nevertheless, be extinguished on the person designated by the consignee in accordance with article 22 (1) (c) of this Convention taking possession of the consignment note, or exercising his rights under article 16 (4) of this Convention.

In order to sustain such actions, the sender must produce the duplicate consignment note. If he does not do so he can only bring an action against the railway if he is authorised to do so by the consignee, or if he establishes that the consignee has refused to accept the goods.

*Article 43. RAILWAYS AGAINST WHICH AN ACTION MAY BE BROUGHT*

1. An action to recover sums paid under the contract of carriage may be brought either against the railway which has collected the sum in question or against the railway on whose behalf the payment beyond entitlement was received.

2. An action in respect of "cash on delivery" charges provided for in article 19 of this Convention may only be brought against the forwarding railway.

3. Other actions arising from the contract of carriage may only be brought against the forwarding railway, the railway of destination or the railway on which the cause of action arose.

Such actions may be brought against the railway of destination although it has received neither the goods nor the consignment note.

4. If the claimant has a choice as to which railway he will sue, his right to choose shall be extinguished when he brings an action against any one of these railways.

5. A right of action may, nevertheless, be exercised against a railway other than those specified in paragraphs 1, 2 and 3 above by way of counterclaim or by way of set-off to an action based on the same contract of carriage.

*Article 44. JURISDICTION*

Actions brought under this Convention may only be instituted in the competent court of the State to which the defendant railway belongs, unless otherwise provided in agreements between States or in any licence or other document authorising the operation of that railway.

Where an undertaking operates independent railway systems in different States, each system shall be regarded as a separate railway for the purposes of this Article.

*Article 45. VERIFICATION OF PARTIAL LOSS OR DAMAGE TO GOODS*

1. When partial loss of goods or damage to goods is discovered or presumed by the railway or alleged by the person entitled to the goods, the railway shall, without delay, and if possible in the presence of such person, have a report drawn up setting forth, according to the nature of the loss or damage, the condition of the goods, their weight and, as far as possible, the extent of the loss or damage, its cause and the time of its occurrence.

A copy of this report shall be supplied to the person entitled to the goods if he so requests, free of charge.

2. Should the person entitled to the goods not accept the terms of the report, he may require verification to be made, according to law, of the condition and weight of the goods and of the cause and amount of the loss or damage; the procedure to be followed shall be governed by the laws and regulations of the State in which such verification takes place.

*Article 46.* EXTINCTION OF RIGHTS OF ACTION AGAINST THE RAILWAY ARISING OUT OF THE CONTRACT OF CARRIAGE

1. Acceptance of the goods by the person entitled to them shall extinguish all rights of action against the railway for exceeding the transit period, partial loss, or damage.

2. Nevertheless, the right of action shall not be extinguished:

- (a) If the person entitled to the goods furnishes proof that the loss or damage was caused by wilful misconduct or gross negligence on the part of the railway;
- (b) In the case of a claim for exceeding the transit period made against one of the railways specified in article 43 (3) of this Convention within a period not exceeding sixty days excluding the day on which the goods were accepted by the person entitled to receive them;
- (c) In the case of a claim for partial loss or for damage:
  - (i) If the loss or damage was established before the acceptance of the goods by the person entitled to them in accordance with article 45 of this Convention;
  - (ii) If the verification which should have been made under article 45 was omitted solely through the wrongful act or neglect of the railway;
- (d) In the case of claims for loss or damage which is not apparent and is not established until after acceptance of the goods by the person entitled to them, provided that:
  - (i) Immediately after discovery of the loss or damage and in any event within seven days of the acceptance of the goods, the person entitled asks for a verification in accordance with article 45 of this Convention; when this period terminates on a Sunday or a legal holiday it shall be extended until the next working day;
  - (ii) The person entitled to the goods proves that the loss or damage occurred between acceptance for carriage and delivery.

3. If the goods have been reconsigned subject to the conditions laid down in article 29 (1) of this Convention, rights of actions for compensation in respect of partial loss or damage arising out of a previous contract of carriage shall be extinguished in the same manner as if there had only been one contract of carriage.

*Article 47.* LIMITATION OF ACTIONS ARISING OUT OF THE CONTRACT OF CARRIAGE

1. The period of limitation for an action arising out of the contract of carriage shall be one year.

Nevertheless, the period of limitation shall be three years in the case of:

- (a) An action to recover "cash on delivery" charges collected by the railway from the consignee;

- (b) An action to recover the net proceeds of a sale effected by the railway;
- (c) An action for loss or damage caused by wilful misconduct;
- (d) An action for fraud;
- (e) An action arising out of a contract of carriage previous to the reconsignment in cases to which article 29 (1) of this Convention applies.

2. The period of limitation shall begin to run:

- (a) In actions for compensation for partial loss, damage or exceeding the transit period: from the date of actual delivery;
- (b) In actions for compensation for total loss: from the thirtieth day after the expiry of the transit period;
- (c) In actions for payment or refund of carriage charges, supplementary charges, or surcharges, or actions for adjustment of charges in the event of the tariff being wrongly applied or an error in calculation being made:
  - (i) When payment has been made: from the date of payment;
  - (ii) When payment has not been made: from the date the goods were accepted for carriage if payment is due from the sender, or from the date when the consignment note was accepted by the consignee if payment is due from the consignee;
  - (iii) In the case of sums to be paid under a recharge note: from the date on which the railway delivers to the sender the statement of charges provided for in article 17 (7) of this Convention; if no such statement has been delivered, the period in respect of debts to the railway shall run from the thirtieth day after the expiry of the transit period;
- (d) If the railway is required to refund a sum which has been paid by the consignee instead of by the sender or *vice versa* and the railway brings an action for recovery: from the date of the demand for refund;
- (e) In actions relating to "cash on delivery" charges for which provision is made in article 19 of this Convention: from the forty-second day after the expiry of the transit period;
- (f) In actions to recover the net proceeds of sale: from the date of the sale;
- (g) In actions to recover additional duty demanded by Customs authorities: from the date of the demand;
- (h) In all other cases: from the date when the right of action accrues.

The day on which the period of limitation begins to run shall not be included in the period.

3. When a claim is made in writing to a railway in accordance with Article 41 of this Convention, the period of limitation shall be suspended until such date as the railway rejects the claim by notification in writing and returns the documents attached thereto. If part of the claim is admitted the period of limitation shall start to run again only in respect of that part of the claim still in dispute. The burden of proof of the receipt of the claim or of the reply and of the return of the documents shall rest with the party relying upon these facts.

The running of the period of limitation shall not be suspended by further claims having the same object.

4. A right of action which has become barred by lapse of time may not be exercised by way of counterclaim or set-off.

5. Subject to the foregoing provisions, the suspension of periods of limitation and fresh accrual of rights of action shall be governed by the laws and regulations of the State in which the action is brought.

### Chapter III. SETTLEMENT OF ACCOUNTS. RIGHTS OF RECOVERY BETWEEN RAILWAYS

#### Article 48. SETTLEMENT OF ACCOUNTS BETWEEN RAILWAYS

1. Any railway which has collected, either at the time of forwarding or on arrival, charges or other sums due under the contract of carriage shall pay to the railways concerned their respective shares of such charges or other sums.

The methods of payment shall be settled by agreement between the railways.

2. Subject to its rights against the sender, the forwarding railway shall be liable for carriage and other charges which it has failed to collect when the sender has undertaken in the consignment note to pay them.

3. Should the railway of destination deliver the goods without collecting charges or other sums due under the contract of carriage, it shall be liable for them to the preceding railways and to other parties concerned.

4. Should one railway default in payment, such default being certified by the Central Office at the request of one of the creditor railways, the resulting deficit shall be borne by the other railways which have taken part in the carriage in proportion to their shares of the carriage charges.

The right of recovery against the defaulting railway shall not be affected.

#### Article 49. RIGHT TO RECOVER COMPENSATION FOR LOSS OF OR DAMAGE TO GOODS

1. The railway which has paid compensation in compliance with the provisions of this Convention, in respect of total or partial loss of or damage to goods, shall be entitled to recover such compensation from the other railways which have taken part in the carriage, subject to the following provisions:

- (a) The railway responsible for the loss or damage shall be solely liable therefor;
- (b) When the loss or damage has been caused by the action of several railways, each shall be liable for the loss or damage it has caused. If in any case such a distinction cannot be made, the amount of the compensation payable shall be shared by those railways in accordance with the principles laid down in (c) below;
- (c) If it cannot be proved which railway or railways caused the loss or damage, the amount of the compensation shall be apportioned between the railways which have taken part in the carriage, other than those which can prove that the loss or damage did not occur on their lines. Such apportionment shall be made proportionately to the tariff distances in kilometres.

2. In the event of the insolvency of any one of the railways, the unpaid share due from it shall be divided among the other railways which have taken part in the carriage, in proportion to the tariff distances in kilometres.

*Article 50.* RIGHT TO RECOVER COMPENSATION FOR EXCEEDING  
THE TRANSIT PERIOD

1. The rules laid down in article 49 of this Convention shall apply where compensation is paid for exceeding the transit period. If the exceeding of the transit period has been caused by irregularities which are shown to have occurred on more than one railway, the amount of the compensation shall be divided between such railways in proportion to the length of the delay occurring on their respective systems.

2. The transit periods specified in article 11 of this Convention shall be allocated between the various railways which have taken part in the carriage in the following manner:

(a) Between two neighbouring railways:

- (i) The period for despatch shall be divided equally;
- (ii) The period for conveyance shall be divided in proportion to the tariff distances in kilometres of each railway;

(b) Between three or more railways:

- (i) The period for despatch shall be divided equally between the forwarding railway and the railway of destination;
- (ii) One-third of the period for conveyance shall be divided equally between all railways concerned;
- (iii) The remaining two-thirds of the period for conveyance shall be divided in proportion to the tariff distances in kilometres.

3. Any additional periods to which a railway may be entitled shall be allocated to that railway.

4. The interval between the time at which the goods are handed to the railway and the time from which the period for despatch commences shall be allocated exclusively to the forwarding railway.

5. The foregoing allocation shall only apply when the total transit period has been exceeded.

*Article 51.* PROCEDURE FOR RECOVERY

1. No railway, against which a claim is made under articles 49 and 50 of this Convention, shall be entitled to dispute the validity of the payment made by the administration making the claim if the amount of the compensation was determined by judicial authority after the said railway had been duly served with process and afforded an opportunity of entering an appearance. The court trying the action shall determine, according to the circumstances, what time shall be allowed for such notification and the entering of an appearance.

2. A railway wishing to take proceedings to enforce its right of recovery shall make all other railways concerned, with which it has not reached a settlement, defendants in the same action; if this is not done, the right of recovery of the plaintiff railway against any railway not so made a defendant shall be extinguished.

3. The court shall adjudicate on the same occasion upon all claims for recovery being tried in the same proceedings.

4. The railways made defendants in accordance with the provisions of paragraph 2 of this article shall not be entitled to bring further proceedings for recovery against another railway.

5. When an action for compensation has been brought by an outside party against a railway, that action shall not be combined with an action by that railway for recourse against another railway.

*Article 52. JURISDICTION IN ACTIONS FOR RECOVERY*

1. The courts of the country in which the defendant railway has its principal place of business shall have exclusive jurisdiction in all actions for recovery.

2. When the action is brought against several railways the plaintiff railway shall be entitled to elect in which of the courts having jurisdiction under paragraph 1 of this article it will bring the proceedings.

*Article 53. AGREEMENTS GOVERNING RIGHTS OF RECOVERY*

The railways may enter into agreements which differ from the rules of recovery set out in this chapter.

PART IV. MISCELLANEOUS PROVISIONS

*Article 54. APPLICATION OF NATIONAL LAW*

In the absence of provisions in this Convention, the national laws and regulations relating to transport in each State shall apply.

*Article 55. GENERAL RULES OF PROCEDURE*

In the case of legal proceedings arising out of carriage under this Convention, the procedure to be followed shall be that of the competent tribunal, subject to any provisions to the contrary in the Convention.

*Article 56. EXECUTION OF JUDGMENTS. ATTACHMENT  
AND SECURITY FOR COSTS*

I. Judgments entered by the competent court under the provisions of this Convention after trial, or by default, shall, when they have become enforceable under the law applied by that court, become enforceable in any of the other Contracting States as soon as the formalities required in the State concerned have been complied with. The merits of the case shall not be the subject of further proceedings.

The foregoing provisions shall not apply to interim judgments nor to awards of damages, in addition to costs, against a plaintiff who fails in his action.

2. Debts arising out of international traffic and due from one railway to another which does not belong to the same State may only be attached under a judgment given by the courts of the State to which the creditor railway belongs.

3. Rolling stock belonging to a railway, as well as all transport equipment belonging to a railway, such as containers, loading appliances, tarpaulin sheets, etc., may not be attached on any territory other than that of the State to which the owning railway belongs except under a judgment given by the courts of that State.



Private owners' wagons, as well as all transport equipment contained in such wagons and belonging to the owner of the wagon, may not be attached on any territory other than that of the State in which the owner has his principal place of business, except under a judgment given by the courts of that State.

4. Security for costs shall not be required in proceedings founded on an international contract of carriage.

*Article 57. MONETARY UNIT. RATE OF EXCHANGE OR ACCEPTANCE OF FOREIGN CURRENCY*

1. The amounts stated in francs in this Convention or the Annexes thereto shall be deemed to relate to the gold franc weighing 10/31 of a gramme and being of millesimal fineness 900.

2. Each railway shall publish the rates at which it will convert carriage charges, other charges and "cash on delivery" charges expressed in foreign currencies but paid in the currency of the country to which the railway belongs (rate of exchange.)

3. A railway which accepts payment in foreign currencies shall likewise publish the rates at which those currencies will be accepted (rate of acceptance).

*Article 58. CENTRAL OFFICE FOR INTERNATIONAL RAILWAY TRANSPORT*

1. In order to facilitate and ensure the operation of this Convention there shall be a Central Office for International Railway Transport which shall have the following duties:

- (a) To receive communications from any Contracting State and any railway concerned and to communicate them to the other States and railways;
- (b) To collect, collate and publish information of every kind concerning international transport services;
- (c) To facilitate between the various railways financial relations arising out of international transport services and recovery of outstanding debts and to this end to ensure the continuance of proper relations between the railways;
- (d) To undertake, at the request of a Contracting State or of a transport undertaking with lines or services scheduled in the list provided for in article 59 of this Convention, the task of conciliation, by offering its good offices or mediation or otherwise, with a view to settling disputes between such States or undertakings arising out of the interpretation or application of this Convention;
- (e) To give, at the request of the parties, whether States, transport undertakings or users, an advisory opinion concerning disputes arising out of the interpretation or application of this Convention;
- (f) To assist in the determination by arbitration of disputes arising out of the interpretation or application of this Convention;
- (g) To examine requests for the amendment of this Convention and to propose, when necessary, that the Conferences provided for in article 69 of this Convention be convened.

2. The location, composition, organisation and finance of the aforesaid Office, and its administration and control, shall be regulated by the provisions of Annex V to this Convention.

*Article 59.* LIST OF LINES TO WHICH THE CONVENTION APPLIES

1. The Central Office provided for in article 58 of this Convention shall compile and keep up to date the list of the lines to which this Convention applies. For this purpose Contracting States shall notify the Office of any addition to the list or any removal therefrom of the lines of a railway or the services of an undertaking referred to in article 2 of this Convention.

2. The addition of a new line for the purpose of international traffic shall not be effective until one month after the date of the letter from the Central Office notifying the other States of the inclusion of that line in the list.

3. The Central Office shall remove a line from the list immediately on receipt of notification from the Contracting State at whose request the line was included in the list that the requirements of the Convention in respect of that line can no longer be fulfilled.

4. The receipt of notification from the Central Office shall be sufficient authority for any railway to discontinue immediately all international traffic relations in regard to a line removed from the list, except in respect of traffic already in transit, which shall be carried to its destination.

*Article 60.* SPECIAL PROVISIONS FOR CERTAIN TYPES OF TRANSPORT.  
SUPPLEMENTARY PROVISIONS

1. Haulage of private owners' wagons shall be subject to the provisions of Annex VII to this Convention.

2. Carriage of containers shall be subject to the provisions of Annex VIII to this Convention.

3. In the case of express parcels traffic railways may, by including appropriate provisions in their tariffs, agree special conditions in accordance with Annex IX to this Convention.

4. In the case of the following types of transport:

- (a) Carriage under a negotiable document,
- (b) Carriage of goods to be delivered only against return of the duplicate consignment note,
- (c) Carriage of newspapers,
- (d) Carriage of goods intended for fairs or exhibitions,
- (e) Carriage of loading appliances and of equipment for protection of goods in transit against heat or cold,

two or more Contracting States by special agreement, or railways by the inclusion of appropriate clauses in their tariffs, may agree conditions adapted to these types of carriage and differing from those of this Convention; in particular, a transport document differing from that in Annex II to this Convention may be specified.

5. Any supplementary provisions which Contracting States or participating railways may publish with a view to the operation of this Convention shall be notified by them to the Central Office.

These supplementary provisions may be put into force on the railways which have adopted them, in the manner required by the laws and regulations of each State, but they may not derogate from the provisions of this Convention.

The Central Office shall be notified of the coming into force of such supplementary provisions.

*Article 61.* REGULATION OF DISPUTES BY ARBITRATION

1. Whether this Convention is applied by national law or by contract, disputes concerning the interpretation or the application of the Convention and of any supplementary provisions promulgated by certain Contracting States and of special agreements provided for in article 60 (4) of this Convention may, at the request of the parties and provided they cannot be settled by the parties themselves, be submitted to arbitration tribunals the composition and procedure of which form the subject of Annex X to this Convention.

2. Nevertheless, in the case of disputes between States, the parties are not bound by the provisions of Annex X and may freely determine the composition of the arbitration tribunal and the arbitration procedure.

3. At the request of the parties the arbitration procedure may be invoked:

(a) Without prejudice to any right of the parties to have recourse to other legal procedure for the settlement of disputes,

(i) In respect of disputes between Contracting States,

(ii) In respect of disputes between Contracting States on the one hand and non-Contracting States on the other,

(iii) In respect of disputes between non-Contracting States,

if, in the case of (ii) and (iii) above, the Convention is applied by national law or by contract;

(b) In respect of disputes between transport undertakings;

(c) In respect of disputes between transport undertakings and users;

(d) In respect of disputes between users.

4. The commencement of arbitration proceedings shall have the same effect as the institution of an action in the ordinary courts has on the suspension of periods of limitation and the fresh accrual of rights of action.

5. Awards made by arbitration tribunals against transport undertakings or users shall become enforceable in each of the Contracting States as soon as the formalities required by the State in which enforcement is to take place have been complied with.

PART V. SPECIAL PROVISIONS

*Article 62.* TEMPORARY DEROGATIONS

1. If the economic and financial position of any State is such as to cause serious difficulty in applying the provisions of Chapter III of Part III of this Convention, each State may, either by the insertion of provisions in tariffs, or by action on its part such as general or special authorisation to railway administrations, derogate from the provisions of articles 17, 19 and 21 of this Convention and determine in relation to specified traffic:

(a) That consignments from the territory of the State so acting shall be forwarded charges paid,

- (i) As far as its frontiers and no further, or
- (ii) At least as far as its frontiers;
- (b) That consignments to destinations in the State so acting shall be forwarded charges paid,
  - (i) At least as far as its frontiers to the extent that the country of departure has not imposed the restriction provided for in (a) (i) above, or
  - (ii) At most as far as its frontiers;
- (c) That consignments from or to its territory may not be made subject to any “cash on delivery” charges and that no disbursements shall be allowed or that such charges and disbursements shall only be allowed within certain limits;
- (d) That the sender shall not be permitted to modify the contract of carriage in matters affecting the country of destination, payment of charges and “cash on delivery” charges.

2. Under the foregoing conditions States may, by giving general or special authority to railway administrations, derogate from the provisions of articles 17, 19, 21 and 22 of this Convention and determine in their reciprocal arrangements:

- (a) That the rules for the payment of charges shall be specially fixed by agreement between the railways concerned, so however that such rules may not prescribe methods of payment other than those provided for in article 17 of this Convention;
- (b) Which requests, if any, for modification of the contract of carriage shall not be allowed.

3. Measures taken in accordance with paragraphs 1 and 2 of this article shall be notified to the Central Office.

The measures set out in paragraph 1 above shall come into force at earliest after the expiry of a period of eight days from the date on which the Central Office shall have notified such measures to the other States.

The measures set out in paragraph 2 above shall come into force at earliest after the expiry of a period of two days from the date of their publication in the States concerned.

4. Consignments in transit shall not be affected by such measures.

#### *Article 63. LIABILITY IN RESPECT OF RAIL-SEA TRAFFIC*

1. In rail-sea transport by the services referred to in article 2 (1) of this Convention each State may, by requesting that a suitable note be included in the list of lines governed by the Convention, indicate that the following grounds of exemption from liability will apply in their entirety in addition to those provided for in article 27 of this Convention.

The carrier may only avail himself of these grounds of exemption if he proves that the loss, damage or exceeding of the transit period occurred in the course of carriage by sea between the time when the goods were loaded on board the ship and the time when they were unloaded from the ship.

The grounds of exemption are as follows:

- (a) Act, neglect or default of the master, mariner, pilot, or the servants of the carrier in the navigation or in the management of the ship;

- (b) Unseaworthiness of the ship, if the carrier proves that the unseaworthiness was not due to lack of due diligence on his part to make the ship seaworthy, to secure that it is properly manned, equipped and supplied or to make all parts of the ship in which goods are carried fit and safe for their reception, carriage and preservation;
- (c) Fire, if the carrier proves that it was not caused by his act or default, or that of the master, mariner, pilot, or that of the carrier's servants;
- (d) Perils, dangers and accidents of the sea or other navigable waters;
- (e) Saving or attempting to save life or property at sea;
- (f) The carriage of goods on the deck of the ship, if they are so carried with the consent of the sender given in the consignment note and are not in wagons.

The above grounds of exemption do not affect the general obligations of the carrier and, in particular, his obligation to exercise due diligence to make the ship seaworthy, to secure that it is properly manned, equipped and supplied and to make all parts of the ship in which goods are carried fit and safe for their reception, carriage and preservation.

Even when the carrier can rely on the foregoing grounds of exemption, he shall nevertheless remain liable if the person entitled to claim proves that the loss, damage or exceeding of the transit period is due to the wrongful act or neglect of the carrier, master, mariner, pilot, or of the carrier's servants other than that referred to in (a) above.

2. Where the same sea route is served by several undertakings included in the list provided for in Article 1 of this Convention, the rules of liability shall be the same for all those undertakings.

In addition where such undertakings have been included in the list at the request of several States, the adoption of such rules of liability shall be the subject of prior agreement between those States.

3. The measures taken under this article shall be notified to the Central Office. They shall not come into force before the expiry of thirty days from the date of the letter by which the Central Office notified such measures to the other States.

Consignments in transit shall not be affected by such measures.

#### *Article 64.* LIABILITY IN CASE OF NUCLEAR INCIDENTS

The railway shall not be liable under this Convention for loss or damage caused by a nuclear incident when pursuant to special provisions in force in a Contracting State governing liability in the field of nuclear energy the operator of a nuclear installation or another person who is substituted for him is liable for the loss or damage.

### PART VI. FINAL PROVISIONS

#### *Article 65.* SIGNATURE

This Convention, of which the Annexes form an integral part, shall remain open until 1st May, 1961, for signature by the States which have been invited to be represented at the Ordinary Revision Conference.

*Article 66.* RATIFICATION. COMING INTO FORCE

This Convention shall be subject to ratification and the instruments of ratification shall be deposited with the Swiss Government as soon as possible.

When the Convention has been ratified by fifteen States, the Swiss Government shall consult the Governments concerned with a view to examining with them the possibility of bringing the Convention into force.

*Article 67.* ACCESSION TO THE CONVENTION

1. Any non-signatory State wishing to accede to this Convention shall address its application to the Swiss Government, who shall transmit it to all the Contracting States together with a note from the Central Office on the position of the railways of the applicant State from the standpoint of international transport.

2. Unless within six months of the date of such notification at least two States have notified the Swiss Government of their opposition, the application shall be deemed to be accepted and the applicant State and all the Contracting States shall be notified accordingly by the Swiss Government.

In the contrary case, the Swiss Government shall notify all the Contracting States and the applicant State that examination of the application has been adjourned.

3. Every accession shall take effect one month after the date of the notification sent by the Swiss Government, or, if at the expiry of this period the Convention has not yet come into force, at the date of its coming into force.

*Article 68.* DURATION OF THE OBLIGATION OF CONTRACTING STATES

1. The duration of this Convention shall be unlimited. Any Contracting State may, however, withdraw subject to the following conditions:

The Convention shall have effect for every Contracting State until the 31st December of the fifth year following its coming into force. Any State wishing to withdraw at the expiry of this period shall notify its intention at least one year in advance to the Swiss Government, who shall inform all the other Contracting States.

Failing such notification within the period specified, each Contracting State shall remain bound by the Convention for a further period of three years, and shall continue to be so bound thereafter for three-year periods unless it denounces the Convention at least one year before the 31st December of the final year of one of the three-year periods.

2. States admitted as parties to the Convention during the five-year period or during one of the three-year periods shall be bound until the end of that period, and thereafter until the end of each of the following periods in so far as they have not denounced the Convention at least one year before the expiry of one such period.

*Article 69.* REVISION OF THE CONVENTION

1. Delegates of the Contracting States shall meet to revise the Convention not later than five years after the coming into force of this Convention and shall be summoned for that purpose by the Swiss Government.

A Conference shall be convened before that time on the request of at least one-third of the Contracting States.

With the agreement of the majority of the Contracting States, the Swiss Government may also invite non-Contracting States to attend.

With the agreement of the majority of the Contracting States, the Central Office may invite to the Conference representatives of:

- (a) Intergovernmental organisations which are concerned with transport matters;
- (b) International non-governmental organisations dealing with transport.

Participation in the proceedings by delegations of non-Contracting States and of the said international organisations shall be determined by the rules of procedure adopted at each Conference.

With the agreement of the majority of Governments of the Contracting States, the Central Office may, before Ordinary and Extraordinary Revision Conferences, convene Committees to make preliminary examinations of revision proposals. The provisions of Annex VI to this Convention shall apply to such Committees, with any necessary modifications.

2. Upon the coming into force of a new Convention resulting from a Revision Conference, the preceding Convention shall thereby be rendered void even in respect of Contracting States which do not ratify the new Convention.

3. In the intervals between revision conferences, articles 3, 4, 5 (5), 6, 11, 13, 17, 19, 21, 22, 23, 24, 25, 48, 49, 50 and 53 of this Convention and Annexes II, III, IV a, IV b, IX and X to this Convention may be amended by a Revision Committee. The composition and procedure of this Committee shall be in accordance with the provisions of Annex VI to this Convention.

The decisions of the Revision Committee shall be notified without delay to the Governments of the Contracting States through the Central Office. The decisions shall be deemed to be accepted unless within three months from the date of such notification at least five Governments have lodged objections; and shall come into force on the first day of the sixth month following the month in which the Central Office shall have brought them to the notice of the Governments of the Contracting States. The Central Office shall indicate that date when communicating the decisions.

4. In order to amend:

- (a) The International Regulations concerning the carriage of dangerous goods by rail (Annex I),
- (b) The International Regulations concerning the haulage of private owners' wagons (Annex VII), and
- (c) The International Regulations concerning the carriage of containers (Annex VIII),

there shall be set up Committees of Experts, whose composition and procedure shall be in accordance with the provisions of Annex VI to this Convention.

The decisions of the Committees of Experts shall be notified without delay to the Governments of the Contracting States through the Central Office. The decisions shall be deemed to be accepted unless within three months from the date of such notification at least five Governments have lodged objections; and

shall come into force on the first day of the sixth month following the month in which the Central Office shall have brought them to the notice of the Governments of the Contracting States. The Central Office shall indicate that date when communicating the decisions.

*Article 70.* TEXTS OF THE CONVENTION. OFFICIAL TRANSLATIONS

This Convention has been concluded and signed in the French language in accordance with established diplomatic practice.

In addition to the French text there shall be German, English and Italian texts having the status of official translations.

In case of divergence, the French text shall prevail.

IN WITNESS WHEREOF, the plenipotentiaries hereinafter mentioned, furnished with full powers which have been found to be in good order and proper form, have signed this Convention.

DONE at Berne, this twenty-fifth day of February, one thousand nine hundred and sixty-one, in one original which shall be deposited in the archives of the Swiss Confederation and an authentic copy of which shall be sent to each of the Parties.

For Austria:

Dr. KREMLER

For Belgium:

F. SEYNAEVE

For Bulgaria:

S. DRAGOMIROV

For Denmark:

TH. JENSEN

For Spain:

Marquis de MIRAFLORES



For Finland:

OSMO ORKOMIES

For France:

E. DENNERY

For Greece:

A. HART-SOUTZOS

For Hungary:

SKONDA ÖDÖN

For Italy:

LUIGI BRANCA

For Lebanon:

RAÏF ABILLAMA

For Liechtenstein:

A. HILBE

For Luxembourg:

A. CLEMANG

For Norway:

HENR. A. BROCH

For the Netherlands:

H. E. SCHEFFER  
For the Kingdom in Europe

For Poland:

BATKOWSKI

For Portugal:

MARIO DIAS TRIGO

For Rumania:

G. NISTORAN

For the United Kingdom of Great Britain and Northern Ireland:

J. S. ROOKE  
A. H. KENT

For Sweden:

CLAS NORDSTRÖM

For Switzerland:

SCHALLER

For Czechoslovakia:

JAN OBHLÍDAL

For Turkey:

H. UGAN

For Yugoslavia:

V. NIKOLIĆ

## [TRANSLATION — TRADUCTION]

INTERNATIONAL CONVENTION CONCERNING  
THE CARRIAGE OF GOODS BY RAIL (CIM)A N N E X I<sup>1</sup>INTERNATIONAL REGULATIONS CONCERNING THE CARRIAGE  
OF DANGEROUS GOODS BY RAIL (RID)

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<sup>1</sup> The text of Annex I, as proposed on 1 June 1962 at the XVIIth session of the Committee of Experts, was not adopted under that form but was subsequently revised in accordance with article 69 (4) (a) of the Convention and entered into force on 1 April 1967.

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#### PART I. GENERAL REGULATIONS

1 (1) Annex I constitutes the rules for the carrying out of article 3 (*d*) and of article 4, para. 1 (*a*) of the International Convention concerning the carriage of goods by rail (CIM). It is entitled "RID", which is the abbreviation for "Règlement international concernant le transport des marchandises dangereuses par chemins de fer" ("International Regulations concerning the carriage of dangerous goods by rail").

(2) The substances and articles of RID are arranged in the following Classes:

- Class I a. Explosive substances and articles.
- Class I b. Articles filled with explosive substances.
- Class I c. Igniters, fireworks and similar goods.
- Class I d. Gases: compressed, liquefied or dissolved under pressure.
- Class I e. Substances which give off inflammable gases on contact with water.
- Class II. Substances liable to spontaneous combustion.
- Class III a. Inflammable liquids.
- Class III b. Inflammable solids.
- Class III c. Oxidising substances.
- Class IV a. Poisonous substances.
- Class IV b. Radioactive substances.
- Class V. Corrosive substances.
- Class VI. Repugnant substances and substances liable to cause infection.
- Class VII. Organic peroxides.

(3) Substances and articles covered by the headings of Classes I a, I b, I c, I d, I e, II, IV b, VI and VII (limitative Classes) are not to be accepted for carriage, with the following exceptions. Substances and articles listed under marginal numbers (marg.) 21, 61, 101, 131, 181, 201, 451, 601 and 701 are to be accepted for carriage provided that they comply with the conditions laid down in the various Classes.

(4) Substances and articles mentioned in marg. 301, 331, 371, 401 and 501 of Classes III a, III b, III c, IV a and V (non-limitative Classes) are to be accepted for carriage only under the conditions laid down for the various Classes. The

remaining substances and articles covered by the headings of Classes III a, III b, III c, IV a and V are to be accepted for carriage without special conditions.

(5) Substances and articles which are expressly excluded from carriage under the terms of the notes set out in the various Classes are not to be accepted for carriage.

(6) Normal conditions of carriage are applicable to substances and articles of RID, unless otherwise provided by RID.

NOTE. The provisions of article 4, para. 2, of CIM are as follows:

“2. Two or more Contracting States may arrange, by agreement, that certain substances or articles not acceptable for carriage under the provisions of Annex I to this Convention will be accepted for international carriage between those States subject to certain conditions, or that the substances and articles specified in Annex I to this Convention will be accepted subject to conditions less onerous than those laid down in the said Annex.

Railways may also, by clauses in their tariffs, either accept certain substances or articles not acceptable for carriage under the provisions of Annex I to this Convention, or adopt conditions less onerous than those laid down in Annex I to this Convention for substances and articles accepted under the said Annex.

Such agreements and tariff clauses must be notified to the Central Office for International Railway Transport.”

2 (1) The conditions of carriage applicable to each Class are subdivided as follows:

A. Packages:

1. General conditions for packing;
2. Packing of individual substances or articles of the same kind;
3. Mixed packing;
4. Marking and danger labels on packages.

B. Method of despatch and restrictions on forwarding.

C. Particulars in the consignment note.

D. Transport equipment:

1. Conditions relating to wagons and their loading;
2. Marking and danger labels on wagons and on small containers.

E. Prohibitions on mixed loading.

F. Empty packagings.

G. Other regulations.

The Appendices contain:

Appendix I, stability and safety conditions relating to explosive substances, inflammable solids and organic peroxides, together with rules for tests;

Appendix II, recommendations relating to the nature of aluminium-alloy receptacles for certain gases of Class I d, regulations and recommendations concerning the materials and construction of receptacles of tank wagons intended for the carriage of deeply refrigerated liquefied gases of Class I d, and regulations relating to tests on aerosol dispensers and non-refillable containers for gases under pressure of Class I d, items 16 and 17;

Appendix III, tests relating to inflammable liquids of Classes III a and IV a;

Appendix IV, conditions governing the use of electrically-fitted wagons;

Appendix V, regulations relating to tests on steel drums for the carriage of inflammable liquids of Class III a;

Appendix VI, tables; method of applying the criteria of Nuclear Safety Class I; and methods of testing packagings intended for substances of Class IV b;

Appendix VII (reserved);

Appendix VIII (reserved);

Appendix IX, regulations relating to danger labels, and explanation of the diagrams.

(2) The regulations for the completion of formalities required by the customs and other administrative authorities should also be observed (see art. 13, para. 1, of CIM).

In addition to the particulars and attestations required by RID, it is particularly necessary that the attestations called for by the administrative authorities should also be entered in the consignment note, to which any accompanying documents required by these authorities should be attached.

(3) In conformity with para. 2 RIE<sub>x</sub> (Annex IX of CIM), substances and articles of RID are only to be accepted for carriage as express parcels (*colis express*) in so far as this means of carriage is specifically laid down under Section B of the various Classes.

(4) In conformity with article 17 (a) of the International Convention concerning the carriage of passengers and luggage by rail (CIV), substances and articles of RID are excluded from carriage as luggage unless the tariffs provide for exceptions.

(5) In the case of carriage by more than one form of transport, as referred to in article 2, paras. 1 to 3, of CIM, any special, national or international rules, for the carriage of dangerous goods, whether by road or water, are also applicable, in addition to the provisions of RID, in so far as they do not conflict with the provisions of RID.

### 3

(1) A non-radioactive substance (see the definition of radioactive substances in introductory note 1 under the heading of Class IV b) falling under a collective heading of any Class is not to be accepted for carriage if in addition it is covered by the heading of a limitative Class where it is not listed.

(2) A non-radioactive substance (see the definition of radioactive substances in introductory note 1 under the heading of Class IV b) not specifically listed in a Class, but falling under two or several collective headings of various Classes is subject to the conditions of carriage laid down:

(a) In the limitative Class, if one of the relevant Classes is limitative;

(b) In the Class corresponding to the principal danger which the substance is likely to manifest during carriage, if none of the relevant Classes is limitative.

(3) When the solutions of substances of RID are not specifically mentioned in the list of the Class to which the dissolved substances belong, they are nevertheless to be considered as substances of RID if their concentration is such that they still retain the inherent danger of the substances themselves; their packaging must then be in conformity with the regulations of section A of the Class of these substances, it being understood that packagings which are not suitable for the carriage of liquids must not be used.

(4) Mixtures of RID substances with other substances are to be considered as RID substances if they retain the inherent danger of the RID substance.

- 4 (1) Unless expressly stated otherwise, the sign “%” represents in RID:
- (a) In the case of mixtures of solid substances or of liquid substances, and also in the case of solutions and of solid substances wetted by a liquid: a percentage by weight based on the total weight of the mixture, the solution or the wetted substance;
- (b) In the case of gaseous mixtures: a percentage by volume based on the total volume of the gaseous mixture.
- (2) All types of pressure relating to receptacles (e.g. test pressure, internal pressure, opening pressure for safety valves) are always indicated in kg/cm<sup>2</sup> manometric (gauge) pressure (pressure in excess of atmospheric pressure); however, the vapour pressure of substances is always expressed in kg/cm<sup>2</sup> absolute pressure.
- (3) Where RID specifies a degree of filling for receptacles, that degree of filling is always referred to a temperature of 15° C for substances, unless some other temperature is indicated.
- (4) Where weights of packages are referred to in RID, gross weight is meant unless otherwise stated.
- (5) The term “fragile package” means a package containing receptacles made of glass, porcelain, stoneware or similar materials which are not enclosed in packaging with complete sides protecting them effectively against impact.
- (6) Fragile receptacles secured, either singly or in groups, by cushioning material in a strong receptacle are not considered to be fragile receptacles provided that the strong receptacle is leakproof and so designed that, should the fragile receptacles break or leak, the contents cannot escape from the strong receptacle and the mechanical strength of the receptacle is not impaired by corrosion during carriage.
- 5 Where receptacles made of a plastics material are accepted as packaging, the railway administration of the country of origin can insist upon proof that the plastics material is appropriate for its intended use.
- 6 A substance of RID may be carried in bulk, in tank wagons or in small containers only if these means of carriage are specifically authorised for the substance in question in the corresponding Class.
- 7 (1) Only those containers which satisfy the requirements of RICO (Annex VIII of CIM) are considered to be containers for purposes of RID.
- (2) All provisions of RID relating to carriage in wagons apply similarly to carriage in large containers.
- (3) The regulations relating to large containers shall apply to small containers intended for the carriage of goods in bulk, subject to the conditions applicable to small containers under section D of each Class.
- (4) The regulations relating to receptacles sent as packages shall apply to small tank containers, unless the special regulations of the various Classes state otherwise.
- 8 (1) If the mixed packing of several substances or articles with one another or with other goods is allowed under the provisions of section A.3 of the various Classes, the inner packagings containing various substances and articles must be carefully and effectively separated from one another in the outer packagings if dangerous reactions, such as the production of dangerous heat, combustion, the formation of mixtures sensitive to friction or impact, and the release of inflammable or toxic gases are liable to occur as a result of damage to or destruction of the inner packagings. In particular, if fragile receptacles are used, and especially



if the said receptacles contain liquids, the danger of the formation of dangerous mixtures must be avoided and to this end all appropriate measures must be taken, such as the use of suitable cushioning material in sufficient quantity, the securing of receptacles in a second, strong packaging, and the subdivision of the outer packaging into several compartments.

(2) In the case of mixed packing, the provisions of RID relating to the particulars in the consignment note apply in respect of each of the different kinds of dangerous goods contained in the collective package, and the collective package must bear all the markings and all the danger labels required by RID for the dangerous goods it contains.

- 9 Other outer packagings in addition to those prescribed by RID may also be used, on condition that they do not contravene the spirit of the provisions of RID for outer packagings. If such additional packagings are used, any markings and labels prescribed must be affixed to these packagings.

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## PART II. REGULATIONS RELATING TO THE VARIOUS CLASSES

### CLASS I a. EXPLOSIVE SUBSTANCES AND ARTICLES

NOTE. Substances which cannot explode on contact with a flame and which are not more sensitive to impact or to friction than dinitrobenzene, are not subject to the regulations of Class I a.

#### 1. List of substances and articles

- 20 (1) Among the substances and articles covered by the heading of Class I a, only those listed in marg. 21 are to be accepted for carriage, and then only subject to the conditions laid down in marg. 20 (2) to 47. These substances and articles to be accepted for carriage under certain conditions are to be considered as substances and articles of RID.

(2) In the explosives which are to be accepted for carriage, nitroglycerine may be replaced wholly or in part by:

- (a) Nitroglycol or
- (b) Dinitrodiethyleneglycol or
- (c) Nitrated sugar (nitrated saccharose) or
- (d) A mixture of the above substances.

- 21 1. Highly nitrated *nitrocellulose* (such as *guncotton*), i.e. with a nitrogen content of more than 12.6%, well stabilised and containing in addition:

When the nitrocellulose is not compressed, not less than 25% water or alcohol (methyl, ethyl, normal propyl or isopropyl, butyl, amyl alcohol or mixtures thereof), including denatured alcohol; or mixtures of water and alcohol,

When the nitrocellulose is compressed, not less than 15% water, or not less than 12% paraffin wax or other similarly effective substances.

See also Appendix I, marg. 1101.

NOTE. 1. Nitrocellulose with a nitrogen content not exceeding 12.6% is a substance of Class III b if it complies with the specifications set out in marg. 331, item 7 (a), (b) and (c).

2. Nitrocellulose in the form of nitrocellulose film-waste, free from gelatine, in reels, sheets or strips, is a substance of Class II [see marg. 201, item 4].

2. *Cordite paste*, non-gelatinised ("powder cake"), for use in the making of smokeless powders and containing not more than 70% anhydrous substance and not less than 30% water; the anhydrous substance must not contain more than 50% nitroglycerine or similar liquid explosives.

3. Gelatinised *nitrocellulose powders* and gelatinised nitrocellulose powders containing nitroglycerine (*nitroglycerine powders*):

(a) *Non-porous and non-dusty*,

(b) *Porous or dusty*.

See also Appendix I, marg. 1102.

4. Plasticised *nitrocellulose* containing not less than 12% but less than 18% plasticising substances (such as dibutyl phthalate or a plasticiser at least equal in effect to dibutyl phthalate), and whose nitrocellulose has a nitrogen content not exceeding 12.6%, also in the form of chips.

NOTE. Plasticised nitrocellulose containing not less than 18% of dibutyl phthalate or a plasticiser at least equal in effect to dibutyl phthalate is a substance of Class III b [see marg. 331, item 7 (b) and (c)].

See also Appendix I, marg. 1102, item 1.

5. Non-gelatinised *nitrocellulose powders*. See also Appendix I, marg. 1102.

6. *Trinitrotoluene (tetryl)*, also when compressed or cast, *trinitrotoluene* mixed with aluminium, mixtures termed *liquid trinitrotoluene*, and *trinitroanisole*. See also Appendix I, marg. 1103.

7. (a) *Hexyl* (hexanitrodiphenylamine) and *picric acid*;

(b) *Pentolites* (mixtures of pentaerythritol tetranitrate and trinitrotoluene) and *hexolites* (mixtures of trimethylene-trinitramine and trinitrotoluene) if their trinitrotoluene content is such that their sensitiveness to impact does not exceed that of tetryl;

(c) Phlegmatised *penthrite* (pentaerythritol tetranitrate) and phlegmatised *hexogen* (trimethylene-trinitramine), both phlegmatised by incorporation of wax, paraffin wax or other similarly effective substances in such quantity that the sensitiveness of these substances to impact does not exceed that of tetryl.

For (a), (b) and (c), see also Appendix I, marg. 1103.

NOTE. Substances of item 7 (b) and phlegmatised hexogen of item 7 (c) may also contain aluminium.

8. Explosive organic nitro-compounds:

(a) *Soluble in water*, e.g. *trinitroresorcinol*;

(b) *Insoluble in water*, e.g. *tetryl* (trinitrophenylmethylnitramine);

(c) *Tetryl gaines* without metal covering.

For (a) and (b), see also Appendix I, marg. 1103.

NOTE. Except for liquid trinitrotoluene (item 6), explosive organic nitro-compounds in liquid form are not to be accepted for carriage.

9. (a) Moist *penthrite* (pentaerythritol tetranitrate) and moist *hexogen* (trimethylene-trinitramine) wetted throughout with not less than 20% water in the case of the former and not less than 15% in the case of the latter;

(b) Moist *pentolites* (mixtures of penthrite and trinitrotoluene) and moist *hexolites* (mixtures of hexogen and trinitrotoluene), whose sensitiveness to impact in the dry state exceeds that of tetryl, wetted throughout with not less than 15% water;

(c) Moist mixtures of *penthrite* or of *hexogen* with wax, *paraffin wax* or with substances similar to wax and *paraffin wax*, whose sensitiveness to impact in the dry state exceeds that of *tetryl*, wetted throughout with not less than 15% water;

(d) Compressed *penthrite* *gaines* without metal covering.

For (a), (b) and (c), see also Appendix I, marg. 1103.

10. (a) *Benzoyl peroxide*:

1. In the dry state or with less than 10% water;
2. With less than 30% phlegmatiser;

NOTE. 1. *Benzoyl peroxide* with not less than 10% water or with not less than 30% phlegmatiser, is a substance of Class VII [see marg. 701, item 8 (a) and (b)].

2. *Benzoyl peroxide* with not less than 70% dry and inert solids is not subject to the provisions of RID.

(b) *Cyclohexanone peroxides* [1-hydroxy-hydroperoxydicyclohexyl-peroxide and bis(1-hydroxy-cyclohexyl) peroxide and mixtures of these two compounds]:

1. In the dry state or with less than 5% water;
2. With less than 30% phlegmatiser;

NOTE. 1. *Cyclohexanone peroxides* and their mixtures with not less than 5% water or with not less than 30% phlegmatiser are substances of Class VII [see marg. 701, item 9 (a) and (b)].

2. *Cyclohexanone peroxides* and their mixtures with not less than 70% dry and inert solids are not subject to the provisions of RID.

(c) *Parachlorobenzoyl peroxide*:

1. In the dry state or with less than 10% water;
2. With less than 30% phlegmatiser.

NOTE. 1. *Parachlorobenzoyl peroxide* with not less than 10% water or with not less than 30% phlegmatiser, is a substance of Class VII [see marg. 701, item 17 (a) and (b)].

2. *Parachlorobenzoyl peroxide* with not less than 70% dry and inert solids is not subject to the provisions of RID.

11. (a) *Black powder* (with a basis of potassium nitrate) in corned or in meal form;

(b) *Slow mining powders similar to black powder* (composed of sodium nitrate, sulphur and wood charcoal, coal or lignite, or made with potassium nitrate, with or without sodium nitrate, sulphur, coal or lignite);

(c) *Cartridges of compressed black powder or powder similar to compressed black powder*.

NOTE. The density of the compressed mass must not be less than 1.50.

For (a) and (b), see also Appendix I, marg. 1104.

12. (a) *Nitrate explosives*, in powder form, not covered by item 11 or item 14 (a) or (c), composed principally of ammonium nitrate or of a mixture of alkali nitrates or alkaline earth metals with ammonium chloride or of a mixture of ammonium nitrate with alkali nitrates or alkaline earth metals and with ammonium chloride. In addition, they may contain inflammable substances (for example, wood meal or another vegetable meal or hydrocarbons), aromatic nitrated compounds, nitroglycerine or nitroglycol or a mixture of the two, and inert stabilising or colouring substances;

(b) *Explosives not containing inorganic nitrate*, in powder form composed principally of a mixture of inert substances (for example, alkali chlorides) with nitroglycerine or nitroglycol or a mixture of the two. In addition, they may contain aromatic nitrated compounds and products having a phlegmatizing, stabilising or gelatinising or colouring effect.

For (a) and (b), see also Appendix I, marg. 1105.

13. *Chlorate and perchlorate explosives*, i.e. mixtures of the chlorates or perchlorates of alkali or alkaline earth metals with compounds rich in carbon. See also Appendix I, marg. 1106.

14. (a) *Dynamites* with an inert absorbent, and *explosives similar to dynamite* with an inert absorbent;

(b) *Blasting gelatine* consisting of guncotton and not more than 93% nitroglycerine, and *gelatinised dynamites* with a nitroglycerine content not exceeding 85%;

(c) *Gelatinous nitrate explosives*, composed principally of ammonium nitrate or of a mixture of ammonium nitrate with metal alkali nitrates or alkaline earth metals whose gelatinised nitroglycerine or nitroglycol content or mixture of the two does not exceed 40%. In addition, they may contain nitrated compounds or inflammable substances (for example, wood meal or any other vegetable meal or hydrocarbons), and other inert or colouring substances.

For (a), (b) and (c), see also Appendix I, marg. 1107.

15. *Empty packagings*, uncleaned, which have contained substances or articles of Class I a.

## 2. Conditions of carriage

(The regulations relating to empty packagings are to be found under F.)

### A. PACKAGES

#### 1. General conditions for packaging

22

(1) Packagings shall be so closed and leakproof as to prevent any loss of the contents. The use of metal bands or wires to ensure closure is forbidden unless this procedure is specifically authorised in the regulations relating to the packing of the substances or articles in question.

(2) The materials of which the packagings and their closures are made must not be liable to attack by the contents or form harmful or dangerous compounds therewith.

(3) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. Solid substances shall be firmly secured in their packagings, and inner packagings shall be firmly secured in outer packagings. Unless otherwise specified in the section "Packing of individual substances", inner packagings may be enclosed in outer packagings, either singly or in groups.

(4) Bottles and other glass receptacles must be free from faults liable to impair their strength; in particular, internal stresses must have been suitably relieved. The thickness of the walls must in no case be less than 2 mm.

(5) Cushioning material shall be suited to the nature of the contents; in particular, it must be absorbent when the contents are liquid or might exude liquid.

2. *Packing of individual substances*

23

(1) Substances of items 1 and 2 shall be packed:

- (a) In wooden receptacles or in drums of waterproof fibreboard; these receptacles and drums shall, in addition, be fitted with a lining impermeable to the liquids they contain; their closure must be leakproof; or
- (b) In impermeable bags (e.g. made of rubber or of a suitable plastics material not readily inflammable) placed in a wooden case; or
- (c) In iron drums lined with zinc or lead; or
- (d) In receptacles made of tin plate or of zinc sheet or aluminium sheet which shall be secured by cushioning material in wooden cases.

(2) Metal receptacles must be fitted with closures or safety devices yielding when the internal pressure reaches a value not greater than 3 kg/cm<sup>2</sup>; the presence of these closures or safety devices must neither impair the strength of the receptacle nor impair its closure.

(3) Nitrocellulose of item 1, if it is wetted exclusively with water, may be packed in fibreboard drums; the fibreboard must have undergone special treatment to render it completely waterproof; the closure of the drums must be impermeable to water vapour.

(4) A package containing substances of item 1 must not weigh more than 120 kg or, if it can be rolled, not more than 300 kg; however, when in the form of a fibreboard drum, a package must not weigh more than 75 kg.

A package containing substances of item 2 must not weigh more than 75 kg.

24

(1) Substances of items 3 (a) and 4 shall be packed:

(a) If forwarded as a full wagon load

- 1. In drums of waterproof fibreboard; or
- 2. In packagings made of wood or of metal, the use of black sheet iron however not being accepted;

(b) If forwarded as less than a full wagon load

- 1. In boxes made of fibreboard, tin plate, zinc sheet or aluminium sheet, or of a suitable plastics material not readily inflammable, or in bags of closely woven textile, strong paper of at least two plies or strong paper lined with aluminium foil or a suitable plastics material. These packagings shall be placed in wooden cases; or
- 2. Without preliminary packing in boxes or in bags:
  - a. In drums of waterproof fibreboard or in wooden casks; or
  - b. In wooden packagings lined with zinc sheet or aluminium sheet; or
  - c. In receptacles made of metal, the use of black sheet iron however not being accepted.

(2) If the powder is in tubes, sticks, cords, bands or sheets it may also be enclosed in wooden cases without preliminary packaging in boxes or bags.

(3) Metal receptacles must be fitted with closures or safety devices yielding when the internal pressure reaches a value not greater than 3 kg/cm<sup>2</sup>; the presence of these closures or safety devices must neither impair the strength of the receptacle nor impair its closure.

(4) The closure of wooden cases may be ensured by means of bands or wires, made of a suitable metal, fastened tightly round them. If the bands or

wires are made of iron they shall be covered with a material not liable to produce sparks when subjected to impact or friction.

(5) A package must not weigh more than 120 kg; however, when in the form of a fibreboard drum, a package must not weigh more than 75 kg.

25

(1) Substances of items 3 (b) and 5 shall be packed:

(a) If forwarded as a full wagon load

1. In drums of waterproof fibreboard; or
2. In packagings made of wood or metal, the use of black sheet iron however not being accepted;

(b) If forwarded as less than a full wagon load

1. In boxes made of fibreboard, tinplate or aluminium sheet. Each box must not contain more than 1 kg of powder and must be wrapped in paper. These packagings shall be placed in wooden packagings; or
2. In bags made of closely woven textile, strong paper of at least two plies or strong paper lined with aluminium foil or a suitable plastics material. These bags shall be placed in drums made of fibreboard or wooden casks, or in other wooden packagings lined with zinc sheet or aluminium sheet or in receptacles made of zinc sheet or aluminium sheet. The interior of receptacles made of zinc sheet or aluminium sheet shall be completely lined with wood or fibreboard.

(2) Metal receptacles must be fitted with closures or safety devices yielding when the internal pressure reaches a value not greater than 3 kg/cm<sup>2</sup>; the presence of these closures or safety devices must neither impair the strength of the receptacle nor impair its closure.

(3) The closure of wooden cases may be ensured by means of bands or wires made of a suitable metal fastened tightly round them. If the bands or wires are made of iron they shall be covered with a material not liable to produce sparks when subjected to impact or friction.

(4) A package under (1) (a) must not weigh more than 100 kg; however, when in the form of a fibreboard drum, a package must not weigh more than 75 kg. A package under (1) (b) must not weigh more than 75 kg. It must not contain more than 30 kg of nitrocellulose powder.

26

(1) Substances of item 6 shall be packed in wooden receptacles. Drums of impervious fibreboard are also to be accepted for solid trinitrotoluene and trinitroanisole and iron receptacles for mixtures termed liquid trinitrotoluene.

(2) Metal receptacles must be fitted with closures or safety devices yielding when the internal pressure reaches a value not greater than 3 kg/cm<sup>2</sup>; the presence of these closures or safety devices must neither impair the strength of the receptacle nor impair its closure.

(3) A package must not weigh more than 120 kg or, when it can be rolled, not more than 300 kg; however, when in the form of a fibreboard drum, a package must not weigh more than 75 kg.

27

(1) Substances of item 7 shall be packed:

(a) Those of item 7 (a): in wooden receptacles or in drums of waterproof fibreboard. Lead and substances containing lead (alloys or compounds) must not be used in the packing of hexyl (hexanitrodiphenylamine) and picric acid.

Picric acid, in quantities not exceeding 500 grams per receptacle, may also be packed in receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, secured in a wooden case by

cushioning material (e.g. corrugated fibreboard). The receptacles must be closed by means of a stopper made of cork or rubber or of a suitable plastics material, which must be held in position by an additional device (cap, crown, seal, binding, etc.) capable of preventing any loosening of the closure system during carriage.

- (b) Those of item 7 (b) and (c): in quantities not exceeding 30 kg per bag in cloth bags which do not allow the contents to escape, or in strong paper bags or in bags of a suitable plastics material which shall be placed in leakproof wooden receptacles or in drums made of hardened fibreboard capable of being tightly closed and whose bottoms and lids shall be made of plywood. The lids of the cases shall be closed by means of screws and those of the drums by means of collars.

(2) A package containing substances of item 7 (a) must not weigh more than 120 kg when made of wood; in the form of a fibreboard drum, a package must not weigh more than 75 kg. Packages containing picric acid packed in fragile receptacles or in receptacles made of a plastics material must not weigh more than 15 kg. A package containing substances of item 7 (b) or (c) must not weigh more than 75 kg; cases which, with their contents, weigh more than 30 kg shall be fitted with means of handling.

28

(1) Substances and articles of item 8 shall be packed:

(a) If forwarded as a full wagon load

1. Those of item 8 (a): in receptacles made of steel not liable to rust or of any other suitable material (which specifically excludes lead and its alloys). Nitro-compounds shall be wetted so that during the entire journey the moisture content is at least 25% throughout the substance. Metal receptacles must be fitted with closures or safety devices yielding when the internal pressure reaches a value not greater than 3 kg/cm<sup>2</sup>; the presence of these closures or safety devices must neither impair the strength of the receptacle nor impair its closure. Receptacles, except those made of steel not liable to rust, shall be secured by cushioning material in wooden packagings;
2. Those of item 8 (b): in quantities not exceeding 15 kg per bag, in cloth bags or bags made of a suitable plastics material, placed in wooden packagings;
3. Those of item 8 (c): individually in strong paper and not more than 100 per box in sheet metal boxes. Not more than 100 of these boxes shall be placed in a wooden packing case;

(b) If forwarded as less than a full wagon load

1. Those of item 8 (a) and (b): in quantities not exceeding 500 g per receptacle in receptacles made of glass, porcelain, stoneware or similar materials or of a suitable plastics material, secured in a wooden case by cushioning material (e.g. corrugated fibreboard).

A package must not contain more than 5 kg of nitro-compounds.

Receptacles must be closed by means of a stopper made of cork or of rubber or of a suitable plastics material, which must be held in position by an additional device (cap, crown, seal, binding, etc.) capable of preventing any loosening of the closure system during carriage.

2. Tetryl [item 8 (b)]: in quantities not exceeding 15 kg per bag, in cloth bags or bags made of a suitable plastics material, placed in wooden packagings. A package must not contain more than 30 kg of tetryl;
3. Those of item 8 (c): as under (a) 3. above.

(2) A package under (1) (a) must not weigh more than 75 kg; it must not contain more than 25 kg of substances of item 8 (a) or more than 50 kg of substances of item 8 (b). A package under (1) (b) 2. or 3. not more than 40 kg.

29

(1) Substances and articles of item 9 shall be packed:

(a) If forwarded as a full wagon load

1. Those of item 9 (a) to (c):

a. In quantities not exceeding 10 kg per bag, in cloth bags or bags made of a suitable plastics material, placed in a waterproof fibreboard box or in a box made of tinplate or of aluminium sheet or zinc sheet; or

b. In quantities not exceeding 10 kg per receptacle, in fibreboard receptacles of adequate strength, impregnated with paraffin wax or rendered waterproof by some other means.

Boxes made of tinplate or of aluminium sheet or zinc sheet and boxes or receptacles of other types shall be placed in a wooden case lined with corrugated fibreboard; metal boxes shall be separated from one another by means of a corrugated fibreboard wrapping. Each case must not contain more than four boxes or other receptacles. The lids of the cases shall be closed by means of screws;

2. Penthrite [item 9 (a)]: either as in 1. above or under the following conditions: in quantities not exceeding 5 kg per receptacle, in receptacles made of glass, porcelain, stoneware, or similar materials or of a suitable plastics material, closed by means of a stopper made of cork or of rubber or of a suitable plastics material; each receptacle must be placed in a metal receptacle hermetically sealed by welding or soldering and cushioned with resilient materials so as to wedge the inner receptacle securely without leaving any empty spaces. Not more than 4 metal receptacles shall be packed in a wooden case lined with corrugated fibreboard and shall be separated from one another by several thicknesses of corrugated fibreboard or of any other substance capable of performing the same function;

3. Those of item 9 (d): first separately in strong paper and placed, in quantities not exceeding 3 kg per case, in fibreboard cases in which they shall be fixed in position by cushioning material; these cases, not more than 10 at a time, shall be secured by cushioning material in a wooden case, closed by means of screws, in such a manner that there is a space of 3 cm at least filled with cushioning material at all points between the fibreboard cases and the packing case;

(b) If forwarded as less than a full wagon load

1. Those of item 9 (a) to (c):

a. In quantities not exceeding 10 kg per bag, in bags, as in (a) 1. a. above; or

b. In quantities not exceeding 10 kg per receptacle, in receptacles, as in (a) 1. b. above;

c. Penthrite [item 9 (a)], either as in (a) and (b) above or under the conditions laid down in (a) 2. above or under the conditions laid down in d. below for hexogen;

d. Hexogen [item 9 (a)], either as in a. and b. above or under the following conditions: in quantities not exceeding 500 g dry weight per receptacle, in receptacles made of glass, porcelain, stoneware or similar materials or of a suitable plastics material, closed by means of a stopper made of cork or of rubber or of a suitable plastics material. These receptacles shall be placed in a wooden case. They shall be separated from one another by



means of a corrugated fibreboard wrapping and from the sides of the case by a space of at least 3 cm filled with cushioning material;

2. Those of item 9 (*d*): as in (*a*) 3. above. A package must not contain more than 25 kg of explosive substance.

(2) A package under (1) (*a*) must not weigh more than 75 kg; under (1) (*b*) 1. *a.* or *b.* not more than 60 kg, under *d.* not more than 10 kg and under *c.* and (1) (*b*) 2. not more than 35 kg. All packages under (1) (*b*) weighing more than 30 kg shall be fitted with means of handling.

- 30 (1) Substances of item 10 shall be packed in quantities not exceeding 500 g per bag, in bags made of a suitable pliant material with openings tightly tied; each bag shall be placed in a box made of metal, fibreboard or paperboard; these boxes, not exceeding 30 in number, shall be secured by cushioning material in a wooden packing case with complete panels at least 12 mm thick.

(2) A package must not weigh more than 25 kg.

- 31 (1) Substances and articles of Item 11 shall be packed:

(*a*) Those of item 11 (*a*) and (*b*):

1. In quantities not exceeding 2.5 kg per bag, in bags placed in boxes made of fibreboard, tinplate or aluminium. The boxes shall be secured by cushioning material in wooden packagings; or
2. In bags made of closely woven material placed in wooden casks or cases;

(*b*) Those of item 11 (*c*): rolled in strong paper; each roll must not weigh more than 300 g. The rolls shall be placed in a wooden case, lined with strong paper.

(2) The lids of the wooden cases shall be closed by means of screws; if the screws are made of iron they shall be covered with a material not liable to produce sparks when subjected to impact or friction.

(3) A package must not weigh more than 75 kg in the case of full wagon loads and not more than 35 kg in the case of less than full wagon loads.

- 32 (1) Substances of item 12 shall be cartridgeed in wrappings of a suitable plastics material or of paper. The cartridges may be dipped in paraffin wax, ceresine or resin or wrapped in a suitable plastics material in order to be protected against humidity. Explosives containing more than 6% liquid nitric esters must be cartridgeed in paper coated with paraffin wax or ceresine or in an impervious plastics material such as polyethylene. The cartridges shall be placed in wooden packagings.

(2) Cartridges not coated with paraffin wax or ceresine or cartridges in non-waterproof wrappings must be made up into packets weighing not more than 2.5 kg each. Packets so made up, whose wrapping must consist at least of strong paper, shall be dipped in paraffin wax, ceresine or resin or wrapped in a suitable plastics material in order to be protected against humidity. The packets shall be placed in wooden packagings.

(3) The closure of wooden packagings may be ensured by means of metal bands or wires fastened tightly round them.

(4) A package must not weigh more than 75 kg. It must not contain more than 50 kg of explosive substances.

(5) Instead of the wooden packagings prescribed in paragraph (1) and paragraph (2) it is also permissible to use suitable cases, made of solid fibreboard, or corrugated fibreboard, which are of sufficient mechanical strength and whose top and bottom flaps must be closed by means of sufficiently strong adhesive strips.

The design of cases made of solid fibreboard or corrugated fibreboard must be approved by the competent authority of the country of departure. Such a package must not weigh more than 30 kg; it must not contain more than 25 kg of explosives.

33 (1) Substances of item 13 shall be cartridge in paper wrappings. Cartridges not coated with paraffin wax or ceresine shall first be wrapped in impervious paper. They shall be made up, wrapped in paper, into packets weighing not more than 2.5 kg each, which shall be secured by cushioning material in wooden packagings, whose closure may be ensured by means of metal bands or wires fastened tightly round them.

(2) A package must not weigh more than 35 kg or more than 10 kg when in sample form.

34 (1) Substances of item 14 shall be packed:

(a) Those of item 14 (a): cartridge in impervious paper wrappings. The cartridges must be made up into packets in a paper wrapping or, if without a paper wrapping, must be secured by cushioning material in fibreboard cases. The packets or fibreboard cases shall be secured by inert cushioning material in wooden packagings, whose closure may be ensured by means of metal bands or wires fastened tightly round them;

(b) Those of item 14 (b): cartridge in impervious paper wrappings. The cartridges shall be placed in a fibreboard box. The fibreboard boxes, wrapped in impervious paper, shall be secured, leaving no empty spaces, in wooden packagings, whose closure may be ensured by means of metal bands or wires fastened tightly round them;

(c) Those of item 14 (c):

1. Cartridge in wrappings of a suitable plastics material or of paper. The cartridges may be dipped in paraffin wax, ceresine or resin or wrapped in a suitable plastics material in order to be protected against humidity. Explosives containing more than 6% liquid nitric esters must be cartridge in paper coated with paraffin wax or ceresine or in an impervious plastics material such as polyethylene. The cartridges shall be placed in wooden packagings;

2. Cartridges without paraffin or ceresine or cartridges in non-water-proofed cases shall be made up into packets weighing not more than 2.5 kg each. Packets so made up, whose wrapping must consist at least of strong paper, shall be dipped in paraffin wax, ceresine or resin or wrapped in a suitable plastics material in order to be protected against humidity. The packets shall be placed in wooden packagings;

3. The closure of wooden packagings may be ensured by means of metal bands or wires fastened tightly round them;

4. Instead of the packagings prescribed under 1. and 2. above, it is also permissible to use suitable cases, made of solid fibreboard or corrugated fibreboard, which are of sufficient mechanical strength and whose top and bottom flaps must be closed by means of sufficiently strong adhesive strips. The design of cases made of solid fibreboard or corrugated fibreboard must be approved by the competent authority of the country of departure.

(2) A package containing substances of item 14 (a) or (b) must not weigh more than 35 kg or more than 10 kg when in sample form. A package containing substances of item 14 (c) must not weigh more than 75 kg; it must not contain more than 50 kg of explosives; if the packaging is in accordance with (1) (c) 4., the package must not weigh more than 30 kg nor contain more than 25 kg of explosives.

### 3. *Mixed packing*

- 35 Substances listed under an item of marg. 21 may not be included in the same package either with substances grouped under the same or another item of that marginal, or with substances or articles of other Classes, or with other goods.

NOTE. Packages as referred to in marg. 28 (1) (b) 1. may contain organic nitro-compounds having different compositions and names.

### 4. *Marking and danger labels on packages* (see Appendix IX)

- 36 Packages containing picric acid [item 7 (a)] shall be marked with the name of the substance in clearly legible and indelible red characters. This marking shall be in an official language of the country of departure and also in French, German or Italian, unless the international tariffs or agreements concluded between the railway administrations provide otherwise.

- 37 (1) Packages containing substances and articles of Class I a shall bear labels conforming to model No. 1.

(2) Packages containing fragile receptacles not visible from the outside shall bear a label conforming to model No. 9. If the fragile receptacles contain liquids, the packages shall in addition, except in the case of sealed ampoules, bear labels conforming to model No. 8; these labels shall be affixed high up on two opposite sides of cases or in an equivalent manner when other packagings are used.

### B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

- 38 Substances of items 8 (a) and (b), 9 (a), (b) and (c), 13 and 14 (a) and (b) may not be forwarded otherwise than in full wagon loads. However, consignments in less than full wagon loads of not more than 300 kg of substances of item 8 (a) and (b) packed in conformity with the provisions of marg. 28 (1) (b) and of those of item 9 (a), (b) and (c) packed in conformity with the provisions of marg. 29 (1) are to be accepted, as also are consignments of samples not exceeding 100 kg of substances of items 13 and 14 (a) and (b) [see marg. 33 (2) and 34 (2)].

### C. PARTICULARS IN THE CONSIGNMENT NOTE

- 39 (1) The description of the goods in the consignment note must conform to one of the names printed in *italics* in marg. 21. Where item 8 (a) and (b) do not contain the name of the substance, the trade name must be used. The description of the goods must be *underlined in red* and followed by *particulars of the Class, the item number (together with the letter if any), and the initials "RID"* [e.g. *I a, item 3 (a), RID*].

(2) The sender must certify as follows in the consignment note: "*The nature of the goods and the packaging are in conformity with the provisions of RID*".

(3) In the case of substances which may not be accepted for forwarding otherwise than in full wagon loads, the consignment note shall show the weight of each package, in addition to the marks and numbers, the number of packages and the nature of the packing.

### D. TRANSPORT EQUIPMENT

#### 1. *Conditions relating to wagons and their loading*

##### a. *For packages*

- 40 (1) Substances of Class I a shall be loaded in covered wagons.

(2) Only wagons fitted with spring buffers and spring draw-gear, with solid and secure roofing without cracks, with tightly closing doors and ventilator shutters and, if possible, without brake mechanisms may be used in the case of substances which may not be forwarded otherwise than in full wagon loads. If

wagons with brake mechanisms are used, the brake mechanisms shall be disabled. No iron objects in the interior of the wagon other than those forming part of the construction of the wagon shall be allowed to protrude. The doors and ventilator shutters of the wagons shall be kept closed.

(3) Wagons whose sides are lined with lead, which have a lead framework or lead fittings or whose roof is covered with lead must not be used for the carriage of hexyl (hexanitrodiphenylamine) and picric acid [item 7 (a)] or soluble explosive organic nitro-compounds [item 8 (a)].

(4) As regards the use of electrically-fitted wagons, see Appendix IV.

- 41 (1) Packages shall be so stowed in wagons that they cannot shift. They shall be protected against any chafing or bumping. Casks, drums and receptacles of similar shape shall be laid on their sides with their longitudinal axis in the direction of the length of the wagon and secured against any sideways movement by wooden chocks. The gear required shall be supplied by the sender and handed over with the goods to the consignee.

(2) The following may be loaded in a wagon in less than full wagon loads: consignments of items 8 (a) and (b) and 9 (a), (b) and (c) which do not weigh more than 300 kg in all, and consignments of samples of substances of items 13 and 14 (a) and (b) which do not weigh more than 100 kg.

b. *For small containers*

- 42 (1) Packages containing substances set out in this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 44 must be applied to the contents of a small container and in a wagon carrying one or more small containers.

2. *Marking and danger labels on wagons and on small containers (see Appendix IX).*

- 43 (1) Wagons in which packages bearing labels conforming to model No. 1 are loaded shall bear similar labels on both sides of the wagon.

(2) Small containers in which substances of this Class are loaded shall bear a label conforming to model No. 1.

Small containers enclosing packages bearing a label conforming to model No. 9 shall also bear this label.

E. PROHIBITIONS ON MIXED LOADING

- 44 (1) Substances and articles of Class I a must not be loaded in the same wagon together:

(a) With articles of Class I b, items 1 (d), 3, 4 (c), 4 (d), 5, 6 and 8 to 11 (marg. 61);

(b) With articles of Class I c, items 1, 2, 4 to 6, 7 (b) and 8 to 27 (marg. 101);

(c) With substances of Class I d (marg. 131);

(d) With substances of Class I e (marg. 181);

(e) With substances of Class II (marg. 201);

(f) With substances of Class III a (marg. 301);

(g) With substances of Class III b (marg. 331);

(h) With substances of Class III c (marg. 371);

(i) With substances of Class IV a (marg. 401);

- (k) With substances of Class IV b (marg. 451);
- (l) With substances of Class V (marg. 501);
- (m) With substances of Class VII (marg. 701).

(2) Hexyl (hexanitrodiphenylamine) and picric acid [item 7 (a)] and soluble explosive organic nitro-compounds [item 8 (a)] must not be loaded in the same wagon together with substances and articles containing lead, lead alloys or lead compounds.

(3) Among the substances of Class I a, the chlorate explosives of item 13 must not be loaded in the same wagon together with explosives having an ammonium nitrate base of items 12 (a) and 14 (c).

- 45 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon [art. 6, para. 10 (d) of CIM].

#### F. EMPTY PACKAGINGS

- 46 (1) Packagings of item 15 must be securely closed and be leakproof in the same degree as though they were full.

(2) The description in the consignment note must read: "*Empty packaging, I a, item 15, RID*". This description must be *underlined in red*.

#### G. OTHER REGULATIONS

- 47 Hexyl (hexanitrodiphenylamine) and picric acid [item 7 (a)] and soluble explosive organic nitro-compounds [item 8 (a)] shall be kept apart in goods depots from lead and lead receptacles.

48-59

### CLASS I b. ARTICLES FILLED WITH EXPLOSIVE SUBSTANCES

#### 1. List of articles

- 60 (1) Among the articles covered by the heading of Class I b, only those listed in marg. 61 are to be accepted for carriage, and then only subject to the conditions laid down in marg. 60 (2) to 84. These articles to be accepted for carriage under certain conditions are to be considered as articles of RID.

(2) If the articles listed under items 7, 10 or 11 of marg. 61 are composed of, or filled with, explosive substances listed in marg. 21, those substances must satisfy the stability and safety conditions prescribed for them in Appendix I.

- 61 1. Fuses, not primed:

- (a) *Rapid combustion fuses* (fuses consisting of a thick tube with a core of black powder, or with a core of threads impregnated with black powder, or with a core of nitrated cotton threads);
- (b) *Detonating fuses* in the form of small-section *metal* tubes with thin walls and a core filled with explosive substance; see also Appendix I, marg. 1108;
- (c) *Flexible detonating fuses* wrapped in textile or in a plastics material, of small section, with a core filled with explosive substance; see also Appendix I, marg. 1109;
- (d) *Instantaneous detonating fuses* (small-section woven fuses with a core filled with explosive substance more dangerous than penthrite).

For other fuses, see Class I c (marg. 101, item 3).

2. Non-detonating primers (primers which do not produce a disruptive effect either with the aid of detonators or by other means):

- (a) *Percussion caps*;
- (b) 1. *Primed cases of central-percussion cartridges*, not filled with propellant powder, for firearms of all calibres;
- 2. *Primed cases of rim-fire cartridges*, not filled with propellant powder, for Flobert weapons and firearms of similar calibres;
- (c) *Quick-matches, screw-primers* and other similar *primers containing a small charge* (black powder or other explosives), set in action by friction, percussion or electricity;
- (d) *Fuses without any device* (e.g. detonator) producing a disruptive effect and without a transmission charge.
  - 3. *Railway fog signals*.
  - 4. *Small-arms cartridges* [with the exception of those containing a bursting charge (see under item 11)] :
    - (a) *Sporting cartridges*;
    - (b) *Flobert cartridges*;
    - (c) *Tracer cartridges*;
    - (d) *Incendiary cartridges*;
    - (e) *Other central-percussion cartridges*.

NOTE. Apart from sporting cartridges with lead pellets, only cartridges whose calibre does not exceed 13.2 mm are considered as articles of item 4.

5. Detonating fuses:

- (a) *Detonators with or without a delayed-action device; delayed-action connecting pieces for detonating fuses*;
- (b) *Electric detonators fitted with fuses with or without a delayed-action device*;
- (c) *Detonators connected firmly to a black-powder fuse*;
- (d) *Detonators with gaines* (detonators combined with a transmission charge composed of a compressed explosive); see also Appendix I, marg. 1110;
- (e) *Fuses with detonators (fused detonators)* with or without a transmission charge;
- (f) *Detonators with percussion cap* (“*bouchons allumeurs*”) with or without a delayed-action device, with or without a mechanical device for firing and without a transmission charge.

6. *Sounding caps* (detonators with or without primers, contained in sheet-metal tubes).

7. *Articles with a propellant charge*, other than those listed under item 8; *articles with a bursting charge; articles with propellant and bursting charges*; provided that they contain only explosive substances of Class I a, all without a device producing a disruptive effect (e.g. detonator). The charge in these articles may comprise a tracer (see also under items 8 and 11).

NOTE. Non detonating primers (item 2) are allowed in these articles.

8. *Articles filled with substances intended for lighting or intended for signalling* with or without a propellant charge, with or without an ejection charge and without a bursting charge, in which the propellant or tracer substance is compressed in such a way that the articles cannot explode when ignited.

9. *Smoke-producing devices* containing chlorates or carrying an explosive charge or an explosive ignition charge.

For smoke-producing substances for agricultural and forestry purposes, see Class I c, marg. 101, item 27.

10. *Boring devices* containing a charge of dynamite or of an explosive similar to dynamite without fuses and without any device producing a disruptive effect (e.g. detonator), *hollow-charge devices* for commercial purposes, containing not more than 1 kg of explosive secured within the casing and without a detonator.

11. *Articles with a bursting charge, articles with propellant and bursting charges*, fitted with a device producing a disruptive effect (e.g. detonator), the whole well secured. The weight of each article must not exceed 25 kg.

## 2. *Conditions of carriage*

### A. PACKAGES

#### 1. *General conditions for packing*

62 (1) Packagings shall be so closed and leakproof as to prevent any loss of the contents. The use of metal bands or wires fastened tightly round to ensure the closure of packages is allowed; their use is compulsory when cases with hinged lids are used, if these are not fitted with an effective device to obviate any loosening of the closure.

(2) The materials of which the packagings and their closures are made must not be liable to attack by the contents or form harmful or dangerous compounds therewith.

(3) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. Articles shall be firmly secured in their packagings and inner packagings shall be firmly secured in outer packagings. Unless otherwise specified in the section "Packing of articles of the same kind", inner packagings may be enclosed in outer packagings, either singly or in groups.

(4) Cushioning material shall be suited to the nature of the contents.

#### 2. *Packing of articles of the same kind*

63 Articles of item I shall be packed as follows:

(a) Those of item I (a) and (b): in wooden packagings or in drums of waterproof fibreboard. A package must not weigh more than 120 kg; if, however, a fibreboard drum is used, the package must not weigh more than 75 kg;

(b) Those of item I (c): rolled in lengths of up to 250 m on reels made of wood or fibreboard. The reels shall be placed in wooden cases so that they cannot come into contact either with one another or with the sides of the cases. A case must not contain more than 1,000 m of fuse;

(c) Those of item 1 (d): rolled in lengths of up to 125 m on reels made of wood or fibreboard, which shall be so placed in a wooden case, closed by means of screws and with sides at least 18 mm thick, that the rolls cannot come into contact either with one another or with the sides of the case. A case must not contain more than 1,000 m of instantaneous denoting fuse.

64 (1) Articles of item 2 shall be packed as follows:

(a) Those of item 2 (a): caps with an uncovered explosive charge, in quantities not exceeding 500 per box or small case, and caps with a covered explosive charge, in quantities not exceeding 5,000 per box or small case, in sheet-metal

boxes, fibreboard boxes or small wooden cases. These packagings shall be placed in a packing case made of wood or sheet metal;

- (b) Those of item 2 (b) 1.: primed cases of central-percussion cartridges, not filled with propellant powder, for firearms of all calibres, in cases made of wood or fibreboard or in textile bags;
- (c) Those of item 2 (b) 2.: primed cases of rim-fire cartridges, not filled with propellant powder, for Flobert weapons and firearms of similar calibres, in quantities not exceeding 5,000 per box, in boxes made of sheet metal or fibreboard, which shall be placed in a packing case made of wood or metal; however, these primed cases for rim-fire cartridges may also be packed in quantities not exceeding 25,000, in a bag which must be secured in a packing case made of wood or iron by means of corrugated fibreboard;
- (d) Those of item 2 (c) and (d): in boxes made of fibreboard, wood or sheet metal which shall be placed in packagings made of wood or metal.

(2) A package containing articles of item 2 (a), (c) or (d) must not weigh more than 100 kg.

- 65 (1) Articles of item 3 shall be packed in cases made of boards at least 18 mm thick, tongued and grooved and assembled by means of wood screws. Fog signals shall be so secured in cases by cushioning material that they cannot come into contact either with one another or with the sides of the case.

(2) A package must not weigh more than 50 kg.

- 66 (1) Articles of item 4 (a), (b) and (e) shall be packed tightly in tightly closing boxes made of sheet metal, wood or fibreboard; these boxes shall be housed, leaving no empty spaces, in packing cases made of metal, wood, paperboard, solid fibreboard or corrugated fibreboard; the fibreboard must be waterproofed by impregnation and be of sufficient mechanical strength.

The fibreboard cases shall be closed by means of sufficiently strong gummed strips. The design of cases made of solid fibreboard or corrugated fibreboard must be approved by the competent authority of the country of departure.

(2) Articles of item 4 (c) and (d) shall be placed in quantities not exceeding 400 per box, in boxes made of sheet metal, wood or fibreboard; these boxes shall be packed securely in packing cases made of metal or wood.

(3) A package must not weigh more than 100 kg; however, when in the form of a paperboard or fibreboard case, a package containing articles of item 4 (a), (b) or (e) must not weigh more than 40 kg.

- 67 (1) Articles of item 5 shall be packed as follows:

(a) Those of item 5 (a): in quantities not exceeding 100 in the case of detonators and 50 in the case of connecting pieces, well protected against ignition and secured by cushioning material, in receptacles made of sheet metal or waterproof fibreboard. Sheet-metal receptacles shall be lined with a resilient material. The lids shall be secured all round by gummed strips. The receptacles shall be made up into a packet or placed in a fibreboard box in quantities not exceeding 5 in the case of detonators, and 10 in the case of connecting pieces. The packets or boxes shall be packed in a wooden case, closed by means of screws, and with sides at least 18 mm thick, or in a sheet-metal packaging, either of which shall be so secured by cushioning material, in a packing case whose sides shall be at least 18 mm thick, that there is a space of 3 cm at least filled with cushioning material at all points between the wooden case or the sheet-metal packaging and the packing case;

(b) Those of item 5 (b): in quantities not exceeding 100 per packet in such a way that the detonators shall be placed alternately at each end of the packet.



Not more than 10 of these packets shall be tied together to form a larger packet. Not more than 5 of these larger packets shall be so secured by cushioning material, in a wooden packing case whose sides shall be at least 18 mm thick, or in a sheet-metal packaging, that there is a space of 3 cm at least filled with cushioning material at all points between the larger packets and the packing case or the sheet-metal packaging;

- (c) Those of item 5 (c): fuses fitted with detonators, coiled up; not more than 10 coils shall be made up into a reel which shall be wrapped in paper. Not more than 10 reels shall be secured by cushioning material in a small wooden case, closed by means of screws and with sides at least 12 mm thick. The small cases, in quantities not exceeding 10, shall be so secured by cushioning material, in a packing case whose sides shall be at least 18 mm thick, that there is a space of 3 cm at least filled with cushioning material at all points between the small cases and the packing case;
- (d) Those of item 5 (d):
1. In quantities not exceeding 100 detonators per case in wooden cases whose sides shall be at least 18 mm thick, in such a manner that they are at least 1 cm apart from one another and from the sides of the case. The sides of the case shall be mortised and the bottom and the lid fixed on by means of screws. If the case is lined with zinc sheet or aluminium sheet a side thickness of 16 mm is sufficient. This case shall be so secured by cushioning material, in a packing case whose sides shall be at least 18 mm thick, that there is a space of 3 cm at least of cushioning material at all points between it and the packing case; or
  2. In quantities not exceeding 5 detonators per box in sheet-metal boxes, the detonators being placed in slatted wooden frames or in perforated pieces of wood. The lid shall be secured all round by gummed strips. Not more than 20 sheet metal boxes shall be placed in a packing case whose sides shall be at least 18 mm thick;
- (e) Those of item 5 (e): in quantities not exceeding 50 per case in wooden cases whose sides shall be at least 18 mm thick. The articles shall be secured within the cases by means of a wooden structure in such a manner that they shall be at least 1 cm apart from one another and from the sides of the case. The sides of the case shall be mortised and the bottom and the lid fixed on by means of screws. Not more than 6 cases shall be so secured by cushioning material, in a packing case whose sides shall be at least 18 mm thick, that there is space of 3 cm at least filled with cushioning material at all points between the cases and the packing case. The space may be reduced to at least 1 cm if it is filled with porous wood-fibre slabs. If the articles are packed individually and immobilised in boxes made of sheet metal or of a plastics material closing hermetically, they may be placed in a wooden packing case whose sides shall be at least 18 mm thick. The articles must be separated from one another, and immobilised by fibreboard or by wood-fibre slabs;
- (f) Those of item 5 (f):
1. In quantities not exceeding 50 per case, in wooden cases or in metal cases; in these cases each detonating part of the "*bouchon allumeur*" shall be so arranged on a slotted wooden support that the distance between two adjacent detonators and between the end detonators and the sides of the case is at least 2 cm; closing the lid of the case shall ensure complete immobility of the whole; not more than 3 cases shall be placed, leaving no empty spaces, in a wooden packing case whose sides shall be at least 18 mm thick; or

2. In boxes made of wood or metal; in these boxes each “*bouchon allumeur*” shall be so supported by a frame that the distance between two “*bouchons allumeurs*” and between a “*bouchon allumeur*” and the side of the box is at least 2 cm and the immobility of the whole is ensured; these boxes shall be so secured by cushioning material, in a packing case whose sides shall be at least 18 mm thick, that there is a space of 3 cm at least filled with cushioning material at all points between the boxes and between the boxes and the packing case; a package must not contain more than 150 “*bouchons allumeurs*”.
- (2) The lid of the packing case shall be closed by means of screws or by hinges and folding bars.
- (3) Each package containing articles of item 5 shall be provided with a closure ensured either by lead or by seals (stamp or mark) applied to two screw-heads at the ends of the major axis of the lid or to the ends of the folding bars, or by a strip bearing the trade mark and gummed on the lid and on two opposite sides of the case.
- (4) A package must not weigh more than 75 kg; packages weighing more than 30 kg shall be fitted with means of handling.
- 68 (1) Articles of item 6 shall be rolled individually in paper and wrapped in corrugated fibreboard. They shall be packed, in quantities not exceeding 25 per box, in boxes made of fibreboard or sheet metal. The lids shall be secured all round by gummed strips. Not more than 20 boxes shall be placed in a wooden packing case.
- (2) A package must not weigh more than 50 kg. Packages which weigh more than 30 kg shall be fitted with means of handling.
- 69 (1) Articles of item 7 shall be packed in wooden cases, closed by means of screws or by hinges and folding bars and with sides at least 16 mm thick, or in receptacles made of metal or of a suitable plastics material of adequate strength. The lid and the bottom of the wooden cases may also be made of highly compressed paperboard equalling the sides in strength. Articles weighing more than 20 kg may also be forwarded in crates or without packaging.
- (2) A package must not weigh more than 100 kg if it contains articles each of which weighs not more than 1 kg. Cases which, with their contents, weigh more than 30 kg shall be fitted with means of handling.
- 70 (1) Articles of item 8 shall be packed in wooden cases, in drums of water-proofed fibreboard, or in receptacles made of metal or of a suitable plastics material of adequate strength. The ignition head shall be protected so as to prevent any scattering of the charge from the article.
- (2) A package must not weigh more than 100 kg; however, in the form of a fibreboard drum a package must not weigh more than 75 kg. Cases which, with their contents, weigh more than 30 kg shall be fitted with means of handling.
- 71 Articles of item 9 shall be enclosed in wooden packagings. A package must not weigh more than 75 kg; packages which weigh more than 30 kg shall be fitted with means of handling.
- 72 Articles of item 10 shall be packed in wooden cases. Packages which weigh more than 30 kg shall be fitted with means of handling.
- 73 Articles of item 11 shall be packed as follows:
- (a) Articles less than 13.2 mm in diameter in quantities not exceeding 25 per box, packed tightly in tightly closing fibreboard boxes, or in receptacles made of a suitable plastics material of adequate strength; these boxes or receptacles shall be placed, leaving no empty spaces, in a wooden case whose sides shall

be at least 18 mm thick; this case may be lined with tinplate, zinc sheet, or aluminium sheet or a suitable plastics or similar material of adequate strength.

A package must not weigh more than 60 kg. Packages weighing more than 30 kg shall be fitted with means of handling;

(b) Articles from 13.2 mm up to 57 mm in diameter:

1. Individually in a tube made of fibreboard or of a suitable plastics material, strong, well-fitting and closing tightly at both ends; or

Individually in a tube made of fibreboard or of a suitable plastics material, strong, well-fitting, closed at one end and open at the other; or

Individually in a tube made of fibreboard or of a suitable plastics material, open at both ends but with an inner projection or other suitable device to prevent the article from moving.

Packed in this manner, not more than:

300 articles from 13.2 mm to 21 mm in diameter, or

60 articles over 21 mm to 37 mm in diameter, or

25 articles over 37 mm to 57 mm in diameter,

shall be placed in layers in a wooden case whose sides shall be at least 18 mm thick and which shall be lined with tinplate, zinc sheet or aluminium sheet.

In the case of articles packed in tubes open at both ends or at one end, the packing case shall be lined on the sides at the open ends of the tubes either with a felt pad at least 7 mm thick, or with a sheet of the same thickness of double corrugated fibreboard or similar material.

A package must not weigh more than 100 kg. Packages weighing more than 30 kg shall be fitted with means of handling;

2. Articles of 20 mm in diameter in quantities not exceeding 10 per box may also be packed in well-fitting fibreboard boxes which shall be strong, coated with paraffin wax, fitted with a honey-combed bottom insert and with partitions made of fibreboard coated with paraffin wax. The boxes shall be closed by a gummed flap;

Not more than 30 boxes shall be packed tightly in a wooden case whose sides shall be at least 18 mm thick and which shall be lined with tinplate, zinc sheet or aluminium sheet.

A package must not weigh more than 100 kg. Packages weighing more than 30 kg shall be fitted with means of handling;

3. Articles with a diameter equal to or less than 30 mm may also be put on to belts in numbers of pieces which shall not exceed that indicated in 1. and packed in a strong steel receptacle. This receptacle may be cylindrical.

These articles put on to belts shall be surrounded by a suitable device so as to constitute a compact whole and to prevent individual articles from becoming detached. One or more units shall be so fixed in the receptacle that they cannot become displaced.

The ends of articles put on to belts shall rest on shock-absorbing, non-metallic sheets.

The cover of the receptacle must be tightly closed and secured by a locking device capable of being sealed so that the articles cannot fall out.

A package must not weigh more than 100 kg. Packages weighing more than 30 kg shall be fitted with means of handling. Receptacles capable of being rolled shall have their lids fitted with a strong handle allowing them to be carried;

4. Articles from 30 mm up to 57 mm in diameter may also be packed individually in a strong, well-fitting cylindrical box, which shall be hermetically closed and made of fibreboard, paperboard or a suitable plastics material. The boxes shall be placed in quantities not exceeding 40 in layers in a wooden case whose sides shall be at least 18 mm thick.

A package must not weigh more than 100 kg. Packages which weigh more than 30 kg shall be fitted with means of handling;

- (c) Other articles of item 11: in accordance with the regulations of marg. 69 (1). A package must not weigh more than 100 kg. Packages weighing more than 30 kg shall be fitted with means of handling.

NOTE. For articles containing both propellant and bursting charges, the diameter must be related to the cylindrical portion of the articles containing the bursting charge.

### 3. *Mixed packing*

- 74 Articles listed under an item of marg. 61 may not be included in the same package either with articles of a different kind listed under the same item, or with articles listed under another item of that marginal, or with substances or articles belonging to other Classes, or with other goods.

The following may, however, be included in the same package:

- (a) Articles of item 1 with one another, namely:

Those of item 1 (a) and (b) packed in conformity with marg. 63 (a).

When articles of item 1 (c) are included in the same package with articles of item 1 (a) or (b), or both, those of item 1 (c) must be packed in conformity with the regulations laid down for them and the packing case must be that prescribed for articles of item 1 (a) or (b). A package must not weigh more than 120 kg;

- (b) Articles of item 2 (a) with those of item 2 (b), provided that both are contained in inner packagings consisting of boxes placed in wooden cases. A package must not weigh more than 100 kg;
- (c) Articles of item 4 with one another, taking into account the regulations for inner packing, in a wooden packing case. A package must not weigh more than 100 kg;
- (d) Articles of item 7 with those belonging to item 5 (a), (d), (e) and (f), on condition that the packing of the latter prevents the transmission of possible explosion to articles of item 7. In a package, the number of articles of item 5 (a), (d), (e) or (f) must be the same as that of the articles of item 7. A package must not weigh more than 100 kg.

### 4. *Marking and danger labels on packages* (see Appendix IX)

- 75 Packages containing articles of Class I b shall bear labels conforming to model No. 1.

## B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

- 76 (1) Articles of items 3 and 5 may not be forwarded by *grande vitesse* otherwise than in full wagon loads; articles of items 10 and 11 are excluded from *grande vitesse* carriage; they may not be forwarded by *petite vitesse* otherwise than in full wagon loads. Articles of item 7 may be handed over in less than full

wagon loads for carriage by *grande vitesse* if in quantities not exceeding 5 per package.

(2) Articles of item 4 (a) and (b) may also be forwarded as express parcels; in such cases, a package must not weigh more than 40 kg.

C. PARTICULARS IN THE CONSIGNMENT NOTE

77 (1) The description of the goods in the consignment note must conform to one of the names printed in *italics* in marg. 61; it must be *underlined in red* and followed by *particulars of the Class, the item number (together with the letter, if any), and then initials "RID"* [e.g. *I b, item 2 (a), RID*].

(2) The sender must certify as follows in the consignment note: "*The nature of the goods and the packaging are in conformity with the provisions of RID*".

D. TRANSPORT EQUIPMENT

1. *Conditions relating to wagons and their loading*

a. *For packages*

78 (1) Articles of Class I b shall be loaded in covered wagons.

(2) Unpacked articles of item 7 shall be so placed in the wagons that they cannot shift.

(3) In the case of *grande vitesse* consignments forwarded in less than full wagon loads, a single package of articles of item 7 may be loaded in a wagon.

(4) Only covered wagons fitted with spring buffers and spring draw-gear, with solid and secure roofing without cracks, with tightly closing doors and ventilator shutters and, if possible, without brake mechanisms may be used in the case of articles of items 10 and 11. If wagons with brake mechanisms are used, the brake mechanisms shall be disabled. No iron objects in the interior of the wagon other than those forming part of the wagons shall be kept closed.

(5) Packages containing articles of items 10 and 11 shall be so stowed in the wagons that they cannot shift. They shall be protected against any chafing or bumping.

(6) As regards the use of electrically-fitted wagons, see Appendix IV.

b. *For small containers*

79 (1) Packages containing articles set out in this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 81 must be applied to the contents of a small container and in a wagon carrying one or more small containers.

2. *Marking and danger labels on wagons and on small containers* (see Appendix IX).

80 (1) Wagons in which packages containing articles of Class I b are loaded shall bear on both sides a label conforming to model No. 1.

(2) Small containers in which articles of this Class are loaded shall bear a label conforming to model No. 1.

E. PROHIBITIONS ON MIXED LOADING

81 (1) Articles of Class I b must not be loaded in the same wagon together:

(a) With fluorine of Class I d, item 3 (marg. 131);

(b) With substances of Class I e (marg. 181);

- (c) With substances of marg. 201, items 3, 4 and 11, or with any other substances of Class II if their outer packaging does not consist of metal receptacles;
- (d) With substances of Class III c (marg. 371);
- (e) With substances of Class IV a, item 5 (marg. 401);
- (f) With substances of Class IV b (marg. 451); however, packages containing articles of item 4 (a) and (b), forwarded as express parcels, may be loaded in the same wagon together with packages containing radioactive substances in type-A packaging;
- (g) With substances of Class V, items 2 (a) and 3 (a) (marg. 501);
- (h) With substances of Class VII (marg. 701).

(2) Articles of items I (d), 3, 4 (c) and (d), 5, 6 and 8 to 11 must not be loaded in the same wagon together with substances and articles of Class I a (marg. 21).

(3) Articles of items I (d), 3, 5, 10 and 11 must not be loaded in the same wagon together:

- (a) With articles of Class I b, item 6 (marg. 61);
- (b) With substances of Class III a (marg. 301).

(4) The following shall not be loaded together in the same wagon:

- (a) Articles of items I (d), 3 and 5 with articles of Class I b, items 7, 8 and 11 (marg. 61);
- (b) Articles of item 10 with articles of Class I b, items 3, 5, 7, 8 and 11 (marg. 61);
- (c) Articles of item 11 with articles of Class I b, items 3, 5, 7, 8 and 10 (marg. 61).

82 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon [art. 6, para. 10 (d), of CIM].

#### F. EMPTY PACKAGINGS

83 No regulations.

#### G. OTHER REGULATIONS

84 No regulations.

85-99

### CLASS I c. IGNITERS, FIREWORKS AND SIMILAR GOODS

#### 1. *List of goods*

100 (1) Among the substances and articles covered by the heading of Class I c, only those listed in marg. 101 are to be accepted for carriage and then only subject to the conditions laid down in marg. 100 (2) to 121. These substances and articles to be accepted for carriage under certain conditions are to be considered as substances and articles of RID.

(2) As regards their make-up, articles to be accepted must fulfil the following conditions:

- (a) The explosive charge shall be constituted, arranged and distributed in such a manner that neither friction, jarring, shock nor ignition of the packed articles can lead to an explosion of the whole contents of the package.
- (b) White or yellow phosphorus must not be used except in articles of items 2 and 20.

- (c) The detonating part of fireworks (items 21 to 24), flash powders (item 26) and the smoke-producing part of pesticides (item 27) must not contain chlorates.
- (d) The explosive charge must satisfy the stability conditions of Appendix I, marg. 1111.

## 101

## A. IGNITERS:

1. (a) *Safety matches* (with a potassium-chlorate and sulphur base);  
(b) *Matches with a base* of potassium chlorate and of *phosphorus sesqui-sulphide*, also *friction igniters*.
2. *Strips of amorces* for safety lamps and *strips of paraffin-waxed amorces* for safety lamps. 1,000 amorces must not contain more than 7.5 g of explosives.

For strips of caps, see under item 15.

3. *Slow-combustion fuses* (fuses consisting of a thin leakproof tube with a narrow-section core of black powder).  
For other fuses, see Class I b, marg. 61, item 1.
4. *Pyroxylin thread (nitrated cotton thread)*. See also Appendix I, marg. 1101.
5. *Tubular igniters* ("lances d'allumage") (tubes made of paper or fibreboard containing a small quantity of a fuse composition of oxygenated and organic substances and, possibly, of nitrated aromatic compounds) and *thermite caps* with pellet igniters.
6. *Safety igniters* for fuses (paper cartridges containing a percussion cap pierced by a thread intended to cause friction or tearing, or similar devices).
7. (a) *Electric primers* without detonators;  
(b) *Pellets for electric primers*.
8. *Electric igniters* (e.g. igniters intended for lighting photographic magnesium powders). The charge of each igniter must not exceed 30 mg, or contain more than 10% fulminate of mercury.

NOTE. Appliances producing a sudden light as do electric bulbs and containing an ignition charge similar to that of electric igniters are not subject to the provisions of RID.

## B. PYROTECHNIC ARTICLES AND TOYS; CAPS AND STRINGS OF CAPS; DETONATING ARTICLES:

9. *Indoor pyrotechnic articles* (e.g. Bosco cylinders, confetti bombs, cotillon fruits). Articles with a nitrated-cotton base (collodion cotton) must not contain more than 1 g thereof per article.
10. *Fulminating bonbons, flower crackers, strips of nitrated paper* (collodion paper).
11. (a) *Fulminating peas, fulminating grenades* and other similar *pyrotechnic toys* containing fulminate of silver;  
(b) *Fulminating matches*;  
(c) *Accessories with fulminate of silver*.  
Re (a), (b) and (c): 1,000 articles must not contain more than 2.5 g of fulminate of silver.
12. *Detonating pebbles*, each carrying on the outside a charge of not more than 3 g of explosive other than fulminate.
13. *Pyrotechnic matches* (e.g. Bengal matches, golden-rain matches or cascade-of-flowers matches).

14. *Miracle candles* without ignition heads.
  15. *Caps* for children's toys, *strips of caps* and *rings of caps*. 1,000 caps must not contain more than 7.5 g of an explosive free from fulminate.  
For strips of caps for safety lamps, see under item 2.
  16. *Explosive corks* with an explosive charge having a phosphorus and chlorate base or with a charge of fulminate or a similar compound compressed into cardboard cartridge. 1,000 corks must not contain more than 60 g of chlorate explosive or more than 10 g of fulminate or of a compound with a fulminate base.
  17. *Round petards* containing an explosive charge with a phosphorus and chlorate base. 1,000 petards must not contain more than 45 g of explosive.
  18. *Cardboard caps (toy ammunition)* with an explosive charge having a phosphorus and chlorate base or with a charge of fulminate or a similar compound. 1,000 caps must not contain more than 25 g of explosive.
  19. *Cardboard caps exploding under foot*, with a protected charge having a phosphorus and chlorate base. 1,000 caps must not contain more than 30 g of explosive.
  20. (a) *Detonating sheets*,  
(b) *Martinikas* (so-called *Spanish fireworks*),  
both consisting of a mixture of white (yellow) and red phosphorus with potassium chlorate and not less than 50% inert substances not taking part in the decomposition of the mixture of phosphorus and chlorate. A sheet must not weigh more than 2.5 g and a martinika not more than 0.1 g.
- C. FIREWORKS:
21. *Anti-hail rockets* not fitted with a detonator, *bombs* and *firepots*. The charge, including the propellant charge, must not weigh more than 14 kg per article, the bomb or the firepot not more than 18 kg in all.
  22. *Incendiary bombs, rockets, Roman candles, fountains, wheels* and similar *fireworks*, with a charge not weighing more than 1,200 g per article.
  23. *Cannon shots* each containing not more than 600 g of granulated black powder or 220 g of explosives not more dangerous than aluminium powder with potassium perchlorate, *rifle shots (crackers)* each containing not more than 20 g of granulated black powder, all provided with fuses with covered ends, and similar *articles for producing a loud detonation*.  
For railway fog signals, see Class I b, marg. 61, item 3.
  24. *Small fireworks* (e.g. jumping crackers, serpents, golden rain, silver rain, if they contain not more than 1,000 g of granulated black powder per 144 articles; volcanoes and hand comets, if they contain not more than 30 g each of granulated black powder).
  25. *Bengal fires* without ignition heads (e.g. Bengal torches, lights, flames).
  26. *Magnesium-flash powders*, in quantities of 5 g at the most, in paper bags or in small glass tubes.
- D. PESTICIDES (SUBSTANCES AND ARTICLES):
27. *Smoke-producing substances* for agricultural and forestry purposes, and *smoke-producing cartridges* for use as pesticides.  
For smoke-producing devices containing chlorates or carrying an explosive charge or an explosive ignition charge, see Class I b, marg. 61, item 9.



## 2. *Conditions of carriage*

### A. PACKAGES

#### 1. *General conditions for packing*

102 (1) Packagings shall be so closed and leakproof as to prevent any loss of the contents.

(2) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. Articles shall be firmly secured in their packagings, and inner packagings shall be firmly secured in outer packagings. Unless otherwise specified in the section "Packing of individual substances and of articles of the same kind", inner packagings may be enclosed in outer packagings, either singly or in groups.

(3) Cushioning material shall be suited to the nature of the contents.

#### 2. *Packing of individual substances and of articles of the same kind*

103 (1) Articles of item 1 (a) shall be packed in boxes or in books. These boxes or books shall be wrapped in stout paper to form a larger packet all the folds of which shall be glued. The books may also be placed in boxes made of thin fibreboard or of a material not readily inflammable (e.g. cellulose acetate). The fibreboard boxes or the larger packets shall be placed in a strong case made of wood, metal, compressed-wood panels or of solid fibreboard or double-faced corrugated fibreboard.

All joints of metal cases shall be secured by soft-soldering or by double-seaming.

Fibreboard cases shall be closed by means of joined flaps. The edges of the outer flaps and all joints must be either glued or tightly closed by some other suitable means.

If the fibreboard boxes or the larger packets are packed in fibreboard cases, the weight of a package may not exceed 20 kg.

(2) Articles of item 1 (b) shall be so packed in boxes as to prevent any movement. Not more than 12 of these boxes shall be included in a packet all the folds of which shall be glued.

Not more than 12 of these packets wrapped in stout paper, the folds of which shall be glued, shall form a larger packet. The larger packets shall be placed in a strong case made of wood, metal, compressed-wood panels or of solid fibreboard or double-faced corrugated fibreboard.

All joints of metal cases shall be secured by soft-soldering or by double-seaming.

Fibreboard cases shall be closed by means of joined flaps. The edges of the outer flaps, as well as all joints, must be either glued or tightly closed by some other suitable means.

If the larger packets are packed in fibreboard cases, the weight of a package must not exceed 20 kg.

104 (1) Articles of item 2 shall be packed in boxes made of sheet metal or fibreboard. Not more than 30 sheet metal boxes or 144 fibreboard boxes shall be included in a packet which must not contain more than 90 g of explosive. These packets shall be placed in a well-jointed packing case with sides at least 18 mm thick lined with stout paper or with thin zinc or aluminium sheet or with a sheet made of a plastics material not readily inflammable. A side thickness of 11 mm is sufficient for packages weighing not more than 35 kg when the cases are encircled by an iron band.

- (2) A package must not weigh more than 100 kg.
- 105 (1) Articles of item 3 shall be packed in wooden cases lined with stout paper or with thin zinc or aluminium sheet, or in drums made of waterproof fibreboard.
- Small consignments of a maximum weight of 20 kg, wrapped in corrugated fibreboard, may also be made up into packets wrapped in strong packing paper of two plies securely tied with string.
- (2) When in the form of a fibreboard drum, a package must not weigh more than 75 kg.
- 106 (1) Pyroxylin thread (item 4) shall be rolled in lengths not exceeding 30 m on fibreboard strips. Each reel shall be wrapped in paper. Not more than 10 of these reels shall be made up into packets in packing paper which shall be secured by cushioning material in small wooden cases. The cases shall be placed in a wooden packing case.
- (2) A package must not contain more than 6,000 m of pyroxylin thread.
- 107 (1) Articles of item 5 shall be packed, in quantities not exceeding 25 per box, in boxes made of tinplate or fibreboard; thermite caps, however, may be packed, not more than 100 at a time, in fibreboard boxes. Not more than 40 of these boxes shall be secured by cushioning material in a wooden case in such a manner that they cannot come into contact either with one another or with the sides of the case.
- (2) A package must not weigh more than 100 kg.
- 108 (1) Articles of items 6 to 8 shall be packed:
- (a) Those of item 6: in wooden cases;
- (b) Those of item 7 (a): in wooden cases or casks or in drums made of waterproof fibreboard;
- (c) Those of item 7 (b): in quantities not exceeding 1,000 per box, divided into at least three approximately equal groups by interposed fibreboard sheets and secured by sawdust cushioning in fibreboard boxes. The lids of the boxes shall be secured all round by gummed strips. Not more than 100 of these fibreboard boxes shall be placed in a perforated sheet iron receptacle. This receptacle shall be secured by cushioning material, in a wooden packing case closed by means of screws and whose sides shall be at least 18 mm thick, in such a manner that there is a space of at least 3 cm filled with cushioning material between the sheet iron receptacle and the packing case;
- (d) Those of item 8: in fibreboard boxes. The boxes shall be made up into a packet containing not more than 1,000 electric igniters. The packets shall be placed in a wooden packing case.
- (2) When in the form of a fibreboard drum, a package containing articles of item 7 (a) must not weigh more than 75 kg. A package containing articles of item 7 (b) must not weigh more than 50 kg; if it weighs more than 30 kg, it shall be fitted with means of handling.
- 109 (1) Articles of items 9 to 26 shall be packed (inner packaging):
- (a) Those of items 9 and 10: in paper packagings or in boxes;
- (b) Those of item 11 (a): secured by sawdust cushioning, not more than 500 at a time,
1. In fibreboard boxes which shall be wrapped in paper; or
  2. In small wooden cases;
- (c) Those of item 11 (b): in books, in quantities not exceeding 10 per book; these books shall be packed, in quantities not exceeding 100 per packet, in a fibreboard box or in strong paper;

- (d) Those of item 11 (c): in quantities not exceeding 10 per bag, in bags made of paper or a suitable plastics material, these bags being placed, in quantities not exceeding 100 per box, in a fibreboard box;
- (e) Those of item 12: in fibreboard boxes in quantities not exceeding 25 per box;
- (f) Those of item 13: in boxes. These boxes shall be wrapped in paper to form packets each containing not more than 12 boxes;
- (g) Those of item 14: in boxes or in bags made of paper or a suitable plastics material. These packagings shall be wrapped in paper to form packets each containing not more than 144 of these articles;
- (h) Those of item 15: in fibreboard boxes each of which must contain: not more than 100 caps each charged with not more than 5 mg of explosive; or not more than 50 caps each charged with not more than 7.5 mg of explosive.

Not more than 12 of these boxes shall be made up in paper into a roll, and not more than 12 of these rolls shall be wrapped in packing paper to form packets.

Strips of 50 caps each charged with not more than 5 mg of explosive may be packed in the following manner: in quantities not exceeding 5 strips per box, in fibreboard boxes which shall be wrapped 6 together in paper equivalent in strength to Kraft paper of a minimum weight of 40 g/m<sup>2</sup>; 12 small packets thus made up shall be wrapped together in paper of similar quality to form a large packet;

- (i) Those of item 16: secured by cushioning material, in fibreboard boxes in quantities not exceeding 50 per box. The corks shall be glued to the bottom of the boxes or fixed in position there by some similar method. Each box shall be wrapped in paper and not more than 10 of these boxes shall be wrapped in packing paper to form a packet;
- (k) Those of item 17: in fibreboard boxes in quantities not exceeding 5 per box. Not more than 200 boxes at a time, arranged in rolls, shall be placed together in an outer fibreboard box;
- (l) Those of item 18: secured by cushioning material, in fibreboard boxes in quantities not exceeding 10 per box. Not more than 100 boxes at a time, arranged in rolls, shall be wrapped in paper to form a packet;
- (m) Those of item 19: secured by cushioning material, in fibreboard boxes in quantities not exceeding 15 per box. Not more than 144 boxes at a time, arranged in rolls, shall be packed in a second fibreboard box;
- (n) Those of item 20 (a): secured by cushioning material in fibreboard cases, in quantities not exceeding 144 per case;
- (o) Those of item 20 (b): in fibreboard boxes in quantities not exceeding 75 per box; not more than 72 boxes at a time shall be wrapped in fibreboard to form a packet;
- (p) Those of item 21: in fibreboard boxes or in strong paper. If the ignition point of the articles has no protective cover, each article must first be wrapped separately in paper. The propellant charge of bombs weighing more than 5 kg shall be protected by a paper case covering the lower part of the bomb;
- (q) Those of item 22: in fibreboard boxes or in strong paper. However, large fireworks need not have an inner packaging if their ignition point has a protective cover;
- (r) Those of item 23: secured by cushioning material in boxes made of wood or fibreboard. The ignition heads shall have a protective cover;
- (s) Those of item 24: in fibreboard boxes or in strong paper;

- (t) Those of item 25: in fibreboard boxes or in strong paper. However, large fireworks need not have an inner packaging if their ignition point has a protective cover;
- (u) Those of item 26: in fibreboard boxes. A fibreboard box must not contain more than 3 glass tubes.
  - (2) The inner packagings mentioned in paragraph (1) shall be placed:
    - (a) Packagings containing articles of items 10, 13 or 14, in wooden packing cases;
    - (b) Packagings containing substances and articles of items 9, 11, 12 or 15 to 26, in well-jointed packing cases with sides at least 18 mm thick, lined with stout paper or thin zinc sheet or aluminium sheet. A side thickness of 11 mm is sufficient for packages weighing not more than 35 kg if the case is encircled by an iron band.

The contents of a packing case are to be limited:

- For articles of item 17, to 50 outer fibreboard boxes;
- For articles of item 18, to 25 packets;
- For articles of item 20 (a), to 50 fibreboard cases;
- For articles of item 20 (b), to 50 packets of 72 fibreboard boxes;
- For articles of item 21, to a total number of articles such that the total charge does not exceed 56 kg;
- (c) Packagings containing magnesium-flash powders (item 26), either in conformity with (b) above, or in wooden packing cases whose individual weight does not exceed 5 kg, or, in the case of packagings in the form of paper bags, in strong fibreboard cases each weighing not more than 5 kg.
  - (3) Wooden cases containing articles with an explosive charge having a phosphorus and chlorate base must be fastened by means of screws.
    - (4) A package containing articles of items 9, 11, 12, 15 to 22 or 24 to 26 must not weigh more than 100 kg; it must not weigh more than 50 kg if it contains articles of item 23, or more than 35 kg if the sides of the case are only 11 mm thick and the case is encircled by an iron band.

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(1) Substances and articles of item 27 shall be packed in wooden cases lined with packing paper, oiled-paper or corrugated fibreboard. No lining is necessary when these substances and articles are wrapped in paper or in fibreboard.

(2) A package must not weigh more than 100 kg.

(3) Smoke-producing cartridges for use as pesticides may, if wrapped in paper or fibreboard, likewise be packed:

- (a) In corrugated fibreboard boxes or in strong fibreboard cases; such a package must not weigh more than 20 kg;
- (b) In ordinary fibreboard cases; such a package must not weigh more than 5 kg.

### 3. *Mixed packing*

111

(1) Substances and articles listed under the same item may be included in the same package. The inner packagings shall conform to the requirements prescribed for each substance or article, and the outer packaging shall be that laid down for the substances or articles of the item in question. A fibreboard case containing articles of item 20 (a) shall be deemed equivalent to a packet containing articles of item 20 (b).

(2) If smaller quantities are not prescribed in the section "Packaging of individual substances and of articles of the same kind", and if special conditions are not set out below, substances and articles of this Class, in quantities not exceeding 6 kg for the total amount of substances and articles listed under a same

item or a same letter, may be placed together in the same package either with substances or articles of another item or another letter of the same Class or with substances or articles belonging to other Classes—as long as mixed packing is also permitted for these—or with other goods.

Inner packagings must comply with the general and special packaging conditions. In addition, the general regulations of marg. 4 (6) and 8 must be observed.

A package must not weigh more than 100 kg, or more than 50 kg if it contains articles of item 23.

*Special conditions:*

Item	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
1	Matches	5 kg	5kg	Must not be packed together with substances of Classes II, III a and III b.
2 and 3	Strips of amorces and slow-combustion fuses	Mixed packing not permitted		
4	Pyroxylin thread	1,500 m of pyroxylin thread		
5 to 8	All articles	Mixed packing not permitted		
9 to 20	All articles			Mixed packing only permitted with small wares and non-pyrotechnic toys from which they must be kept separate. The outer case must comply with the regulations relating to the articles contained therein in regard to which marg. 109 (2) and (3) impose the most stringent conditions.
9 to 25	All articles			Mixed packing only permitted with each other. The outer case must comply with the regulations relating to the articles contained therein in regard to which marg. 109 (2) and (3) impose the most stringent conditions.
26 and 27	All articles and substances	Mixed packing not permitted		

4. *Marking and danger labels on packages* (see Appendix IX).

- 112 Packages containing fragile receptacles not visible from the outside shall bear a label conforming to model No. 9.

B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

- 113 No restrictions in respect of *grande vitesse* and *petite vitesse*.

C. PARTICULARS IN THE CONSIGNMENT NOTE

- 114 (1) The description of the goods in the consignment note must conform to one of the names printed in *italics* in marg. 101; it must be *underlined in red* and followed by *particulars of the Class, the item number (together with the letter, if any), and the initials "RID"* [e.g. *I c, item 1 (a) RID*]. "*Fireworks of RID, I c, items . . .*" with particulars of the item under which the articles to be carried are listed, is also allowed in the consignment note.

(2) In the case of substances and articles of items 2, 4, 5, 8, 9, 11, 12 and 15 to 27, the sender must certify as follows in the consignment note "*The nature of the goods and the packaging are in conformity with the provisions of RID*".

D. TRANSPORT EQUIPMENT

1. *Conditions relating to wagons and their loading*

a. *For packages*

- 115 (1) Substances and articles of Class I c shall be loaded in covered wagons.  
(2) As regards the use of electrically-fitted wagons for the carriage of substances or articles of items 4, 21, 22, 23 and 26, see Appendix IV.

b. *For small containers*

- 116 (1) Packages containing substances or articles set out in this Class may be carried in small containers.  
(2) The prohibitions on mixed loading laid down in marg. 118 must be applied to the contents of a small container and in a wagon carrying one or more small containers.

2. *Marking and danger labels on wagons and on small containers* (see Appendix IX).

- 117 Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

E. PROHIBITIONS ON MIXED LOADING

- 118 (1) Substances and articles of Class I c must not be loaded in the same wagon together:

- (a) With substances of Class II, item 4 (marg. 201);  
(b) With substances of Class IV a, item 5 (marg. 401);  
(c) With substances of Class IV b (marg. 451).

(2) Substances and articles of items 1, 2, 4 to 6, 7 (b) and 8 to 27 must not be loaded in the same wagon together with substances and articles of Class I a (marg. 21).

(3) Articles of items 21, 22 and 23 must not be loaded in the same wagon together with substances of items 1 and 2, or with acetaldehyde, acetone and acetone mixtures of item 5 of Class III a (marg. 301).

- 119 Separate consignment notes must be made out for consignments which must not be loaded together in the same wagon [art. 6, para. 10 (d), of CIM].

- F. EMPTY PACKAGINGS  
 120 No regulations.
- G. OTHER REGULATIONS  
 121 No regulations.  
 122-129

CLASS I d. GASES: COMPRESSED, LIQUEFIED OR DISSOLVED UNDER PRESSURE

1. *List of substances*

- 130 (1) Among the substances and articles covered by the heading of Class I d, only those listed in marg. 131 are to be accepted for carriage, and then only subject to the conditions laid down in marg. 130 (3) to 168. These substances and articles to be accepted for carriage under certain conditions are to be considered as substances and articles of RID.

(2) The substances of Class I d have a critical temperature lower than 50° C or, at this temperature, a vapour pressure greater than 3 kg/cm<sup>2</sup>.

NOTE. Anhydrous hydrofluoric acid is included in Class I d although its vapour pressure at 50° C is only 2.7 to 2.8 kg/cm<sup>2</sup>.

(3) Substances of Class I d which polymerise easily, such as methyl vinyl ether, vinyl chloride, vinyl bromide, and ethylene oxide, are to be accepted for carriage only if the necessary steps have been taken to prevent their polymerisation during carriage.

To this end, special care should be taken to ensure that the receptacles do not contain substances liable to promote polymerisation.

- 131 A. COMPRESSED GASES [see also marg. 131 a, under (a)]:

Gases whose critical temperature is below -10° C are considered to be compressed gases for the purposes of RID.

1. (a) *Carbon monoxide, hydrogen containing not more than 2% oxygen, methane (fire damp and natural gas);*
- (b) *Water gas, synthesis gases (e.g. from the Fischer-Tropsch process), town gas (lighting gas, coal gas) and other mixtures of gases of item 1 (a), such as for example a mixture of carbon monoxide with hydrogen.*
2. *Compressed oil gas (rich gas).*
3. *Oxygen containing not more than 3% hydrogen, mixtures of oxygen with carbon dioxide containing not more than 20% carbon dioxide, nitrogen, compressed air, a mixture of 20% nitrogen with 80% oxygen\*, boron trifluoride, fluorine, helium, neon, argon, krypton, mixtures of rare gases, mixtures of rare gases with oxygen and mixtures of rare gases with nitrogen.*

For xenon, see under item 9.

For gases of item 3 in aerosol dispensers or non-refillable containers of gas under pressure, see under items 16 and 17.

- B. LIQUEFIED GASES [see also marg. 131 a, under (b). For gases of items 6 to 10 in aerosol dispensers and non-refillable containers of gas under pressure, see under items 16 and 17]:

\* Translator's note: The word *nitrox* used in the French text to describe this gaseous mixture has a different meaning in English.

Gases whose critical temperature is equal to or above  $-10^{\circ}\text{C}$  are considered to be liquefied gases for the purposes of RID.

(a) Liquefied gases having a critical temperature equal to or above  $70^{\circ}\text{C}$ :

4. *Liquefied oil gas* whose vapour pressure at  $70^{\circ}\text{C}$  does not exceed  $41\text{ kg/cm}^2$  (termed *Z gas*).
5. *Hydrogen bromide (anhydrous hydrobromic acid), hydrogen fluoride (anhydrous hydrofluoric acid), hydrogen sulphide (sulphuretted hydrogen), anhydrous ammonia, chlorine, sulphur dioxide (anhydrous sulphurous acid), nitrogen dioxide (nitrogen peroxide, dinitrogen tetroxide), T gas* (mixture of ethylene oxide with not more than 10% carbon dioxide by weight, whose vapour pressure at  $70^{\circ}\text{C}$  does not exceed  $29\text{ kg/cm}^2$ ).
6. *Propane, cyclopropane, propene (propylene), butane, isobutane, butadiene, butene (butylene) and isobutene (isobutylene)*.

NOTE. For liquefied gases, technical and impure, see under item 7.

7. Mixtures of hydrocarbons extracted from natural gas or by the distillation of derivatives of mineral oils, coal, etc., and mixtures of gases of item 6 which, as

*Mixture A*, have a vapour pressure at  $70^{\circ}\text{C}$  not exceeding  $11\text{ kg/cm}^2$  and a density at  $50^{\circ}\text{C}$  of not less than  $0.525\text{ [g/cm}^3\text{]}$ ,

*Mixture A 0*, have a vapour pressure at  $70^{\circ}\text{C}$  not exceeding  $16\text{ kg/cm}^2$  and a density at  $50^{\circ}\text{C}$  of not less than  $0.495\text{ [g/cm}^3\text{]}$ ,

*Mixture A 1*, have a vapour pressure at  $70^{\circ}\text{C}$  not exceeding  $21\text{ kg/cm}^2$  and a density at  $50^{\circ}\text{C}$  of not less than  $0.485\text{ [g/cm}^3\text{]}$ ,

*Mixture B*, have a vapour pressure at  $70^{\circ}\text{C}$  not exceeding  $26\text{ kg/cm}^2$  and a density at  $50^{\circ}\text{C}$  of not less than  $0.450\text{ [g/cm}^3\text{]}$ ,

*Mixture C*, have a vapour pressure at  $70^{\circ}\text{C}$  not exceeding  $31\text{ kg/cm}^2$  and a density at  $50^{\circ}\text{C}$  of not less than  $0.440\text{ [g/cm}^3\text{]}$ .

NOTE. In the case of the foregoing mixtures, the use of the following names customary in the trade is permitted for describing these substances:

Name given under item 7	Name in commercial use
Mixture A, mixture A 0 .....	<i>butane</i>
Mixture C .....	<i>propane</i>

8. (a) *Dimethyl ether, methyl vinyl ether, chloromethane (methyl chloride), bromomethane (methyl bromide), chloroethane (ethyl chloride), whether perfumed for spraying or not, phosgene (carbonyl chloride), cyanogen chloride, vinyl chloride, vinyl bromide, methylamine (monomethylamine), dimethylamine, trimethylamine, ethylamine (monoethylamine), ethylene oxide, methanethiol (methyl mercaptan)*;

NOTE. 1. A mixture of bromomethane with 1, 2-dibromoethane containing not more than 50% bromomethane (by weight) is not a liquefied gas for the purposes of RID and thus is not subject to the provisions of RID.

2. Mixtures of chloromethane or bromomethane with chloropicrin are substances of Class I d if the vapour pressure of the mixture at  $50^{\circ}\text{C}$  is higher than  $3\text{ kg/cm}^2$ .

- (b) *Dichlorodifluoromethane, dichlorofluoromethane (dichloromonofluoromethane), chlorodifluoromethane (monochlorodifluoromethane), dichlorotetrafluoroethane (CF<sub>2</sub>Cl-CF<sub>2</sub>Cl), chlorotrifluoroethane (CH<sub>2</sub>Cl-CF<sub>3</sub>) (monochlorotrifluoroethane), chlorodifluoroethane (CH<sub>3</sub>-CF<sub>2</sub>Cl) (mono-*



*chlorodifluoroethane*), *chlorotrifluoroethylene* (*monochlorotrifluoroethylene*), *bromochlorodifluoromethane* (*monochlorodifluoromonobromomethane*), 1,1-difluoroethane ( $\text{CH}_3\text{-CHF}_2$ ), *octafluorocyclobutane*:

NOTE. For describing the foregoing gases the use of the following names customary in the trade: Algofrene, Arcton, Edifren, Flugene, Forane, Freon, Frigen, Isceon, is permitted followed by the identification number specified in the table below:

Name given under item 8 (b)	Identification number
Dichlorodifluoromethane .....	12
Dichlorofluoromethane .....	21
Chlorodifluoromethane .....	22
Dichlorotetrafluoroethane ( $\text{CF}_2\text{Cl-CF}_2\text{Cl}$ )..	114
Chlorotrifluoroethane ( $\text{CH}_2\text{Cl-CF}_3$ ) .....	133a
Chlorodifluoroethane ( $\text{CH}_3\text{-CF}_2\text{Cl}$ ) .....	142b
Chlorotrifluoroethylene .....	1113
Bromochlorodifluoromethane .....	12B1
Difluoroethane ( $\text{CH}_3\text{-CHF}_2$ ) .....	152a
Octafluorocyclobutane .....	C318

(c) Mixtures of substances listed under item 8 (b) which, as

*Mixture F 1*, have a vapour pressure at 70° C not exceeding 13 kg/cm<sup>2</sup> and a density at 50° C not less than that of dichlorofluoromethane (1.30 g/cm<sup>3</sup>),

*Mixture F 2*, have a vapour pressure at 70° C not exceeding 19 kg/cm<sup>2</sup> and a density at 50° C not less than that of dichlorodifluoromethane (1.21 g/cm<sup>3</sup>),

*Mixture F 3*, have a vapour pressure at 70° C not exceeding 30 kg/cm<sup>2</sup> and a density at 50° C not less than that of chlorodifluoromethane (1.09 g/cm<sup>3</sup>).

NOTE. Trichlorofluoromethane (identification number 11), trichlorotrifluoroethane ( $\text{CFCl}_2\text{-CF}_2\text{Cl}$ ) (identification number 113) and chlorotrifluoroethane ( $\text{CHFCl-CHF}_2$ ) (identification number 133) are not liquefied gases for the purposes of RID, and thus are not subject to the provisions of RID. They may, however, enter into the composition of mixtures F1 to F3.

(b) Liquefied gases having a critical temperature equal to or above -10° C, but below 70° C:

9. *Xenon, carbon dioxide*, including mixtures of carbon dioxide with not more than 17% ethylene oxide by weight; *coal-firing tubes* containing carbon dioxide (such as charged *Cardox tubes*), *nitrous oxide* (*laughing gas*), *ethane, ethylene*.

For carbon dioxide, see also marg. 131 a, under (c).

NOTE. 1. Carbon dioxide and nitrous oxide are to be accepted for carriage only if they are at least 99% pure.

2. By coal-firing tube is meant a steel device with a very thick wall, fitted with a small bursting disc and containing carbon dioxide and a cartridge (generally called the heating element) which can be ignited only by means of an electric current; the composition in the heating element must be such that it cannot deflagrate when the device is not filled with carbon dioxide under pressure. Cardox or similar tubes handed

over for carriage must be of a type approved by a Government Department for use in mines.

10. *Hydrogen chloride, anhydrous, sulphur hexafluoride, chlorotrifluoromethane, bromotrifluoromethane (trifluoromonobromomethane), trifluoromethane, vinyl fluoride, 1,1-difluoroethylene (CH<sub>2</sub>=CF<sub>2</sub>).*

NOTE. 1. Sulphur hexafluoride is only to be accepted for carriage if it is at least 99% pure.

2. For describing the foregoing chlorofluorohydrocarbons the use of the following names customary in the trade: *Algofrene, Arcton, Edifren, Flugène, Forane, Fréon, Frigen, Iscéon*, is permitted, followed by the identification number specified in the table below:

Name given under item 10	Identification number
Chlorotrifluoromethane .....	13
Bromotrifluoromethane .....	13B1
Trifluoromethane .....	23
Vinyl fluoride .....	1141
Difluoroethylene .....	1132a

C. DEEPLY REFRIGERATED LIQUEFIED GASES:

11. *Liquid air, liquid oxygen and liquid nitrogen*, also when mixed with rare gases, *liquid mixtures of oxygen with nitrogen*, also when they contain rare gases, and *liquid rare gases*.
12. *Liquid methane, liquid ethane, liquid mixtures of methane with ethane*, also when they contain propane or butane, *liquid ethylene*.
13. *Liquid carbon dioxide*.

D. GASES DISSOLVED UNDER PRESSURE:

14. *Ammonia* dissolved in water
- (a) With more than 35% and not more than 40% ammonia,
- (b) With more than 40% and not more than 50% ammonia.

NOTE. Ammonia solution whose ammonia content does not exceed 35% is not subject to the provisions of RID.

15. *Acetylene* dissolved in a solvent (e.g. acetone) absorbed by porous materials.

E. AEROSOL DISPENSERS AND NON-REFILLABLE CONTAINERS OF GAS UNDER PRESSURE [see also marg. 131 a, under (d)]:

16. *Aerosol dispensers*
- (a) Containing not more than 45% inflammable substances by weight, but 250 g of these substances at the most;
- (b) Containing more than 45% inflammable substances by weight or more than 250 g of these substances, the percentage referring to the total contents (active substance plus propellant).

NOTE. Aerosol dispensers are receptacles which can be used only once, are equipped with a release valve or a dispersal device and contain under pressure, a gas or a mixture of gases listed in marg. 138 (2), or contain an active substance (insecticide, cosmetic, etc.) with such a gas or mixture of gases as a propellant.

17. *Non-refillable containers of gas under pressure*

(a) With inflammable contents,

## (b) With non-inflammable contents.

NOTE. Non-refillable containers of gas under pressure are receptacles which can be used only once, contain a gas or a mixture of gases listed in marg. 138 (2) (e.g. butane for camp cookers, refrigerant gases, etc.) but are not equipped with a release valve.

NOTE re items 16 and 17. By "inflammable substances" is meant:

—Gases (propellant in aerosol dispensers; contents of non-refillable containers of gas under pressure) mixtures of which with air can be ignited and have a lower and an upper explosion limit;

—Liquid substances (active substances in aerosol dispensers) of Class III a.

## F. EMPTY RECEPTACLES:

18. *Empty receptacles*, uncleaned, including receptacles of tank wagons and small tank containers, which have contained gases of items 1 and 2, boron trifluoride or fluorine of item 3, or gases of items 4 to 10 and 12 to 15.

NOTE. 1. Receptacles which, having been emptied of gases of items 1 and 2, boron trifluoride and fluorine of item 3 and gases of items 4 to 10 and 12 to 15, still contain small residual amounts, are regarded as empty.

2. Empty receptacles, uncleaned, which have contained gases of item 3 other than boron trifluoride and fluorine or gases of item 11, are not subject to the provisions of RID.

- 131a Gases and articles handed over for carriage in conformity with the following provisions are not subject to the regulations of Chapter 2 "Conditions of carriage":

- (a) Compressed gases which are neither inflammable nor toxic nor corrosive and whose pressure in the receptacle, referred to a temperature of 15° C, does not exceed 2 kg/cm<sup>2</sup>;
- (b) Liquefied gases contained, in quantities not exceeding 20 litres, in freezing appliances (refrigerators, ice machines, etc.) and necessary for their operation;
- (c) Liquefied carbon dioxide (item 9):
1. In seamless receptacles made of carbon steel or of aluminium alloys, having a capacity of not more than 200 cm<sup>3</sup> and containing not more than 0.75 g carbon dioxide per cm<sup>3</sup> of capacity;
  2. In metal capsules (sodors, sparklets), if the carbon dioxide in the gaseous state contains not more than 0.5% air and the capsules contain not more than 25 g carbon dioxide and not more than 0.75 g per cm<sup>3</sup> of capacity;
- (d) Articles of items 16 and 17 with a capacity not exceeding 50 cm<sup>3</sup>. A package of these articles must not weigh more than 10 kg.

2. *Conditions of carriage*

(The regulations relating to empty receptacles are to be found under F.)

## A. PACKAGES

1. *General conditions for packing*

- 132 (1) The materials of which the receptacles and their closures are made must not be liable to attack by the contents or form harmful or dangerous compounds therewith.\*

\* Care must be taken not to allow any moisture to enter the receptacles when they are being filled and to dry receptacles completely after hydraulic-pressure tests (see marg. 146) carried out with water or with aqueous solutions.

(2) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. When outer packagings are prescribed, the receptacles must be firmly secured therein. Unless otherwise specified in the section "Packing of individual substances", inner packagings may be enclosed in outer packagings, either singly or in groups.

(3) Metal receptacles intended for the carriage of gases of items 1 to 10, 14 and 15 must contain only the gas for which they have been tested and whose name is inscribed on the receptacle [see marg. 148 (1) (a)].

Derogations are allowed:

1. For metal receptacles tested for propane (item 6). These receptacles may also be filled with butane (item 6), but in such case the maximum filling allowed for butane must not be exceeded. The names of both gases, the prescribed test pressure for propane and the maximum filling weights allowed for propane and butane must be stamped on the receptacle;
2. For metal receptacles tested for mixtures of item 7:
  - (a) Receptacles tested for mixture A 0 may also be filled with mixture A. The names of the two gases, the prescribed test pressure for mixture A 0 and the maximum filling weights allowed for mixtures A and A 0 must be stamped on the receptacle;
  - (b) Receptacles tested for mixture A 1 may also be filled with mixtures A or A 0. The names of the three gases, the prescribed test pressure for mixture A 1 and the maximum filling weights allowed for mixtures A, A 0 and A 1 must be stamped on the receptacle;
  - (c) Receptacles tested for mixture B may also be filled with mixtures A, A 0 or A 1. The names of the four gases, the prescribed test pressure for mixture B and the maximum filling weights allowed for mixtures A, A 0, A 1 and B must be stamped on the receptacle;
  - (d) Receptacles tested for mixture C may also be filled with mixtures A, A 0, A 1 or B. The names of the five gases, the prescribed test pressure for mixture C and the maximum filling weights allowed for mixtures A, A 0, A 1, B and C must be stamped on the receptacle;

NOTE. For tank wagons, see marg. 159 (3).

3. For metal receptacles tested for dichlorofluoromethane [item 8 (b)]. These receptacles may also be filled with mixture F 1 [item 8 (c)]. The name of the gas must be stamped on the receptacle as follows: "dichlorofluoromethane" (or, alternatively, a recognized name customary in the trade) and "mixture F 1";
4. For metal receptacles tested for dichlorodifluoromethane [item 8 (b)]. These receptacles may also be filled with mixtures F 1 or F 2 [item 8 (c)]. The name of the gas must be stamped on the receptacle as follows: "dichlorodifluoromethane" (or, alternatively, a recognized name customary in the trade) and "mixtures F 1 or F 2", and also the maximum filling weight allowed for mixture F 2;
5. For metal receptacles tested for chlorodifluoromethane [item 8 (b)]. These receptacles may also be filled with mixtures F 1, F 2 or F 3 [item 8 (c)]. The name of the gas must be stamped on the receptacle as follows: "chlorodifluoromethane" (or, alternatively, a recognized name customary in the trade) and "mixtures F 1, F 2 or F 3", and also the maximum filling weight allowed for mixture F 3;

6. For metal receptacles tested for the mixtures of item 8 (c):
- (a) Receptacles tested for mixture F 2 may also be filled with mixture F 1. The maximum filling weight allowed must be equal to that prescribed for mixture F 2;
  - (b) Receptacles tested for mixture F 3 may also be filled with mixtures F 1 or F 2. The maximum filling weight allowed must be equal to that prescribed for mixture F 3.

NOTE. For tank wagons, see marg. 159 (3).

For 1. to 6., see also marg. 145, 148 (1) (a) and 150.

(4) A change in the use to which a receptacle is assigned is allowed in principle if it does not conflict with the national regulations; it requires, however, the approval of the competent authority and replacement of the former markings by markings relating to the new use.

## 2. *Packing of individual substances*

NOTE. Gases of items 12 and 13 may not be carried otherwise than in tank wagons or in large tank containers (see marg. 161).

### a. *Nature of receptacles*

- 133 (1) Receptacles intended for the carriage of gases of items 1 to 10, 14 and 15 shall be so closed and leakproof as to prevent any escape of the gases.
- (2) These receptacles shall be made of carbon steel or of steel alloy (special steels).

The following may, however, be used:

#### (a) Copper receptacles for:

1. Compressed gases (items 1 to 3), with the exception of boron trifluoride and fluorine (item 3), whose filling pressure at a temperature referred to 15° C does not exceed 20 kg/cm<sup>2</sup>;
2. The following liquefied gases: sulphur dioxide and T gas (item 5), gases of item 8 with the exception of phosgene, cyanogen chloride, methylamine, dimethylamine, trimethylamine, ethylamine and methanethiod;

#### (b) Aluminium-alloy receptacles [see Appendix II, under A; for tank wagons, see marg. 159 (2) (a) 1.] for:

1. Compressed gases (items 1 to 3), with the exception of boron trifluoride and fluorine (item 3);
2. The following liquefied gases: liquefied oil gas (item 4), hydrogen sulphide, sulphur dioxide and T gas (item 5), gases of items 6 and 7 free from alkaline impurities, dimethyl ether, ethylene oxide and methanethiol [item 8 (a)], gases of items 8 (b) and (c) and 9, sulphur hexafluoride and chlorotrifluoromethane (item 10). Sulphur dioxide, gases of item 8 (b) and (c) and chlorotrifluoromethane must be dry;
3. Dissolved acetylene (item 15).

- 134 (1) Receptacles for dissolved acetylene (item 15) shall be entirely filled with a porous material of a type approved by the competent authority, which, uniformly distributed,

- (a) Does not attack the receptacles and does not form harmful or dangerous compounds either with acetylene or with the solvent;
- (b) Does not shake down, even after prolonged use or under shock, at temperatures up to 60° C;

(c) Is capable of preventing the spread of decomposition of the acetylene in the mass.

(2) The solvent must not attack the receptacles.

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(1) The following liquefied gases may, in addition, be carried in thick-walled glass tubes on condition that the quantity of substance in each tube and the degree of filling of the tubes do not exceed the figures indicated below:

Names of gases	Quantity of substance	Degree of filling of tube
Carbon dioxide, nitrous oxide, ethane, ethylene (item 9) ...	3 g	1/2 of capacity
Ammonia, chlorine, nitrogen dioxide (item 5), cyclopropane (item 6), bromomethane, chloroethane [item 8 (a)] . . . . .	20 g	2/3 of capacity
Sulphur dioxide (item 5), phosgene [item 8 (a)] . . . . .	100 g	3/4 of capacity

(2) The glass tubes shall be flame-sealed and secured separately by infusorial earth cushioning in closed sheet-metal capsules which shall be placed in a wooden case (see also marg. 152).

(3) For sulphur dioxide (item 5) the following are also allowed:

(a) Small seamless aluminium-alloy bottles, which shall be filled to not more than three quarters of their capacity and shall not contain more than 100 g sulphur dioxide. The bottles shall be closed in a leakproof fashion and shall be placed in wooden cases, the bottles being kept apart;

(b) Stout glass siphons, containing not more than 1.5 kg of substance and filled to not more than 88% of their capacity. The siphons must be secured in position by infusorial earth, sawdust or powdered carbonate of lime, or by a mixture of the two latter, in strong wooden cases. A package must not weigh more than 100 kg. If it weighs more than 30 kg, it must be fitted with means of handling.

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(1) Provided that the weight of liquid per litre capacity does not exceed the maximum indicated in marg. 150 and the weight of liquid per tube does not exceed 150 g, T gas (item 5), and gases of items 6 to 8 other than phosgene and cyanogen chloride of item 8 (a) [as regards phosgene, see marg. 135 (1)] may also be contained in thick-walled glass tubes or in thick-walled metal tubes made of a metal allowed by marg. 133 (2). The tubes must be free from faults liable to impair their strength; in particular, internal stresses in glass tubes must have been suitably relieved, and the thickness of the tube walls may not be less than 2 mm. The tightness of the closure system must be ensured by an additional device (cap, crown, seal, binding, etc.) capable of preventing any loosening of the closure system during carriage. The tubes shall be secured by cushioning material in small boxes made of wood or fibreboard, the number of tubes per small box being such that the weight of the liquid contained in a box does not exceed 600 g. These small boxes shall be placed in wooden cases; if the liquid contents of a case weigh more than 5 kg, the case shall be lined with soft-soldered sheet metal.

(2) A package must not weigh more than 75 kg.

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(1) Gases of item 11 shall be enclosed:

(a) In double-walled vacuum-jacketed glass receptacles surrounded by absorbent insulating materials which, in the case of liquid-air and liquid-oxygen receptacles shall also be incombustible. The glass receptacles shall be protected by iron-wire baskets and placed in cases made of metal or wood, which shall be fitted with means of handling;

(b) In receptacles made of another material, on condition that they are protected against heat transmission in such a way that they cannot become coated with

dew or hoar-frost. These receptacles need not be placed in a packaging. The receptacles shall be fitted with means of handling.

(2) Receptacles shall be closed by stoppers allowing gases to escape, preventing any splashing out of the liquid and so fixed that they cannot fall out. In the case of oxygen and mixtures containing oxygen, the stoppers shall be made of an incombustible material.

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(1) Aerosol dispensers (item 16) and non-refillable containers of gas under pressure (item 17) must satisfy the following requirements:

- (a) Aerosol dispensers containing only a gas or a mixture of gases and non-refillable containers for gas under pressure must be made of metal. Other aerosol dispensers must be made of metal, a plastics material or glass. Receptacles made of metal and having an outside diameter of not less than 40 mm must have a concave bottom;
- (b) Receptacles made of materials liable to shatter, such as glass and certain plastics materials, must be enclosed in a device (close-mesh wire netting, flexible cover made of a plastics material, etc.) affording protection against fragments and their dispersal. Receptacles with a capacity not exceeding 150 cm<sup>3</sup> and whose internal pressure at 20° C is below 1.5 kg/cm<sup>2</sup> are exempted from this requirement;
- (c) The capacity of receptacles made of metal must not exceed 1,000 cm<sup>3</sup>; that of receptacles made of a plastics material or of glass must not exceed 220 cm<sup>3</sup>;
- (d) Each model of receptacle must, before being put into service, satisfy a hydraulic pressure test carried out in conformity with Appendix II, marg. 1291. The internal pressure to be applied (test pressure) must be 1.5 times the internal pressure at 50° C, with a minimum of 10 kg/cm<sup>2</sup>;
- (e) The release valves of aerosol dispensers, and their dispersal devices, must ensure that the dispensers are so closed as to be leakproof and must be protected against accidental opening. Valves and dispersal devices which close only by the action of the internal pressure are not to be accepted.

(2) The following gases are to be accepted as propellants, or as constituents of propellants, or as filler gases, for aerosol dispensers and as the contents of non-refillable containers for gas under pressure:

Oxygen, mixtures of oxygen with carbon dioxide, nitrogen, compressed air, a mixture of 20% nitrogen with 80% oxygen (item 3); propane, cyclopropane, propene, butane, isobutane, butadiene, butene, isobutene (item 6); the mixtures A, A0, A1, B, C (item 7); dimethyl ether, chloroethane, vinyl chloride [item 8 (a)]; dichlorodifluoromethane, dichlorofluoromethane, chlorodifluoromethane, dichlorotetrafluoroethane, chlorotrifluoroethane, chlorodifluoroethane, chlorotrifluoroethylene, bromochlorodifluoromethane, 1,1-difluoroethane, octafluorocyclobutane [item 8 (b)]; the mixtures F 1, F 2, F 3 [item 8 (c)]; carbon dioxide, nitrous oxide, ethane, ethylene (item 9); sulphur hexafluoride, chlorotrifluoromethane, bromotrifluoromethane, trifluoromethane, vinyl fluoride and 1,1-difluoroethylene (item 10).

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(1) The internal pressure at 50° C of aerosol dispensers and of non-refillable containers of gases under pressure must exceed neither two thirds of the test pressure of the receptacle nor 12 kg/cm<sup>2</sup>.

(2) Aerosol dispensers and non-refillable containers of gas under pressure must be so filled that at 50° C the liquid phase does not exceed 95% of their capacity. The capacity of aerosol dispensers is the available volume in a closed dispenser fitted with the valve support, the valve and the dip tube.

(3) All aerosol dispensers and non-refillable containers for gas under pressure must satisfy a tightness (leakage) test in conformity with Appendix II, marg. 1292.

140 (1) Aerosol dispensers and non-refillable containers of gas under pressure must be placed in wooden cases or strong fibreboard or metal boxes; aerosol dispensers made of glass or a plastics material and liable to shatter shall be separated from one another by interposed sheets of fibreboard or of another suitable material.

(2) A package must not weigh more than 30 kg.

b. *Conditions relating to metal receptacles*

[These conditions are applicable neither to the aluminium-alloy bottles referred to in marg. 135 (3), nor to the metal tubes mentioned in marg. 136, nor to the receptacles mentioned in marg. 137 (1) (b), nor to the aerosol dispensers and non-refillable metal containers for gas under pressure referred to in marg. 138; for the receptacles of tank wagons, see also marg. 159 to 162; for small tank containers, see also marg. 163 (3)].

1. *Construction and fittings* [see also marg. 168 (2)].

141 (1) At the test pressure, the stress in the metal at the most severely stressed point of the receptacle (marg. 145, 149 and 150) must not exceed three quarters of the yield stress. By "yield stress" is meant the stress at which a permanent elongation of 2‰ (i.e. 0.2%) of the gauge length on the test-piece has been produced.

(2) (a) Steel receptacles whose test pressure exceeds 60 kg/cm<sup>2</sup> must be of seamless construction or welded. For welded receptacles, steels (carbon or alloy) of fully satisfactory weldability must be used. Welded receptacles are to be accepted only on condition that the manufacturer guarantees the workmanship of the welding and that the competent authorities of the country of origin have given their approval.

(b) Receptacles whose test pressure does not exceed 60 kg/cm<sup>2</sup> must either conform to the provisions of (a) above or be riveted or hard-soldered [For tank wagons, see marg. 159 (2) (a) 2.] on condition that the manufacturer guarantees the workmanship of the riveting and hard-soldering and that the competent authorities of the country of origin have given their approval.

(3) Aluminium-alloy receptacles must be seamless.

142 (1) A distinction is made between the following types of receptacles:

(a) Cylinders with a capacity not exceeding 150 litres;

(b) Receptacles with a capacity of not less than 100 litres [with the exception of cylinders in conformity with (a)] and not more than 1,000 litres (e.g. cylindrical receptacles equipped with rolling hoops, and receptacles on skids);

(c) Large receptacles with a capacity of more than 1,000 litres;

NOTE. 1. For small tank containers, see also marg. 163 (3);

2. For tank wagons and receptacles of any other kind fixed to their underframe and large tank containers, see also marg. 159 to 162.

(d) Assemblies, known as "frames" (or "baskets"), of cylinders in conformity with (1) (a), interconnected by a manifold and held firmly together by a metal fitting.

NOTE. For battery wagons, see marg. 160 (3) (b) 2.

(2) (a) If, under the regulations of the country of departure, cylinders in conformity with (1) (a) are required to be fitted with a device to prevent rolling, this device must not be integral with the valve cap [marg. 143 (2)].



(b) Receptacles in conformity with (1) (b) which are capable of being rolled must be equipped with rolling hoops.

Other receptacles in conformity with (1) (b) must be fitted with a device (skids, rings, straps) which ensures that they can be safely handled by mechanical means and which is so arranged as not to impair the strength of and not to cause undue stresses in the wall of the receptacle.

(c) Frames of cylinders in conformity with (1) (d) must be fitted with devices ensuring that they can be handled safely. The manifold and the master cock must be situated within the frame and be so fixed as to be protected against any damage.

(3) (a) With the exception of gases of items 11 to 13, gases of Class I d may be carried in cylinders in conformity with (1) (a).

NOTE. For fluorine (item 3), see also marg. 149 (3).

(b) With the exception of fluorine (item 3) and gases of items 11 to 13, gases of Class I d may be carried in receptacles in conformity with (1) (b).

If dissolved acetylene (item 15) is carried in receptacles in conformity with (1) (b), the capacity of the receptacles must not exceed 500 litres and these receptacles must not be capable of rolling on their own.

(c) For large receptacles in conformity with (1) (c), see marg. 159 (1), 160 (1), (2) and (3), 161 (1) and 163 (3).

(d) With the exception of gases of items 11 to 13, gases of Class I d may be carried in frames (or baskets) of cylinders in conformity with (1) (d), but the cylinders in one frame must all contain the same compressed gas, liquefied gas or gas dissolved under pressure.

The cylinders in a frame must not be capable of being isolated by means of cocks. However, in frames of cylinders for fluorine (item 3) and acetylene (item 15) each receptacle must be capable of being isolated by a cock.

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(1) Openings for filling and emptying receptacles shall be fitted with clap valves or needle valves. Valves of other types may, however, be allowed if they present equivalent guarantees of safety and have been approved in the country of origin. Nevertheless, whatever the type of valve adopted, its system of attachment must be strong and such that its satisfactory condition can be verified easily before each filling.

Receptacles and tanks in conformity with marg. 142 (1) (b) and (c) must not have more than two openings, for filling and emptying respectively, in addition to the manhole (if one is provided), which must be closed by an efficient closure, and to the necessary orifice for the removal of deposits. Nevertheless, receptacles with a capacity of not less than 100 litres intended for the carriage of dissolved acetylene (item 15) may have more than two openings for filling and emptying.

Similarly, receptacles and tanks in conformity with marg. 142 (1) (b) and (c) and intended for the carriage of substances of items 6 and 7 may be provided with other openings intended in particular for verifying the level of the liquid and the gauge pressure.

(2) Valves shall be protected by steel caps having vents. Receptacles made of copper or of aluminium alloy may also be provided with caps made of the material of which the receptacle is made. Valves placed inside the neck of the receptacles and protected by a screw-threaded metal stopper, and receptacles which are carried packed in protective cases, shall not require a cap.

(3) The steel caps of receptacles containing fluorine (item 3) cyanogen chloride [item 8 (a)] must have no openings and shall, throughout carriage, be

fitted with a gasket ensuring gas-tightness and made of a material not liable to attack by the contents of the receptacle.

144 (1) In the case of receptacles containing boron trifluoride or fluorine (item 3), liquefied ammonia or ammonia dissolved in water (items 5 and 14), methylamines or ethylamine [item 8 (a)], valves made of copper or any other metal liable to be attacked by these gases are not to be accepted.

(2) The use of materials containing grease or oil for ensuring the tightness of joints or for maintaining the closure devices of receptacles used for oxygen, mixtures of oxygen with carbon dioxide containing not more than 20% carbon dioxide, compressed air, the mixture of 20% nitrogen and 80% oxygen, fluorine, mixtures of rare gases with oxygen (item 3), nitrogen dioxide (item 5) and nitrous oxide (item 9) is prohibited.

(3) Receptacles for dissolved acetylene (item 15) may also have stop valves taking yoke connectors. Metal parts of closure devices in contact with the contents must not contain more than 70% copper.

(4) Receptacles containing compressed oxygen (item 3) and fitted in fish-tanks are likewise to be accepted if they are provided with an apparatus enabling the oxygen to escape gradually.

2. *Official test of receptacles* (see also Appendix II, under A).

145 (1) Metal receptacles must be subjected to initial and periodic tests under the supervision of an expert approved by the competent authority. The nature of these tests is specified in marg. 146 and 147.

(2) In order to ensure that the requirements of marg. 134 and 151 (2) are complied with, tests of receptacles intended to contain dissolved acetylene (item 15) shall comprise, in addition, an examination of the nature of the porous material and the quantity of the solvent.

146 (1) The *initial test* of new or unused receptacles comprises:

A. On an adequate sample of receptacles:

- (a) The test of the material of construction must include at least determination of the yield stress, the tensile strength, and the permanent elongation at fracture; the values yielded by these tests must comply with national regulations;
- (b) Measurement of thickness at the thinnest point of the wall and calculation of the stress;
- (c) Checking the homogeneity of the material for each manufacturing batch, and inspecting the external and internal condition of the receptacles;

B. For all receptacles:

- (d) A hydraulic-pressure test in conformity with the provisions of marg. 149 to 151;
- (e) An inspection of the markings on the receptacles (see marg. 148);

C. In addition, for receptacles intended for the carriage of dissolved acetylene (item 15):

(f) Inspection as required by national regulations.

(2) Receptacles must withstand the test pressure without undergoing any permanent deformation or exhibiting cracks.

(3) At the *periodic inspections* the following shall be repeated:

The hydraulic-pressure test, inspection of the external and internal condition of the receptacle (e.g. by weighing, internal inspection, checks of wall thickness),

verification of the equipment and markings and, if necessary, verification of the characteristics of the material following suitable tests.

Periodic inspections shall be carried out:

- (a) Every 2 years in the case of receptacles intended for the carriage of town gas [item 1 (b)], boron trifluoride, fluorine (item 3), hydrogen bromide, hydrogen fluoride, hydrogen sulphide, chlorine, sulphur dioxide, nitrogen dioxide (item 5), phosgene, cyanogen chloride [item 8 (a)] and hydrogen chloride, anhydrous (item 10) [see also marg. 159 (2) (a) 10.];
- (b) Every 5 years in the case of receptacles intended for the carriage of the other compressed and liquefied gases, subject to the provisions of (c) below, and in the case of receptacles for the carriage of ammonia dissolved under pressure (item 14);
- (c) Every 10 years in the case of receptacles intended for the carriage of gases of items 6 and 7 if the receptacles have a capacity of not more than 150 litres and the country of origin does not prescribe a shorter interval.

147 The external condition (corrosion, deformation) of, and the condition of the porous material (loosening, settlement) in, receptacles intended for the carriage of dissolved acetylene (item 15) shall be examined every ten years. Sampling shall be performed by cutting up, if considered necessary, a suitable number of receptacles and inspecting them internally for corrosion and for any changes that may have occurred in the constituent materials and the porous material.

3. *Marks on receptacles* (for the receptacles of tank wagons, see marg. 162)

148 (1) Metal receptacles shall bear the following particulars in clearly legible and durable characters:

- (a) The name of the gas in full, the name or mark of the maker or owner and the number of the receptacle [see also marg. 132 (3)];
- (b) The tare of the receptacle, including such fittings and accessories as valves, metal closures, etc., but excluding the protective cap;
- (c) The test pressure (see marg. 149 to 151) and the date (month, year) of the last test (see marg. 146 and 147);
- (d) The stamp of the expert who carried out the tests and inspections; in addition:
- (e) In the case of compressed gases (items 1 to 3): the maximum filling pressure allowed for the receptacle in question (see marg. 149);
- (f) In the case of liquefied gases (items 4 to 10) and ammonia dissolved in water (item 14): the maximum load allowed and the capacity;
- (g) In the case of acetylene dissolved in a solvent (item 15): the permitted pressure [see marg. 151 (2)], and the weight of the empty receptacle including the weight of the fittings and accessories, the porous material and the solvent.

(2) The marks shall be engraved either on a reinforced part of the receptacle or on a ring immovably fixed to the receptacle. In addition the name of the substance may be indicated on the receptacle by an inscription in adherent and clearly visible paint.

(3) Cased receptacles shall be packed in such a manner that the test stamps can be readily found.

*c. Test pressure and degree of filling of receptacles* [see also marg. 168 (2)]

149 (1) In the case of receptacles intended for the carriage of compressed gases of items 1 to 3, with the exception of fluorine, the internal pressure (test pressure) to be applied for the hydraulic-pressure test must be at least one and a half times the filling pressure at 15° C indicated on the receptacle, but must not be less than 10 kg/cm<sup>2</sup>.

(2) In the case of receptacles intended for the carriage of hydrogen of item 1 (a), oxygen, mixtures of oxygen with carbon dioxide, nitrogen, compressed air, the mixture of 20% nitrogen and 80% oxygen, helium, neon, argon, krypton, mixtures of rare gases, mixtures of rare gases with oxygen, and mixtures of rare gases with nitrogen of item 3, the filling pressure must not exceed 250 kg/cm<sup>2</sup> referred to a temperature of 15° C.

In the case of receptacles intended for the carriage of other gases of items 1 to 3, with the exception of fluorine of item 3 [see under (3)], the filling pressure must not exceed 200 kg/cm<sup>2</sup> referred to a temperature of 15° C.

(3) In the case of receptacles intended for the carriage of fluorine (item 3), the internal pressure (test pressure) to be applied for the hydraulic-pressure test must be equal to 200 kg/cm<sup>2</sup> and the filling pressure must not exceed 28 kg/cm<sup>2</sup> at a temperature of 15° C; in addition, no receptacle may contain more than 5 kg fluorine.

(4) The sender of compressed gases, other than oil gas (item 2) contained in buoys or similar receptacles, may be required to verify the pressure in the receptacle by means of a pressure gauge.

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(1) In the case of receptacles intended for the carriage of liquefied gases of items 4 to 10, and in the case of those intended for the carriage of gases dissolved under pressure of items 14 and 15, the hydraulic pressure to be applied for the test (test pressure) must be not less than 10 kg/cm<sup>2</sup>.

(2) In the case of liquefied gases of items 4 to 8, the following values must be complied with for the hydraulic pressure to be applied to the receptacles for test (test pressure), and for the maximum degree of filling allowed\*:

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\* 1. The test pressures prescribed are at least equal to the vapour pressures of the liquids at 70° C, reduced by 1 kg/cm<sup>2</sup>, the minimum test pressure required, however, being 10 kg/cm<sup>2</sup>.

2. In view of the high degree of toxicity of phosgene and cyanogen chloride [item 8 (a)], the minimum test pressure for these gases has been fixed at 20 kg/cm<sup>2</sup>. By reason of the use of the receptacles for mixtures F 1, the minimum test pressure for dichlorofluoromethane [item 8 (b)] has been fixed at 12 kg/cm<sup>2</sup>.

3. The maximum values prescribed for the degree of filling in kg/litre have been determined as follows: maximum degree of filling allowed = 0.95 times the density of the liquid phase at 50° C; in addition, the vapour phase must not disappear below 60° C.

	Item	Minimum test pressure kg/cm <sup>2</sup>	Max. weight of liquid per litre capacity kg
Liquefied oil gas .....	4	40	0.37
Hydrogen bromide .....	5	60	1.20
Hydrogen fluoride .....	5	10	0.84
Hydrogen sulphide .....	5	53	0.67
Ammonia .....	5	33	0.53
Chlorine .....	5	22	1.25
Sulphur dioxide .....	5	14	1.23
Nitrogen dioxide .....	5	10	1.30
T gas .....	5	28	0.73
Propane .....	6	26	0.42
Cyclopropane .....	6	25	0.53
Propene .....	6	30	0.43
Butane .....	6	10	0.51
Isobutane .....	6	10	0.49
Butadiene .....	6	10	0.55
Butene .....	6	10	0.52
Isobutene .....	6	10	0.52
Mixture A .....	7	10	0.50
Mixture A 0 .....	7	15	0.47
Mixture A I .....	7	20	0.46
Mixture B .....	7	25	0.43
Mixture C .....	7	30	0.42
Dimethyl ether .....	8 (a)	18	0.58
Methyl vinyl ether .....	8 (a)	10	0.67
Chloromethane .....	8 (a)	17	0.81
Bromomethane .....	8 (a)	10	1.51
Chloroethane .....	8 (a)	10	0.80
Phosgene .....	8 (a)	20	1.23
Cyanogen chloride .....	8 (a)	20	1.03
Vinyl chloride .....	8 (a)	11	0.81
Vinyl bromide .....	8 (a)	10	1.37
Methylamine .....	8 (a)	13	0.58
Dimethylamine .....	8 (a)	10	0.59
Trimethylamine .....	8 (a)	10	0.56
Ethylamine .....	8 (a)	10	0.61
Ethylene oxide .....	8 (a)	10	0.78
Methanethiol .....	8 (a)	10	0.78
Dichlorodifluoromethane .....	8 (b)	18	1.15
Dichlorofluoromethane .....	8 (b)	12	1.23
Chlorodifluoromethane .....	8 (b)	29	1.03
Dichlorotetrafluoroethane .....	8 (b)	10	1.30
Chlorotrifluoroethane .....	8 (b)	10	1.20
Chlorodifluoroethane .....	8 (b)	10	0.99
Chlorotrifluoroethylene .....	8 (b)	19	1.13
Bromochlorodifluoromethane .....	8 (b)	10	1.61
1,1-difluoroethane .....	8 (b)	18	0.79
Octafluorocyclobutane .....	8 (b)	11	1.34
Mixture F 1 .....	8 (c)	12	1.23
Mixture F 2 .....	8 (c)	18	1.15
Mixture F 3 .....	8 (c)	29	1.03

(3) In the case of receptacles intended to contain liquefied gases of items 9 and 10, the degree of filling shall be such that the internal pressure at 65° C does not exceed the test pressure of the receptacles. The following values must be complied with [see also under (4) and (5)].

	Item	Minimum test pressure kg/cm <sup>2</sup>	Max. weight of liquid per litre capacity kg
Xenon .....	9	130	1.24
Carbon dioxide, alone or mixed with ethylene oxide .....	9	250	0.75
Nitrous oxide .....	9	250	0.75
Ethane .....	9	120	0.29
Ethylene .....	9	225	0.34
Hydrogen chloride, anhydrous .....	10	200	0.74
Sulphur hexafluoride .....	10	70	1.04
Chlorotrifluoromethane .....	10	100	0.83
Bromotrifluoromethane .....	10	120	1.44
Trifluoromethane .....	10	250	0.95
Vinyl fluoride .....	10	250	0.64
1,1-difluoroethylene .....	10	250	0.77

(4) For substances of items 9 and 10, the use of receptacles tested at a lower pressure than that indicated in (3) for the substance in question is allowed, but the quantity of substance per receptacle must not exceed that which would, at 65° C, produce inside the receptacle a pressure equal to the test pressure.

(5) The degree of filling with carbon dioxide of coal-firing tubes (item 9) shall comply with the rules laid down for the approval of the tubes by the government department which has approved them.

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(1) In the case of gases dissolved under pressure of items 14 and 15, the following values must be complied with for the hydraulic pressure to be applied to the receptacles for the test (test pressure), and for the maximum degree of filling allowed:

	Item	Minimum test pressure kg/cm <sup>2</sup>	Max. weight of liquid per litre capacity kg
Ammonia dissolved under pressure in water			
With more than 35% and not more than 40% ammonia .....	14 (a)	10	0.80
With more than 40% and not more than 50% ammonia .....	14 (b)	12	0.77
Dissolved acetylene .....	15	60	see under (2)

(2) In the case of dissolved acetylene (item 15), the filling pressure must not exceed 15 kg/cm<sup>2</sup> once equilibrium has been achieved at 15° C. The quantity of solvent, referred to a temperature of 15° C, must be such that the increase in volume which it undergoes when absorbing acetylene at the filling pressure leaves in the porous mass a free volume equal to not less than 12% of the water capacity of the receptacle.

3. *Mixed packing*

152

(1) Among the receptacles containing substances of this Class, only those containing the substances listed below may be included in the same package with one another:

- (a) Ammonia, chlorine, sulphur dioxide, nitrogen dioxide (item 5), cyclopropane (item 6), bromomethane, chloroethane, phosgene [item 8 (a)], carbon dioxide, nitrous oxide, ethane and ethylene (item 9); however, chlorine must not be packed together with ammonia or sulphur dioxide (item 5). Gases must be packed in conformity with marg. 135;
- (b) Gases of item 8 (except phosgene and cyanogen chloride) packed in conformity with marg. 136.

(2) If smaller quantities are not prescribed in the section "Packing of individual substances" and if special conditions are not set out below, substances of this Class, in quantities not exceeding 6 kg for all of the substances listed under the same item or the same letter, may be placed together in the same package either with substances or articles of another item or another letter of the same Class, or with substances or articles belonging to other Classes—as long as mixed packing is also permitted for these—or with other goods.

Inner packagings must comply with the general and the special conditions for packing. In addition, the general regulations of marg. 4 (6) and 8 must be observed.

A package must not weigh more than 150 kg, or more than 75 kg if it contains fragile receptacles.

*Special conditions:*

Item	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
1 to 3	Compressed gases	Mixed packing not permitted		
5	Ammonia, in thick-walled glass tubes, flame-sealed	20 g		
	Chlorine	Mixed packing not permitted		
	Sulphur dioxide —in thick-walled glass tubes, flame-sealed —in glass siphons	100 g 1.5 kg	1.5 kg	A package may contain up to 4 siphons if they are separated by wood partitions as thick as the sides of the case.
	—in seamless aluminium-alloy bottles	100 g		
	Nitrogen dioxide —in thick-walled glass tubes, flame-sealed —in metal receptacles	20 g	Mixed packing not permitted	

Item	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
	T gas, in glass or metal tubes, both thick-walled	150 g	5 g	
6 to 8	All gases [except phosgene and cyanogen chloride (item 8 (a))], in glass or metal tubes both thick-walled [see marg. 136 (1)]			
6	Cyclopropane, in thick-walled glass tubes, flame-sealed	20 g		
8 (a)	Bromomethane, chloroethane, both in thick-walled glass tubes, flame-sealed			
	Phosgene, in thick-walled glass tubes, flame-sealed			
	Cyanogen chloride	Mixed packing not permitted		
9	Carbon dioxide, nitrous oxide, ethane, ethylene, all in thick-walled glass tubes, flame-sealed	3 g		
11, 14 and 15	Deeply refrigerated liquefied gases, gases dissolved under pressure	Mixed packing not permitted		
16 and 17	Aerosol dispensers and non-refillable containers of gas under pressure	Mixed packing only permitted with ordinary goods		

4. *Marking and danger labels on packages (see Appendix IX).*

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(1) Every package containing receptacles holding gases of items 1 to 11, 14, 15, or non-refillable containers of gas under pressure of item 17 shall be marked legibly and indelibly with an indication of its contents, with the addition: "Class I d". This marking shall be in an official language of the country of origin and also in French, German or Italian, unless the international tariffs or agreements concluded between the railway administrations provide otherwise.

(2) Packages containing aerosol dispensers of item 16 shall be marked with the word "AEROSOL" in clearly legible and indelible characters.



(3) In the case of full wagon loads, the markings referred to in (1) are not mandatory if the wagon itself bears these particulars on both sides.

154 (1) Packages which contain glass tubes holding liquefied gases listed in marg. 135 to 136 shall bear a label conforming to model No. 9.

(2) Every package containing gases of item 11 shall bear, on two opposite sides, labels conforming to model No. 8, and if the substances it contains are enclosed in glass receptacles [marg. 137 (1) (a)], it shall bear in addition a label conforming to model No. 9.

(3) Every package containing aerosol dispensers of item 16 (b) or non-refillable containers of gas under pressure of item 17 (a) shall bear a label conforming to model No. 2.

Packages containing aerosol dispensers (item 16) made of materials liable to shatter shall, in addition, bear a label conforming to model No. 9.

#### B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

155 (1) Substances of item 1 (a)—except carbon monoxide, —items 2, 3—except boron trifluoride—and item 4, anhydrous ammonia (item 5), substances of items 6, 7, 8 (a)—except bromomethane, phosgene, cyanogen chloride, ethylamine and ethylene oxide—, items 8 (b), 8 (c), 9, 10—except hydrogen chloride, anhydrous—, items 11, 14 and 15 and articles of items 16 and 17 may also be sent as express parcels; in this case, a package must not weigh more than 40 kg, or more than 30 kg, if it contains articles of items 16 and 17.

(2) Gases of items 12 and 13 may not be carried otherwise than in tank wagons. The sender and the railway must agree on the conditions of carriage before consignments are handed over for carriage; similar agreement is also necessary with respect to the carriage of gases of item 11 in tank wagons fitted with safety valves.

#### C. PARTICULARS IN THE CONSIGNMENT NOTE

156 (1) The description of the goods in the consignment note must conform to one of the names printed in *italics* in marg. 131; it must be *underlined in red* and followed by *particulars of the Class, the item number (together with the letter, if any), and the initials "RID"* [e.g. *I d, item I (a), RID*].

(2) In the case of consignments of coal-firing tubes (item 9), the sender shall include after the description of the goods in the consignment note the words: "*Tube approved on . . . (date) by . . . (name of government department) of . . . (name of country)*".

(3) In the case of consignments of gases liable to self-polymerisation such as methyl vinyl ether, vinyl chloride, vinyl bromide and ethylene oxide [item 8 (a)], the sender must certify as follows in the consignment note: "*The necessary steps have been taken to prevent polymerisation during carriage*".

(4) In the case of consignments of articles of items 16 and 17, the sender must certify as follows in the consignment note: "*The nature of the goods, the packing and the packaging are in conformity with the provisions of RID*".

(5) In the case of tank wagons containing gases of item 11, the sender shall include, in the consignment note one of the following entries as appropriate:

—"*The tank is in permanent communication with the atmosphere*";

—"*The tank is closed by valves guaranteed to be incapable of opening before . . . (date agreed to by the railway)*".

(6) In the case of tank wagons containing gases of items 12 and 13, the sender shall include in the consignment note the following entry:

—"*The tank is closed by valves guaranteed to be incapable of opening before . . . (date agreed to by the railway)*".

## D. TRANSPORT EQUIPMENT

1. *Conditions relating to wagons and their loading*a. *For packages*

157 Packages containing gases:

(a) Of items 1 to 10 and 15 shall be loaded in covered wagons, or in open wagons which, from April to October inclusive, must be protected by sheets unless the receptacles are packed in wooden cases;

(b) Of items 11, 16 and 17 shall be loaded in covered wagons.

158 (1) Packages must not be thrown or subjected to impact, nor must they be exposed to the sun's rays or to other sources of heat.

(2) Receptacles shall be so stowed in wagons that they cannot overturn or fall and that the following requirements are met:

(a) The cylinders referred to in marg. 142 (1) (a) shall be laid parallel or at right angles to the longitudinal axis of the wagon; however, cylinders which are near the end walls shall be laid at right angles to the said axis;

Short cylinders of large diameter (about 30 cm and over) may be placed longitudinally, the closures pointing towards the middle of the wagon.

Sufficiently stable cylinders may be placed upright.

Cylinders which are laid flat shall be prevented from moving sideways by wedges or crosspieces;

(b) Receptacles containing gases of item 11 shall always be placed with the opening uppermost and protected against any damage which might be caused by other packages;

(c) Receptacles fitted for rolling shall be laid with their longitudinal axis parallel to that of the wagon and shall be secured against any lateral movement.

b. *For tank wagons and receptacles of any other kind fixed on their under-frame*

159 (1) With the exception of fluorine (item 3), cyanogen chloride [item 8 (a)], and dissolved acetylene (item 15), gases of Class I d may be carried in tank wagons.

(2) The conditions relating to receptacles forwarded as packages are also applicable to receptacles of tank wagons for gases of items 1 to 10 and 14, with the following exceptions and special requirements:

(a) 1. By derogation from marg. 133 (2) (b), the receptacles of tank wagons must not be made of alloys of aluminium.

2. By derogation from marg. 141 (2), receptacles whose test pressure does not exceed 60 kg/cm<sup>2</sup> may only be seamless or welded or riveted.

3. Receptacles may be fitted with safety valves having an opening of adequate section. If the receptacles are fitted with safety valves, each receptacle must have not more than two valves, of which the total section of free passage at the seating of the valve or valves shall amount to at least 20 cm<sup>2</sup> for each volume of 30 m<sup>3</sup> or fraction of such volume of the capacity of the receptacle. These valves must open automatically under a pressure ranging between 0.9 and 1.0 times the test pressure of the receptacle to which they are fitted; they shall be of a type able to withstand dynamic effects. The use of deadweight or counterweight valves is prohibited.

4. Piping and other fittings capable of being in communication with the interior of the receptacle must be so constructed as to be able to withstand the same test pressure as the receptacle.
  5. Closing devices shall be so arranged that they cannot be operated by unqualified persons.
  6. Receptacles of tank wagons must be so constructed as to be electrically earthed.
  7. Only receptacles whose maker has guaranteed that the metals and weldings can withstand shock at a minimal temperature equal to or less than  $-40^{\circ}$  C may be used for gases which, during loading or carriage, reach this temperature.
  8. Receptacles intended for the carriage of hydrogen fluoride (item 5) must not be riveted. All their openings shall be above the level of the liquid phase and no piping, other than that ending in the upper part of the receptacle, shall traverse their walls.
  9. The capacity of each receptacle intended for gases of items 4 to 8 and 14 must be determined, under the supervision of an expert recognised by the competent authority, by weighing or by volumetric measurement of the quantity of water required to fill the receptacle; the error in measurement of the capacity of the receptacle must be less than 1%. Determination by calculation based on the dimensions of the receptacle is not allowed.
  10. By derogation from the provisions of marg. 146 (3), the periodic inspections shall be repeated:
    - i. In the case of receptacles intended for the carriage of town gas [item 1 (b)], boron trifluoride [item 3], hydrogen bromide, hydrogen fluoride, hydrogen sulphide, chlorine, sulphur dioxide, nitrogen dioxide (item 5), phosgene [item 8 (a)] and hydrogen chloride, anhydrous (item 10): every 3 years;
    - ii. In the case of receptacles intended for the carriage of the other compressed and liquefied gases and also for ammonia dissolved under pressure (item 14): every 6 years.
- (b) If several receptacles are permanently fixed to the wagon and connected by a manifold, the following regulations are applicable:
1. The receptacles of a wagon must contain only one and the same compressed or liquefied gas.
  2. If one of the receptacles is fitted with a safety valve, all must be so fitted.
  3. Filling and emptying devices may be fixed to the manifold.
  4.
    - i. If the receptacles are intended to contain compressed gases harmful to the respiratory organs or entailing a poison risk, each receptacle must be isolated by means of a valve. (The compressed gases which are considered harmful to the respiratory organs or having a poison risk are: carbon monoxide, water gas, synthesis gases, town gas, compressed oil gas, boron trifluoride, and mixtures of carbon monoxide, water gas, synthesis gases or town gas.)
    - ii. If the receptacles are intended to contain compressed gases harmless to the respiratory organs or not entailing a poison risk, it is not necessary for each receptacle to be isolated by means of a valve. (The compressed gases which are considered harmless to the respiratory organs or not having a poison risk are: hydrogen, methane, mixtures

of hydrogen and methane, oxygen, mixtures of oxygen with carbon dioxide, nitrogen, compressed air, the mixture of 20% nitrogen and 80% oxygen, helium, neon, argon, krypton, mixtures of rare gases, mixtures of rare gases with oxygen, mixtures of rare gases with nitrogen.)

- iii. If the receptacles are intended to contain either liquefied gases harmful to the respiratory organs or entailing a poison risk, or ammonia dissolved under pressure in water, each shall be filled separately and shall remain isolated by a closed and sealed valve. (The liquefied gases which are considered harmful to the respiratory organs or having a poison risk are: hydrogen bromide, hydrogen fluoride, hydrogen sulphide, ammonia, chlorine, sulphur dioxide, nitrogen dioxide, T gas, methyl vinyl ether, chloromethane, bromomethane, phosgene, cyanogen chloride, vinyl bromide, methylamine, dimethylamine, trimethylamine, ethylamine, ethylene oxide, methanethiol, mixtures of carbon dioxide with ethylene oxide and hydrogen chloride, anhydrous.)
- iv. If the receptacles are intended to contain liquefied gases harmless to the respiratory organs or not entailing a poison risk, they must not be capable of being isolated by means of valves. (The liquefied gases which are considered harmless to the respiratory organs or not having a poison risk are: liquefied oil gas, propane, cyclopropane, propene, butane, isobutane, butadiene, butene, isobutene, mixtures A, A 0, A I, B and C, dimethyl ether, chloroethane, vinyl chloride, dichlorodifluoromethane, dichlorofluoromethane, chlorodifluoromethane, dichlorotetrafluoroethane, chlorotrifluoroethane, chlorodifluoroethane, chlorotrifluoroethylene, bromochlorodifluoromethane, difluoroethane, octafluorocyclobutane, mixtures F 1, F 2 and F 3, xenon, carbon dioxide, nitrous oxide, ethane, ethylene, sulphur hexafluoride, chlorotrifluoromethane, bromotrifluoromethane, trifluoromethane, vinyl fluoride and difluoroethylene.)

(c) If the receptacles are removable\*, the following regulations apply:

1. They must be fixed to the underframe of the wagon so that they cannot move.
2. They must not be connected by a manifold.
3. If the receptacles are capable of being rolled, the valves must be provided with protective caps.

(3) By derogation from marg. 132 (3), receptacles of tank wagons may be used for the carriage of several liquefied gases (multi-purpose tanks) on the following conditions:

(a) These receptacles may carry any one of the substances listed in one and the same of the following groups:

Group 1: hydrocarbons of items 6 and 7;

Group 2: chlorinated and fluorinated derivatives of hydrocarbons of item 8 (b) and (c);

Group 3: ammonia (item 5), methylamine, dimethylamine, trimethylamine, and ethylamine [item 8 (a)];

\* The term "removable receptacle" means a receptacle, which, while constructed to fit the special apparatus of the wagon, can, however, be removed from it only after the means of attachment have been dismantled.

Group 4: chloromethane, bromomethane, and chloroethane [item 8 (a)];

Group 5: T gas (item 5) and ethylene oxide [item 8 (a)].

- (b) The test pressure laid down in marg. 160 (2) for the substance actually carried must be equal to or less than that for which the receptacle has been tested.
- (c) The maximum load allowed in kg must be determined on the basis of the degree of filling laid down in marg. 160 (2) for the substance actually carried.
- (d) Receptacles which have been filled with one of the substances of a group must be completely emptied of liquefied gas, then depressurized before being loaded with another substance belonging to the same group.

(4) If tank wagons intended for the carriage of liquefied gases of items 4 to 8 are fitted with thermal insulation, this shall be:

- (a) 1. Composed of a sheet-metal covering of a minimum thickness of 1.5 mm, or made of wood or of another suitable material having a similar protective value. This covering must be applied at least to the upper third and at most to the upper half of the tank and must be separated from the receptacle by an air space about 4 cm wide; or
2. Composed of a complete covering of adequate thickness of insulating materials (for example cork or asbestos);
- (b) Designed so as not to hinder easy inspection of the devices for emptying and filling.

NOTE. 1. As regards heat insulation of battery wagons used for the carriage of gases of items 9 and 10, see marg. 160 (3) (b) 3.

2. Painting a tank is not considered as thermal insulation.

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(1) For receptacles of tank wagons intended for the carriage of gases of items 1 to 3, reference should be made to marg. 149 (1) as regards test pressures and to marg. 149 (2) as regards the maximum filling pressures.

(2) For receptacles of tank wagons intended for the carriage of liquefied gases of items 4 to 8, the values of the test pressure and maximum degrees of filling allowed are:

- (a) If the diameter of the receptacles is not greater than 1.5 m, the values given in marg. 150 (2);
- (b) If the diameter of the receptacles is greater than 1.5 m, the values\* given below:

	Item	Minimum test pressure for receptacles		Maximum weight of liquid per litre capacity kg
		with thermal insulation kg/cm <sup>2</sup>	without thermal insulation kg/cm <sup>2</sup>	
Liquefied oil gas .....	4	33	37	0.38
Hydrogen bromide .....	5	50	55	1.23
Hydrogen fluoride .....	5	10	10	0.84
Hydrogen sulphide .....	5	43	48	0.67
Anhydrous ammonia .....	5	26	29	0.53
Chlorine .....	5	17	19	1.25
Sulphur dioxide .....	5	10	12	1.23
Nitrogen dioxide .....	5	10	10	1.30
T gas .....	5	24	26	0.73
Propane .....	6	21	23	0.43
Cyclopropane .....	6	18	21	0.53
Propene .....	6	25	28	0.43

	Item	Minimum test pressure for receptacles		Maximum weight of liquid per litre capacity kg
		with thermal insulation kg/cm <sup>2</sup>	without insulation kg/cm <sup>2</sup>	
Butane.....	6	10	10	0.51
Isobutane.....	6	10	10	0.49
Butadiene.....	6	10	10	0.55
Butene.....	6	10	10	0.53
Isobutene.....	6	10	10	0.52
Mixture A.....	7	10	10	0.50
Mixture A 0.....	7	12	14	0.47
Mixture A 1.....	7	16	18	0.46
Mixture B.....	7	20	23	0.43
Mixture C.....	7	25	27	0.42
Dimethyl ether.....	8 (a)	14	16	0.58
Methyl vinyl ether.....	8 (a)	10	10	0.67
Chloromethane.....	8 (a)	13	15	0.81
Bromomethane.....	8 (a)	10	10	1.51
Chloroethane.....	8 (a)	10	10	0.80
Phosgene.....	8 (a)	15	17	1.23
Vinyl chloride.....	8 (a)	10	10	0.81
Vinyl bromide.....	8 (a)	10	10	1.37
Methylamine.....	8 (a)	10	11	0.58
Dimethylamine.....	8 (a)	10	10	0.59
Trimethylamine.....	8 (a)	10	10	0.56
Ethylamine.....	8 (a)	10	10	0.61
Ethylene oxide.....	8 (a)	10	10	0.78
Methanethiol.....	8 (a)	10	10	0.78
Dichlorodifluoromethane.....	8 (b)	15	16	1.15
Dichlorofluoromethane.....	8 (b)	10	10	1.23
Chlorodifluoromethane.....	8 (b)	24	26	1.03
Dichlorotetrafluoroethane.....	8 (b)	10	10	1.30
Chlorotrifluoroethane.....	8 (b)	10	10	1.20
Chlorodifluoroethane.....	8 (b)	10	10	0.99
Chlorotrifluoroethylene.....	8 (b)	15	17	1.13
Bromochlorodifluoromethane.....	8 (b)	10	10	1.61
1,1-difluoroethane.....	8 (b)	14	16	0.79
Octafluorocyclobutane.....	8 (b)	10	10	1.34
Mixture F 1.....	8 (c)	10	11	1.23
Mixture F 2.....	8 (c)	15	16	1.15
Mixture F 3.....	8 (c)	24	27	1.03

\* 1. The prescribed test pressures are:

- (a) If the receptacles are fitted with thermal insulation, at least equal to the vapour pressures of the liquids at 60° C, reduced by 1 kg/cm<sup>2</sup>, but at least 10 kg/cm<sup>2</sup>;
- (b) If the receptacles are not fitted with thermal insulation, at least equal to the vapour pressures of the liquids at 65° C, reduced by 1 kg/cm<sup>2</sup>, but at least 10 kg/cm<sup>2</sup>.

2. In view of the high degree of toxicity of phosgene [item 8 (a)], the minimum test pressure for this gas is fixed at 15 kg/cm<sup>2</sup> if the receptacle is fitted with thermal insulation and at 17 kg/cm<sup>2</sup> if not so fitted.

3. The maximum values prescribed for filling in kg/litre are calculated in the following manner:  
maximum filling allowed = 0.95 × density of the liquid phase at 50° C.

(3) For receptacles of tank wagons intended for the carriage of liquefied gases of items 9 and 10, the test pressures and maximum degrees of filling allowed are:

- (a) If the conditions set out under (b) below are not fulfilled, those of marg. 150 (3) and (4);

(b) If these receptacles:

1. Are placed in one or several rows and permanently fixed to the vehicle,
2. Are joined to one another by a manifold without being capable of being isolated from one another, in conformity with marg. 159 (2) (b) 4. iv. (i.e. forming a battery), and
3. Are covered with a common roofing serving as a thermal insulation in conformity with the spirit of marg. 159 (4),

the values\* are:

	Item	Minimum test pressure kg/cm <sup>2</sup>	Max. weight of liquid per litre of capacity kg
Xenon .....	9	120	1.30
Carbon dioxide .....	9	{ 225	{ 0.78
Nitrous oxide .....	9	190	{ 0.73
Ethane .....	9	225	0.78
Ethylene .....	9	120	0.32
		{ 225	{ 0.36
		120	{ 0.25
Sulphur hexafluoride .....	10	120	1.34
Chlorotrifluoromethane .....	10	{ 225	{ 1.12
		120	{ 0.96
Bromotrifluoromethane .....	10	120	1.50
Trifluoromethane .....	10	250	0.99
Vinyl fluoride .....	10	225	0.65
1,1-difluoroethylene .....	10	225	0.78

(4) The maximum load of the battery of receptacles allowed according to para. (3) (b) must be determined by the expert approved by the competent authority.

(5) Where, for the carriage of substances of items 9 and 10, receptacles are used which have been subjected to a test pressure lower than that indicated in para. (3) (b), the degree of filling shall be so calculated that the pressure reached in the interior of the receptacle by the substance in question at 55° C does not exceed the test pressure stamped on the receptacle. In this case the maximum load allowed must be determined by the expert approved by the competent authority.

(6) For receptacles of tank wagons intended for the carriage of ammonia dissolved under pressure (item 14), the test pressures and the maximum degree of filling allowed are:

	Item	Minimum test pressure kg/cm <sup>2</sup>	Max. weight of liquid per litre of capacity kg
Ammonia dissolved under pressure in water:			
With more than 35% and not more than 40% ammonia .....	14 (a)	10	0.80
With more than 40% and not more than 50% ammonia .....	14 (b)	12	0.77

\* By virtue of marg. 159 (2) (b) 4. iii., mixtures of carbon dioxide with ethylene oxide (item 9) and hydrogen chloride, anhydrous (item 10) are not to be accepted in battery wagons.

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(1) In addition to the provisions of marginals 141 (1), 143 (1), first paragraph and second paragraph, first sentence, and 145 (1), the following regulations are applicable to tank-wagon receptacles for the gases of items 11 to 13:

- (a) The materials and construction of the receptacles must be in conformity with the regulations in Appendix II, under B, marg. 1250 to 1255. All the mechanical characteristics of the materials used must be established for each receptacle at the first test; in so far as the impact strength and the bending coefficient are concerned, see Appendix II, under B, marg. 1265 to 1286.
- (b) Except for gases of item 11 when the receptacles are in communication with the atmosphere, receptacles shall be so closed and leakproof as to prevent gas from escaping.
- (c) Tanks containing gases of item 11 which are not in permanent communication with the atmosphere and tanks containing gases of items 12 and 13 must be fitted with two independent safety valves; each of the valves must be so designed as to allow the gases to escape from the receptacle without a rise of pressure at any time to more than 10% above the working pressure shown on the receptacle.

The safety valves must be able to open at the working pressure shown on the receptacle. They must be so constructed that they work perfectly even at the lowest working temperature. The reliability of their functioning at the lowest temperature must be established and checked by the testing of each valve or of a sample of valves of the same type of construction.

- (d) The vents and safety valves of the receptacles shall be so designed as to prevent the liquid from splashing out.
- (e) Closing devices shall be so arranged that they cannot be operated by unqualified persons.
- (f) The safety valves of receptacles intended for the carriage of gases of item 12 shall be fitted with an efficient flame-trap.
- (g) Receptacles of tank wagons must be so constructed as to be electrically earthed.

(2) The multiple use of tank wagons intended for the carriage of deeply refrigerated liquefied gases of the same item is permitted on condition that all the regulations relative to the different gases to be carried by these tanks be observed. The multiple use must be authorised by an approved expert.

(3) The receptacles for gases of items 11 to 13 shall be thermally insulated. The insulating protection must be protected from shocks by means of a complete metallic sheathing. If the space between the receptacle and the metallic sheathing is airless (insulation by vacuum), the protective sheathing must be designed to withstand an external pressure of at least 1 kg/cm<sup>2</sup> without distortion. If the sheathing is closed in a gas-tight manner (e.g. in the case of insulation by vacuum), a device must ensure that no dangerous pressure is produced in the insulating layer when the receptacle or its fittings are insufficiently gas-tight. The device must prevent moisture from penetrating into the insulation.

(4) Tank wagons intended for the carriage of liquid air, liquid oxygen, or liquid mixtures of oxygen with nitrogen of item 11 must not contain any combustible material either in the thermal insulation arrangement, or in the fastening to the underframe. It is forbidden to use materials containing grease or oil to render joints gas-tight or lubricate closing devices.

(5) For receptacles of tank wagons intended for the carriage of gases of items 11 to 13, all receptacles must, before being first put into service, undergo



a hydraulic-pressure test; the receptacles must not, at the time of this test, sustain any permanent deformation. The test pressure shall be:

- (a) For receptacles intended for gases of item 11, in permanent communication with the atmosphere, 2 kg/cm<sup>2</sup>;
- (b) For receptacles fitted with safety valves, 1.5 times the maximum permissible working pressure shown on the receptacle, but not less than 3 kg/cm<sup>2</sup>. For receptacles fitted with insulation by vacuum, the test pressure is 1.5 times the working pressure which has been increased by 1 kg/cm<sup>2</sup>.

The hydraulic-pressure test shall be carried out before the insulation is put in position.

(6) Each receptacle shall be subjected to a periodic inspection every six years. This inspection is to comprise:

- (a) For receptacles intended for gases of item 11, in permanent communication with the atmosphere, the checking of the internal condition and a leakage test carried out with the gas contained in the receptacle or with an inert gas, at a pressure of 1 kg/cm<sup>2</sup>;
- (b) For receptacles fitted with safety valves:

After 6 years' service and thereafter every 12 years, the checking of the internal condition and a leakage test. The leakage test shall be carried out, after checking the internal condition, with the gas contained in the receptacle or with an inert gas, at a pressure corresponding to 1.2 times the working pressure shown on the receptacle. If this test pressure is greater than 10 kg/cm<sup>2</sup>, the leakage test shall be carried out, if so required by the national regulations, as a hydraulic-pressure test. In the leakage test, verification is to be effected solely by manometer, without the insulation being removed. The duration of the test shall be 8 hours from the time when temperature equalisation has been achieved. The pressure must not fall off during the test; however, when the test is carried out with gas, it is necessary to take account of changes in pressure which arise from the nature of the testing medium and from variations in temperature. If the leakage test was unsatisfactory, the cause should be established and, to this end, if necessary, the insulation should be removed;

After 12 years' service and thereafter every 12 years, the checking of the external and internal condition and a hydraulic-pressure test under the pressure prescribed for the first test. For this test, it is necessary to remove the insulation.

NOTE. When carrying out the leakage test with gas, changes of pressure arising from the conditions of the test are possible, in particular from the fact that the pressure depends on the temperature and its variations. A 5% decrease of pressure may generally be considered admissible. The expert must take account in each case of all the circumstances essential to an evaluation.

For receptacles fitted with valves, the condition of the valves and their opening at the working pressure shown on the receptacle must be checked every 3 years by an approved expert.

NOTE. It is recommended that the sender of the receptacles check each safety valve at least every 6 months as to its external condition and check the mechanical operation of the cone of the valve with a suitable tool at the same time.

(7) For receptacles fitted with valves, the degree of filling must be lower than a value such that, when the contents reach the temperature at which the vapour pressure equals the operating pressure of the valves, the volume of the liquid would reach 95% of the capacity of the tank for inflammable gases and 98% for the other gases at that temperature.

162 (1) By derogation from marg. 148, the marks on the receptacles required by the marginal in question and the markings on the panels of all the tank wagons must be effected in conformity with the following provisions.

(2) Marks on the receptacles, engraved either on the tanks themselves, without affecting their strength, or on a plate made of non-oxidisable metal, welded to the receptacles:

For all receptacles:

The name or mark of the maker and the number of the receptacle;

The test pressure, the date (month, year) of the last test and the stamp of the expert who carried out the test; in addition:

(a) For receptacles intended for the carriage of one substance only:

The name of the gas in full;

For compressed gases (items 1 to 3), the maximum filling pressure allowed for the receptacle;

For liquefied gases (items 4 to 13) and for ammonia dissolved under pressure in water (item 14), the capacity in litres and the maximum load allowed in kg;

(b) For multi-purpose receptacles:

The capacity in litres;

(c) For tanks containing deeply refrigerated liquefied gases of items 11 to 13:

The working pressure for gases of item 11 contained in tanks fitted with safety valves and for gases of items 12 and 13;

For steel receptacles, the lowest temperature at which they may be used;

(d) For receptacles fitted with thermal insulation in accordance with marg. 159 (4) and 161 (3):

The marking "*calorifugé*" or "*wärmeisoliert*".

(3) If the markings specified in (2) are not visible from the outside, they shall be repeated on the thermal insulation.

(4) Marking in paint on removable receptacles:

The name of the owner;

The tare of the receptacle including fittings such as valves, closing devices, handling or rolling devices, etc.

(5) Marks engraved on the plate immovably fixed on the framework of the battery:

The test pressure;

The number of receptacles;

The total capacity in litres of the receptacles forming the battery;

The name of the gas in full;

For liquefied gases of items 9 and 10, the maximum load in kg allowed for the battery.

NOTE. If the plate is not situated near the filling point, the marking giving the maximum load must be repeated on the wagon close to this point. This marking may be in paint.

(6) Marking in paint on the panels of the wagons:

For all wagons:

The name of the owner;

The tare of the wagon including fittings; in addition:

- (a) For wagons carrying receptacles intended for the carriage of one substance only:

The name of the gas in full;

For liquefied gases of items 4 to 13 and ammonia dissolved under pressure in water (item 14), the maximum load in kg;

- (b) For wagons carrying multi-purpose receptacles:

The name in full of all the gases allowed to be carried in the receptacles with a marking of the maximum load allowed in kg for each gas;

NOTE. When these wagons are handed over for carriage, either loaded or empty, only the markings relevant to the gas actually loaded must be visible; all markings relating to other gases must be covered up.

- (c) For wagons carrying receptacles fitted with thermal insulation:

The marking “*calorifugé*” or “*wärmeisoliert*”.

(7) The receptacles of tank wagons for liquefied gases of items 4 to 13 shall be marked by an unbroken orange-coloured band, about 30 cm wide, encircling the tank wagon receptacle at mid-height.

*c. For small containers*

- 163 (1) With the exception of packages containing phosgene and cyanogen chloride [item 8 (a)] and gases of item 11, packages containing substances set out in this Class may be carried in small containers. However, packages containing phosgene in small quantities, packed in conformity with marg. 135, may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 165 must be applied to the contents of a small container.

(3) With the exception of fluorine (item 3), cyanogen chloride [item 8 (a)] and gases of items 11 to 13, substances of Class I d may also be carried in small tank containers.

2. *Marking and danger labels on wagons and on small containers* (see Appendix IX)

- 164 (1) Tank wagons containing gases of items 1 to 13 shall bear on both sides labels conforming to model No. 10.

(2) Wagons in which packages containing articles of items 16 (b) and 17 (a) are loaded, forwarded in full wagon loads, shall bear on both sides labels conforming to model No. 2.

(3) Small containers in which packages containing articles of items 16 (b) and 17 (a) are loaded shall bear a label conforming to model No. 2.

(4) Small containers enclosing packages bearing a label conforming to model No. 9 shall also bear this label.

(5) Small tank containers for liquefied gases of items 4 to 10 shall be marked by an unbroken orange-coloured band, about 30 cm wide, encircling the container at mid-height.

E. PROHIBITIONS ON MIXED LOADING

- 165 (1) Gases of Class I d must not be loaded in the same wagon together with substances and articles of Class I a (marg. 21).

(2) Fluorine (item 3) must not be loaded in the same wagon together with articles of Class I b (marg. 61).

(3) Phosgene and cyanogen chloride [item 8 (a)] must not be loaded in the same wagon together:

(a) With substances of Class III c (marg. 371);

(b) With substances of Class V, items 2 (a) and 3 (a) (marg. 501).

166 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon [art. 6, para. 10 (d), of CIM].

#### F. EMPTY PACKAGINGS

167 (1) Receptacles of item 18 shall be closed in the same manner as though they were full.

(2) The description in the consignment note must read "*Empty receptacle, I d, item 18, RID*". This description must be *underlined in red*.

#### G. OTHER REGULATIONS

168 (1) In so far as marg. 131 to 167 do not prescribe any conditions to be fulfilled by receptacles intended for the carriage of gases which are compressed, liquefied or dissolved under pressure, the regulations of the country of departure shall apply to receptacles, whether the receptacles are separate from or form part of tank wagons.

(2) The following transitional provisions shall apply to receptacles (including receptacles for tank wagons) for gases which are compressed, liquefied or dissolved under pressure:

(a) Receptacles already in service are, with the following exceptions, to be accepted for international carriage so long as the regulations of the Contracting State in which the tests laid down in marg. 146 have been carried out so permit and so long as the intervals prescribed for the periodic inspections in marg. 146 (3), 147 and 159 (2) (a) 10. are observed.

Receptacles and tank wagons intended for the carriage of hydrogen chloride, anhydrous (item 10) are not to be accepted for carriage unless they satisfy the requirements of RID.

Receptacles containing ammonia dissolved under pressure in water of item 14 (a) are not to be accepted for carriage unless they have been subjected to a test pressure of 10 kg/cm<sup>2</sup> [see marg. 151 (1)];

(b) For receptacles which were manufactured under the previous regulations (yield stress 2/3 instead of 3/4), neither the test pressure nor the filling pressure may be increased [see marg. 141 (1)];

(c) Receptacles in conformity with marg. 142 (1) (b) and (c) whose valves have attachment systems not in conformity with the provisions of marg. 143 (1) may continue to be used until the date on which they must undergo the periodic inspection prescribed in marg. 146 (3);

(d) Receptacles of tank wagons intended for the gases of items 1 to 10 and 14 which are still fitted with safety valves not in conformity with the provisions of marg. 159 (2) (a) 3. shall also be allowed for use, on condition that the valves are provided with a suitable device allowing them to be blanked off and indicating in what position they are blanked.

(e) Receptacles of tank wagons which do not have the orange-coloured band referred to in marg. 162 (7), are allowed for use until 31 March 1971. The transitional period for small tank containers which do not have the orange-coloured band referred to in marg. 164 (5) expires on 31 March 1968.

169-179

CLASS I e. SUBSTANCES WHICH GIVE OFF INFLAMMABLE GASES  
ON CONTACT WITH WATER

1. *List of substances*

**180** Among the substances and articles covered by the heading of Class I e, only those listed in marg. 181 are to be accepted for carriage, and then only subject to the conditions laid down in marg. 181 to 199. These substances and articles to be accepted for carriage under certain conditions are to be considered as substances and articles of RID.

- 181**
1. (a) Alkali and alkaline earth metals, e.g. *sodium, potassium, calcium*, as well as *alkali metal alloys, alkaline earth metal alloys* and *alloys of alkali and alkaline earth metals*;
  - (b) *Alkali metal amalgams* and *alkaline earth metal amalgams*;
  - (c) *Alkali metal dispersions*.
  2. (a) *Calcium carbide* and *aluminium carbide*;
  - (b) Alkali and alkaline earth metal *hydrides* (e.g. *lithium hydride, calcium hydride*), *mixed hydrides* and *borohydrides* and *aluminium hydrides* of alkali and alkaline earth metals;
  - (c) *Alkali silicides*;
  - (d) *Calcium silicide* in powder, grains or lumps, containing more than 50% silicon, *manganese calcium silicide (silico-manganese-calcium)*;
  - (e) *Alloys of magnesium with manganese*.
  3. *Amides* of alkali and alkaline earth metals, e.g. *sodamide (sodium amide)*. See also marg. 181 a.

NOTE. Calcium cyanamide is not subject to the provisions of RID.

4. *Trichlorosilane (silicochloroform)*.
  5. *Empty receptacles* uncleaned, including the receptacles of tank wagons and small containers, which have contained substances of Class I e.
- 181a** Sodamide (item 3) in quantities not exceeding 200 g per package is not subject to the provisions of chapter 2 "Conditions of carriage" if it is packed in leak-proof receptacles, not liable to attack by the contents, and if these receptacles are packed with care in a strong, leakproof wooden packaging with a leakproof closure.

2. *Conditions of carriage*

(The regulations relating to empty receptacles are to be found under F.)

A. PACKAGES

1. *General conditions for packing*
- 182**
- (1) Packagings shall be so closed and leakproof as to prevent the penetration of moisture and any loss of the contents.
  - (2) The materials of which the receptacles and their closures are made must not be liable to attack by the contents or form harmful or dangerous compounds therewith. Receptacles must in all cases be dry.
  - (3) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the

normal requirements of carriage. In particular, in the case of solids immersed in a liquid, receptacles and their closures must, unless the section headed "Packing of individual substances" provides otherwise, be able to withstand any pressure which, the presence of air also being taken into account, may arise inside the receptacles in normal carriage. For this purpose a free space must be left, account being taken of the difference between the temperature of the substances at the moment of filling and the highest mean temperature which they are likely to reach during carriage. Solid substances shall be firmly secured in their packagings, and inner packagings shall be firmly secured in outer packagings. Unless otherwise specified in the section "Packing of individual substances", inner packagings may be enclosed in outer packagings, either singly or in groups.

(4) Bottles and other glass receptacles must be free from faults of a nature liable to impair their strength; in particular, internal stresses must have been suitably relieved. The thickness of the walls must in no case be less than 2 mm.

The tightness of the closure system must be ensured by an additional device (cap, crown, seal, binding, etc.) capable of preventing any loosening of the closure system during carriage.

(5) Cushioning material shall be suited to the nature of the contents.

## 2. *Packing of individual substances*

183

(1) Substances of item 1 shall be packed:

(a) In receptacles made of sheet iron, lead-lined sheet iron or tinfoil. However, for substances of item 1 (b), receptacles made of lead-lined sheet iron or tinfoil are not to be accepted. These receptacles, with the exception of iron drums, must be placed in wooden packing cases or in protective iron baskets; or

(b) In quantities not exceeding 1 kg per receptacle in receptacles made of glass or stoneware. Not more than 5 of these receptacles at a time must be packed in a wooden packing case with a leakproof lining of ordinary sheet iron, lead-lined sheet iron or tinfoil, assembled by soldering. For glass receptacles containing quantities not exceeding 250 g, the lined wooden case may be replaced by an outer receptacle made of ordinary sheet iron, lead-lined sheet iron or tinfoil. Glass receptacles shall be secured in the packing cases by incombustible cushioning material.

(2) If a substance of item 1 (a) is not packed in a welded metal receptacle with a lid hermetically sealed by soldering, then:

(a) It must be completely covered by mineral oil whose flash-point is above 50° C, or sufficiently sprinkled to ensure that the lumps are coated with this oil; or

(b) The air in the receptacle must be completely replaced by a protective gas (for example, nitrogen) and the receptacle sealed in a gas-tight fashion; or

(c) The substance must be poured into the receptacle, which must be filled to the brim and closed, after cooling, in gas-tight fashion.

(3) Iron receptacles must have walls at least 1.25 mm thick. If they weigh, with their contents, more than 75 kg, they must be hard-soldered or welded. If they weigh more than 125 kg they must, in addition, be fitted with end bands and rolling hoops.

(4) For the carriage of sodium, potassium and alloys of sodium and potassium [item 1 (a)] in tank wagons or in small containers, see marg. 193 and 194 (3).

- 184 (1) Substances of item 2 shall be packed:
- (a) In receptacles made of sheet iron, lead-lined sheet iron or tinfoil. In the case of substances of item 2 (b) and (c) a receptacle must not contain more than 10 kg. These receptacles, with the exception of iron drums, must be placed in wooden packing cases or in protective iron baskets; or
  - (b) In quantities not exceeding 1 kg per receptacle, in receptacles made of glass, stoneware or a suitable plastics material. Not more than 5 of these receptacles must be packed in a wooden packing case with a leakproof lining of ordinary sheet iron, lead-lined sheet iron or tinfoil, assembled by soldering. For glass receptacles containing quantities not exceeding 250 g, the lined wooden case may be replaced by an outer receptacle made of ordinary sheet iron, lead-lined sheet iron or tinfoil. Glass receptacles shall be secured in the packing cases by incombustible cushioning material.
- (2) A package must not weigh more than 75 kg if it contains substances of item 2 (b) or (c), or more than 125 kg if it contains substances of item 2 (d) or (e).
- (3) For the carriage of calcium carbide [item 2 (a)] or of calcium silicide [item 2 (d)] in bulk, see marg. 192 and 194 (3).
- 185 Amides (item 3) shall be packed in quantities not exceeding 10 kg, in hermetically sealed metal boxes or drums, which shall be placed in wooden cases. A package must not weigh more than 75 kg.
- 186 (1) Trichlorosilane (silicochloroform) (item 4) must be packed in receptacles made of corrosion-resistant steel and having a capacity not exceeding 500 litres. The receptacles must be hermetically sealed; the closing device must be specially protected by a cap. The receptacles must be constructed as pressure vessels for a working pressure of 4 kg/cm<sup>2</sup> and tested in conformity with the regulations governing pressure vessels in the country of departure. Receptacles with a capacity not exceeding 250 litres must have a wall thickness of at least 2.5 mm, and those with a higher capacity a wall thickness of at least 3 mm.
- (2) If filling is gauged by weight, the degree of filling shall be 1.14 kg/l at the most. If it is carried out by visual check, it must not exceed 84.5%.
3. *Mixed packing*
- 187 (1) Substances grouped under the same item may be packed together in the same package. The inner packagings shall conform to the requirements prescribed for each substance, and the outer packaging shall be that laid down for the substances of the item in question.
- (2) If smaller quantities are not prescribed in the section "Packing of individual substances", and if special conditions are not set out below, the substances of this Class, in quantities not exceeding 6 kg in the case of solid substances or 3 litres in the case of liquid substances for the total amount of substances listed under a same item or a same letter, may be placed together in the same package either with substances of another item or another letter of the same Class or with substances or articles belonging to other Classes—as long as mixed packing is also permitted for these—or with other goods.
- Inner packagings must comply with the general and special packaging conditions. In addition, the general regulations of marg. 4 (6) and (8) must be observed.
- A package must not weigh more than 150 kg, or more than 75 kg if it contains fragile receptacles.

*Special conditions:*

Item	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
1 (a)	Alkali and alkaline earth metals, e.g. sodium, potassium, calcium, barium. —In fragile receptacles —In other receptacles	500 g 1 kg	500 g 1 kg	The limits of 500 g or 1 kg apply to the alkali and alkaline earth metals of item 1 (a) and to the alkali and alkaline earth metal hydrides of item 2 (b) in respect of the aggregate weight of these substances. The alkali and alkaline earth metals and the substances of item 2 (b) may not be packed together with acids or with liquids containing water.
2 (a)	Calcium carbide	Mixed packing not permitted		
2 (b)	Alkali and alkaline earth metal hydrides (e.g. lithium hydride, calcium hydride), mixed hydrides, borohydrides and aluminium hydrides —In fragile receptacles —In other receptacles	500 g 1 kg	500 g 1 kg	
4	Trichlorosilane	Mixed packing not permitted		

4. *Marking and danger labels on packages* (see Appendix IX).

188

(1) With the exception of the leakproof metal drums containing calcium carbide [item 2 (a)] carried in full wagon loads, every package containing substances of Class I e shall bear a label conforming to model No. 7.

(2) Every package containing trichlorosilane of item 4 shall bear in addition a label conforming to model No. 2.

(3) Packages containing fragile receptacles not visible from the outside shall bear a label conforming to model No. 9. If the fragile receptacles contain liquids, the packages shall in addition, except in the case of sealed ampoules, bear labels conforming to model No. 8; these labels shall be affixed high up on two opposite sides of cases or in an equivalent manner when other packagings are used.

## B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

189

No restrictions in respect of *grande vitesse* and *petite vitesse*.

## C. PARTICULARS IN THE CONSIGNMENT NOTE

190

The description of the goods in the consignment note must conform to one of the names printed in *italics* in marg. 181. Where the name of the substance is not indicated in the case of item 1, the trade name must be used. The description of the goods must be *underlined in red* and followed by *particulars of the Class, the item number (together with the letter, if any), and the initials "RID"* [e.g. *I e, item 2 (a), RID*].

## D. TRANSPORT EQUIPMENT

1. *Conditions relating to wagons and their loading*a. *For packages*



- 191 (1) Packages containing substances of Class I e shall be loaded in covered wagons.
- (2) Receptacles containing calcium carbide [item 2 (a)] may also be loaded in sheeted open wagons.
- b. *For carriage in bulk*
- 192 (1) Calcium carbide [item 2 (a)] and calcium silicide in lumps [item 2 (d)] may be loaded in bulk in specially designed wagons.
- (2) Receptacles of specially designed wagons and their closures shall be in conformity with the general packing conditions of marg. 182 (1), (2) and (3). They must be made in such a way that the openings used for loading and unloading can be closed hermetically.
- (3) When in lumps, calcium silicide [item 2 (d)] may also be loaded in bulk in covered wagons.
- c. *For tank wagons*
- 193 (1) Sodium, potassium and alloys of sodium and potassium [item 1 (a)] may be carried in specially designed tank wagons.
- (2) Receptacles of specially designed tank wagons and their closures shall be in conformity with the general packing conditions of marg. 182 (1), (2) and (3). Their orifices and openings (cocks, casings, manholes, etc.) must be protected by a leakproof cover which can be closed by bolting.
- (3) When these wagons are handed over for carriage, their covers must be bolted down and the temperature of the outer walls of the receptacles must not exceed 70° C.
- d. *For small containers*
- 194 (1) Packages containing substances set out in this Class may be carried in small containers.
- (2) The prohibitions on mixed loading laid down in marg. 196 must be applied to the contents of a small container.
- (3) Substances whose carriage in bulk or in tank wagons is permitted may be enclosed without packaging in small containers, which must comply with the requirements of marg. 192 or 193.
2. *Marking and danger labels on wagons and on small containers* (see Appendix IX).
- 195 (1) Specially designed wagons containing calcium carbide [item 2 (a)] or calcium silicide in lumps [item 2 (d)] shall have alongside the closure the following marking in clearly legible and indelible characters: "To be made leakproof after filling and emptying". The marking shall be in an official language of the country of origin and also in French, German or Italian unless the international tariffs or agreements concluded between the railway administrations provide otherwise.
- (2) Small containers in which substances of this Class are loaded shall bear a label conforming to model No. 7.
- Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.
- E. PROHIBITIONS ON MIXED LOADING
- 196 Substances of Class I e must not be loaded in the same wagon together:
- (a) With substances and articles of Class I a (marg. 21);
- (b) With articles of Class I b (marg. 61);

(c) With substances of Class VII (marg. 701).

197 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon [art. 6, para. 10 (d), of CIM].

F. EMPTY PACKAGINGS

198 (1) The receptacles of item 5 must be closed in the same manner and be leakproof in the same degree as though they were full.

(2) The description in the consignment note must read: "*Empty receptacles, I e, item 5, RID*". This description must be *underlined in red*.

G. OTHER REGULATIONS

199 No regulations.

CLASS II. SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION

1. *List of substances*

200 Among the substances and articles covered by the heading of Class II, only those listed in marg. 201 are to be accepted for carriage, and then only subject to the conditions set out in marg. 201 to 224. These substances and articles to be accepted for carriage under certain conditions are to be considered as substances and articles of RID.

201 1. *White or yellow phosphorus.*

2. *Compounds of phosphorus with alkali or alkaline earth metals, e.g. sodium phosphide, calcium phosphide, strontium phosphide.*

NOTE. Compounds of phosphorous with so-called heavy metals such as iron, copper, tin, etc., but with the exception of zinc (zinc phosphide is a substance of Class IV a, marg. 401, item 33), are not subject to the provisions of RID.

3. *Zinc alkyls, magnesium alkyls, aluminium alkyls and aluminium diethyl chloride.* See also marg. 201 a under (a).

4. *Nitrocellulose film waste free from gelatine, in reels, sheets or strips.*

NOTE. Nitrocellulose film waste free from gelatine is not to be accepted for carriage if it is in dusty or includes dusty portions.

5. (a) *Used rags and waste;*

(b) *Greasy or oily fabrics, wicks, cord or thread;*

(c) *The following greasy or oily substances: wool, hair, artificial wool, reclaimed wool (also called wool shoddy), cotton, recarded cotton, artificial fibres (rayon, etc.), silk, flax, hemp, and jute, also in the form of spinning or weaving waste.*

For (a), (b) and (c), see also marg. 201 a under (b).

NOTE. Wetted substances of item 5 (b) and (c) are not to be accepted for carriage.

6. (a) *Dust and powder of aluminium or zinc and mixtures of dust or powder of aluminium and zinc, also when greasy or oily; powder of zirconium and titanium; dust from blast-furnace filters;*

(b) *Dust, powder and fine shavings of magnesium and of magnesium alloys with a magnesium content of more than 80%, all free from particles capable of aiding combustion;*

(c) *The following salts of dithionous (hydrosulphurous) acid (H<sub>2</sub>S<sub>2</sub>O<sub>4</sub>): dithionites (hydrosulphites) of sodium, potassium, calcium, zinc;*

*(d) Metals in a pyrophoric form.*

For (a), see also marg. 201 a under (b) and (c); for (b) and (c), see also marg. 201 a under (b).

7. Freshly calcined *soot*. See also marg. 201 a under (b).
8. Freshly quenched *charcoal* in powder, grains or lumps. See also marg. 201 a under (b) and Class III b, marg. 331, item 1.

NOTE. By freshly quenched charcoal is meant:

In the case of charcoal in lumps, charcoal which has been quenched less than four days previously;

In the case of powdered charcoal and of granulated charcoal in a granule size or less than 8 mm in size, charcoal which has been quenched less than eight days previously, provided that it has been air-cooled in thin layers or by a process ensuring an equivalent degree of cooling.

9. Mixtures of granulated or porous combustible substances with constituents still liable to spontaneous oxidation, such as linseed oil or other natural drying oils, boiled or with added drying compounds, resin, resin oil, petroleum residues, etc. (e.g. the *substance known as cork waste, lupuline*) and oily residues from the bleaching of soya oil. See also marg. 201 a under (b) and Class III b, marg. 331, item 1.
10. *Paper, cardboard* and products made of paper or fibreboard (e.g. *wrappings and cardboard rings*), *wood fibre sheets, skeins of thread, fabrics, string, thread, spinning or weaving waste* all impregnated with oils, greases, natural drying oils, boiled or with added drying compounds or other impregnated substances liable to spontaneous oxidation. See also marg. 201 a under (b) and Class III b, marg. 331, item 1.

NOTE. Substances of item 10 are not to be accepted for carriage if their humidity exceeds the hygroscopic humidity.

11. The *substances* with an iron oxide base *having been used for purifying lighting gas (spent oxide of iron)*.

NOTE. If after storage and aeration the substance which has been used for purifying lighting gas (spent oxide of iron) is no longer liable to spontaneous combustion and if this is certified by the sender in the consignment note as follows, "*Substance not liable to spontaneous combustion*", it is not subject to the regulations of RID.

12. *Used yeast bags*, uncleaned. See also marg. 201 a under (b).
13. *Empty sodium nitrate bags* made of textile.

NOTE. Textile bags from which all the nitrate impregnating them has been completely removed by washing are not subject to the provisions of RID.

14. Empty iron drums, uncleaned, and empty receptacles of tank wagons, uncleaned, which have contained phosphorus of item 1.
15. Empty uncleaned receptacles which have contained substances of item 3.

NOTE re items 14 and 15. Empty packagings, which have contained other substances of Class II are not subject to the provisions of RID.

**201a** Substances handed over for carriage in conformity with the following provisions are not subject to the regulations of chapter 2 "Conditions of carriage":

- (a) Solutions of substances of item 3 in a concentration not exceeding 10% in solvents with a boiling-point not lower than 95° C, if their condition is such as to exclude any danger of spontaneous combustion and if this is certified by

the sender in the consignment note as follows: “*Substance not liable to spontaneous combustion*”; see, however, Class III a;

- (b) Substances of items 5 to 10 and 12, but excluding those of item 6 (d), if their condition is such as to exclude any danger of spontaneous combustion and if this is certified by the sender in the consignment note as follows: “*Substance not liable to spontaneous combustion*”; for substances of item 8 and certain substances of items 9 and 10, see, however, Class III b, marg. 331, item 1;
- (c) Dust and powder of aluminium or zinc [item 6 (a)], e.g. packed together with varnish for use in the manufacture of colours, if packed with care in quantities not exceeding 1 kg.

## 2. Conditions of carriage

(The regulations relating to empty packagings are to be found under F.)

### A. PACKAGES

#### 1. General conditions for packing

202

(1) Packagings shall be so closed and arranged as to prevent any loss of the contents.

(2) The materials of which the packagings and their closures are made must not be liable to attack by the contents or form harmful or dangerous compounds therewith.

(3) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. In particular, in the case of substances in the liquid state or immersed in a liquid or in solution, receptacles and their closures must, unless the section headed “Packing of individual substances” provides otherwise, be able to withstand any pressure which, the pressure of air also being taken into account, may arise inside the receptacles in normal carriage. For this purpose a free space must be left, account being taken of the difference between the temperature of the substances of the time of filling and the highest mean temperature which they are likely to reach during carriage. Solid substances shall be firmly secured in their packagings, and inner packagings shall be firmly secured in outer packagings. Unless otherwise specified in the section “Packing of individual substances”, inner packagings may be enclosed in outer packagings, either singly or in groups.

(4) Bottles and other glass receptacles must be free from faults liable to impair their strength; in particular, internal stresses must have been suitably relieved. The thickness of the walls must be not less than 3 mm in the case of receptacles which, with their contents, weigh more than 35 kg, and not less than 2 mm in the case of other receptacles.

The tightness of the closure system must be ensured by an additional device (cap, crown, seal, binding, etc.) capable of preventing any loosening of the closure system during carriage.

(5) When receptacles made of glass, porcelain, stoneware or similar materials are prescribed or allowed, they must be secured by cushioning material in protective packagings.

Cushioning material shall be suited to the nature of the contents; in particular, it shall be dry and absorbent if these are liquid or might exude liquid.

2. *Packing of individual substances*

- 203 (1) Phosphorus of item 1 shall be packed:
- (a) In leakproof tinplate receptacles hermetically closed and placed in wooden cases; or
  - (b) In sheet-iron drums closing hermetically. Press-on lids shall not be allowed. The thickness of the sheet iron of the body, base and lid shall be at least 1.5 mm. A package must not weigh more than 500 kg. If it weighs more than 100 kg, it shall be fitted with rolling hoops or strengthening ribs and shall be welded; or
  - (c) In quantities not exceeding 250 g per receptacle, in glass receptacles, hermetically closed, secured by cushioning material in leakproof tinplate receptacles, closed by soldering, and secured, likewise by cushioning material in wooden cases.
- (2) Receptacles and drums containing phosphorus shall be filled with water.
- (3) For carriage in tank wagons, see marg. 218.
- 204 (1) Substances of item 2 shall be packed in leakproof tinplate receptacles hermetically closed and placed in wooden cases.
- (2) Quantities of not more than 2 kg of these substances may also be packed in receptacles made of glass, porcelain, stoneware or similar materials, secured by cushioning material in wooden cases.
- 205 (1) Substances of item 3 shall be packed in receptacles made either of metal or of glass, porcelain, stoneware or similar materials, hermetically closed. Receptacles must not be filled beyond 90% of their capacity.
- (2) Metal receptacles shall be secured by cushioning material in protective packagings which, if they are not closed, shall be covered. If the covering consists of readily inflammable substances, it shall be rendered sufficiently fire-resistant to prevent its catching alight on contact with a flame. If the protective packaging is not closed, the package shall be fitted with means of handling and must not weigh more than 75 kg.
- (3) Receptacles made of glass, porcelain, stoneware or similar materials shall have a capacity not exceeding 5 litres and shall be secured by cushioning material in leakproof sheet-metal receptacles, hermetically closed.
- (4) Substances of item 3 may also be packed in hermetically closed drums, made of corrosion-resistant steel and having a capacity of not more than 300 litres and a wall thickness of at least 3 mm. These drums must withstand a test pressure of 10 kg/cm<sup>2</sup> and satisfy the conditions of marg. 141 (1) and (2) (b). The closure of the filling and emptying device must be ensured by a protective cap. Receptacles must not be filled beyond 90% of their capacity; however, with the liquid at a mean temperature of 50° C, an empty space of 5% must remain for safety purposes. When handed over for carriage, the liquid shall be under a layer of inert gas, at a pressure not exceeding 0.5 kg/cm<sup>2</sup>. Receptacles shall be tested in conformity with the provisions of marg. 146 (2) and (3). The tests shall be repeated every 5 years. The receptacles shall bear the following particulars in clearly legible and indelible characters:
- 1. The name of the substance in full, the name or mark of the maker or owner, and the number of the receptacle;
  - 2. The tare of the receptacle, including fittings and accessories;
  - 3. The test pressure, the date (month, year) of the last test and the stamp of the expert who carried out the tests and inspections;

4. The capacity of the receptacle and the maximum permissible load;
5. The wording "Do not open during carriage. Liable to spontaneous combustion.

A package must not weigh more than 400 kg.

- 206** (1) Substances of item 4 shall be packed in bags and placed in drums made of impermeable fibreboard or in zinc-sheet or aluminium-sheet receptacles. The walls of metal receptacles shall be lined with fibreboard. The bottoms and lids of fibreboard drums and metal receptacles shall be lined with wood.

(2) Metal receptacles must be fitted with closures or safety devices which vent when the internal pressure reaches a value not greater than 3 kg/cm<sup>2</sup>; the presence of these closures or safety devices must neither impair the strength of the receptacle nor impair its closure.

(3) A package must not weigh more than 75 kg.

- 207** (1) Substances of item 5 (a) shall be tightly compressed and shall be placed in leakproof metal receptacles.

(2) Substances of item 5 (b) and (c) shall be tightly compressed and shall be packed either in wooden or fibreboard cases or in paper wrappings or textile wrappings, firmly secured.

(3) Substances of item 5 may also be carried in bulk in conformity with marg. 217 and marg. 219 (3).

- 208** (1) Substances of item 6 (a) shall be packed in tightly closing leakproof receptacles, made of wood or metal. However, zirconium must be enclosed only in receptacles made of metal or glass, which shall be secured by cushioning material in strong wooden cases; if the cushioning material is inflammable, it shall be made fire-resistant.

Dust from blast furnace filters may also be carried in bulk in conformity with marg. 217 and 219 (3).

(2) Substances of item 6 (b) shall be enclosed in tightly closing leakproof iron drums or in wooden cases with a sheet-metal lining which has been made leakproof, for instance by soldering, or in tightly closing boxes made of tinsplate or thin aluminium sheet; these drums, cases or boxes shall be placed in wooden cases.

For substances of item 6 (b) handed over individually for carriage in tinsplate or aluminium-sheet boxes, a wrapping of corrugated fibreboard instead of a wooden case may be used. A package of this nature must not weigh more than 12 kg.

(3) Substances of item 6 (c) shall be packed in air-tight sheet-metal receptacles or in air-tight iron drums. In the case of sheet-metal receptacles, a package must not weigh more than 50 kg.

(4) Substances of item 6 (d) shall be packed in gas-tight receptacles made of metal, glass or a suitable plastics material. The stoppers used for closure shall be held in place by an additional device (such as a cap, crown, seal or binding) capable of preventing any loosening during carriage. Substances shall be despatched under a protective liquid (such as methanol) or a protective gas.

Metal receptacles shall be placed in a wooden packing case. A package must not weigh more than 50 kg.

Glass receptacles shall be secured by cushioning material in fibreboard or metal packagings; the cushioning material must be incombustible. Receptacles made of a plastics material shall be packed in fibreboard or metal packagings.

Packagings containing receptacles made of glass or plastics materials shall be placed in a wooden packing case. A package must not weigh more than 25 kg.

209 Substances of items 7 to 10 and 12 shall be enclosed in tightly closing packagings. Wooden packagings used for substances of items 7 and 8 shall be fitted with a leakproof lining.

210 The substance having been used for purifying lighting gas (spent oxide of iron) (item 11) shall be packed in tightly closing sheet-metal receptacles.

211 Empty sodium nitrate bags (item 13) shall be made up into tightly packed bundles securely fastened with string and placed either in wooden cases, or in a wrapping consisting of several thicknesses of strong paper or waterproofed fabric.

### 3. *Mixed packing*

212 (1) Substances grouped under the same item may be packed together in the same package. The inner packagings shall conform to the requirements prescribed for each substance, and the outer packaging shall be that laid down for the substances of the item in question.

(2) If smaller quantities are not prescribed in the section "Packing of individual substances", and if special conditions are not set out below, the substances of this Class, in quantities not exceeding 6 kg in the case of solid substances or 3 litres in the case of liquid substances for the total amount of substances listed under the same item or the same letter, may be placed together in the same package either with substances of another item or another letter of the same Class or with substances or articles belonging to other Classes—as long as mixed packing is also permitted for these—or with other goods.

Inner packagings must comply with the general and special packaging conditions. In addition, the general regulations of marg. 4 (6) and (8) must be observed.

A package must not weigh more than 150 kg, or more than 75 kg if it contains fragile receptacles.

#### *Special conditions:*

Item	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
1 2 3	Phosphorus, white or yellow Phosphides Zinc alkyls, etc.	Mixed packing not permitted		
6 (a), (b) and (d)	Dust and powder of aluminium or zinc Dust, powder and fine shavings of magnesium Metals in a pyrophoric form	3 kg	3 kg	Must not be packed together with weakly nitrated nitrocellulose and red phosphorus of Class III b or with bifluorides.
4, 5, 6 (c), 7 to 12	All substances			

4. *Marking and danger labels on packages* (see Appendix IX).

213 (1) Every package containing substances of items 1 to 4 and 6 shall bear a label conforming to model No. 2.

(2) Drums containing phosphorus (item 1) and having a screw-cap lid—unless they are fitted with a device maintaining them upright—shall bear in addition, high up in two diametrically opposite places, two labels conforming to model No. 8.

(3) Packages containing fragile receptacles not visible from the outside shall bear a label conforming to model No. 9. If the fragile receptacles contain liquids, the packages shall in addition, except in the case of sealed ampoules, bear labels conforming to model No. 8; these labels shall be affixed high up on two opposite sides of cases or in an equivalent manner when other packagings are used.

(4) In the case of consignments forwarded as a full wagon load, label No. 2, as prescribed under (1), need not be affixed to the packages (see also marg. 220).

B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

214 Substances of item 3 may not be carried by *grande vitesse* in less than full wagon loads unless in packages of not more than 25 kg.

C. PARTICULARS IN THE CONSIGNMENT NOTE

215 The description of the goods in the consignment note must conform to one of the names printed in *italics* in marg. 201. Where the name of the substance is not indicated in the case of items 2, 3, 9 and 10, the trade name must be used. The description of the goods must be *underlined in red* and followed by *particulars of the Class, the item number (together with the letter, if any), and the initials "RID" [e.g. II, item 5 (a), RID]*.

D. TRANSPORT EQUIPMENT

1. *Conditions relating to wagons and their loading*

a. *For packages*

216 (a) Packages containing substances of item 3 shall be loaded in open wagons. Packages weighing not more than 25 kg may also be loaded in covered wagons;

(b) Packages containing substances of item 4 shall be loaded in covered wagons;

(c) Packages containing substances of item 10 shall be loaded in covered wagons or sheeted open wagons.

b. *For carriage in bulk*

217 Substances of item 5 in bulk, and dust from blast-furnace filters [item 6 (a)] in bulk, shall be loaded in steel wagons with detachable covers; dust from blast-furnace filters, in bulk, may also be loaded in sheeted open steel wagons.

c. *For tank wagons*

218 (1) The only substance whose carriage in tank wagons is permissible is phosphorus of item 1.

(2) For the protection of phosphorus during carriage, recourse shall be had to one of the following two procedures:

(a) Use of water as a protective agent. In this case the phosphorus shall be covered with a sufficient quantity of water to form a layer at least 12 cm thick above the phosphorus. The empty space not occupied by liquid must, at a temperature of 60° C, be equal to at least 2% of the volume of the tank;



(b) Use of nitrogen as a protective agent. In this case the tank must be filled to not more than 96% of its capacity with phosphorus at a temperature of at least 60° C. The remaining space shall be filled with nitrogen in such a manner that the pressure never falls below the atmospheric pressure, even after cooling. The receptacle shall be closed in gas-tight fashion.

(3) Tank wagons for the carriage of phosphorus must satisfy the following conditions:

(a) The heating apparatus must not penetrate into the body of the tank, but be outside it. Other pipes must enter the upper part of the tank; openings must be situated above the level of the phosphorus and be able to be completely enclosed by covers capable of being bolted.

(b) The tank shall be made of steel, with walls not less than 10 mm thick at any point.

(c) Before being put into service, the tank must have successfully undergone a hydraulic-pressure test at a pressure of at least 4.5 kg/cm<sup>2</sup>.

(d) The tank shall have an internal gauging system for verifying the level of the phosphorus and, if water is used as the protective agent, a fixed measuring mark indicating the maximum level of the water.

d. *For small containers*

219 (1) Packages containing substances set out in this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 221 must be applied to the contents of a small container.

(3) Substances of item 5 and dust from blast-furnace filters [item 6 (a)] may also be carried without inner packaging in small containers of the closed type with complete walls.

2. *Marking and danger labels on wagons and on small containers (see Appendix IX)*

220 (1) Wagons in which substances of items 1 to 4 and 6 are loaded shall bear on both sides labels conforming to model No. 2.

Tank wagons containing substances of item 1 shall also bear on both sides labels conforming to model No. 2.

(2) Small containers in which substances of items 1 to 4 and 6 are loaded shall bear a label conforming to model No. 2.

Small containers enclosing packages bearing a label conforming to model No. 9 shall also bear this label.

(3) In addition, wagons in which substances of item 3 are loaded shall bear on both sides labels conforming to model No. 10.

E. PROHIBITIONS ON MIXED LOADING

221 (1) Substances of Class II must not be loaded in the same wagon together:

(a) With substances and articles of Class I a (marg. 21);

(b) With substances of Class IV b (marg. 451);

(c) With substances of Class VII (marg. 70I).

(2) Substances of items 3, 4 and 11 and substances of other items of Class II, if their outer packaging does not consist of metal receptacles, must not be loaded in the same wagon together:

(a) With articles of Class I b (marg. 61);

(b) With substances of Class III c (marg. 371);

(c) With substances of Class V, items 2 (a) and 3 (a) (marg. 501);

(3) Substances of item 4 must not be loaded in the same wagon together with articles of Class I c (marg. 101).

222 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon [art. 6, para. 10 (d), of CIM].

#### F. EMPTY PACKAGINGS

223 (1) The receptacles of items 14 and 15 must be closed in the same manner and leakproof in the same degree as though they were full [for receptacles of tank wagons, see under (2)].

(2) Receptacles of tank wagons which have contained phosphorus of item 1 shall at the time they are handed over for carriage:

Either be filled with nitrogen; the sender must certify in the consignment note that the tank, after closure, is gas-tight;

Or be filled with water to 96% at least and 98% at most of their capacity; between 1 October and 31 March this water must contain one or more anti-freezing agents, free from corrosive action and not liable to react with phosphorus, sufficiently concentrated to make it impossible for the water to freeze during carriage.

(3) The description in the consignment note must read: "*Empty receptacle II, item 14 (or 15), RID.*" This description must be *underline in red*.

#### G. OTHER REGULATIONS

224 Receptacles containing substances of item 3 and damaged during the journey shall be unloaded immediately and, if repairs cannot be carried out speedily, they may be sold with their contents, without other formalities, for the account of the sender.

225-299

### CLASS III a. INFLAMMABLE LIQUIDS

#### 1. List of substances

300 (1) Among the inflammable liquids and mixtures thereof, whether liquid or still pasty at a temperature not exceeding 15° C, the substances listed in marg. 301 are subject to the conditions set out in marg. 300 (2) to 318 and are consequently substances of RID.

(2) With the exception of those listed in other Classes, for the purposes of RID inflammable liquids are considered to be those which at a temperature of 50° C have a vapour pressure of not more than 3 kg/cm<sup>2</sup>.

(3) Liquids of Class III a which are liable to form peroxides easily (such as occurs with ethers or with certain heterocyclic oxygenated bodies) are not to be handed over for carriage unless their peroxide content, reckoned as hydrogen peroxide H<sub>2</sub>O<sub>2</sub>, does not exceed 0.3%.

(4) Substances of Class III a which polymerise easily are not to be accepted for carriage unless the necessary steps have been taken to prevent their polymerisation during carriage.

(5) The peroxide content referred to above and the flash-point referred to below shall be determined as shown in Appendix III (marg. 1300 to 1303).

(6) Solid substances soluble in liquids shall be deemed to include driers, fixed oils (boiled or blown linseed oils, etc.) or similar substances (with the exception of nitrocellulose) whose flash-point is above 100° C.

- 301 1. (a) Liquids not miscible, or only partially miscible, with water which have a flash-point below 21° C, also when they contain not more than 30% solid substances, nitrocellulose excepted, either dissolved or held in suspension in the liquids, or both, e.g.:

*Crude petroleum* and other *crude oils*, volatile products from the distillation of petroleum and other crude oils, coal, lignite, shale, wood and peat tars, e.g. *petroleum ether*, *pentanes*, *petrol*, *benzene* and *toluene*; *natural gas condensates*; *ethyl acetate (acetic ester)*, *vinyl acetate*, *diethyl ether (ethyl ether, sulphuric ether)*, *methyl formate* and others *ethers* and *esters*; *carbon disulphide*; *acrylaldehyde (acrolein)*; certain *chlorinated hydrocarbons* [e.g. *1,2-dichloroethane* and *chloroprene (chlorobutadiene)*];

- (b) Mixtures of liquids having a flash-point below 21° C and containing more than 55% nitrocellulose with a nitrogen content not exceeding 12.6% (*collodions*, *semi-collodions* and other *nitrocellulose solutions*).

For (a), see also marg. 301 a under (a), (b) and (d); for (b), see also marg. 301 a under (a)

NOTE. As regards mixtures of liquids having a flash-point below 21° C,

—With more than 55% nitrocellulose, whatever its nitrogen content; or

—With not more than 55% nitrocellulose with a nitrogen content above 12.6%, see Class I a, marg. 21, item 1, and Class III b, marg. 331, item 7 (a).

2. Liquids not miscible, or only partially miscible, with water which have a flash-point below 21° C and contain more than 30% solid substances, nitrocellulose excepted, either dissolved or held in suspension in the liquids, or both, e.g.:

Certain *colours for rotogravures* and *for leathers*, certain *varnishes*, certain *enamel paints* and *rubber solutions*. See also marg. 301 a under (c).

3. Liquids not miscible, or only partially miscible, with water which have a flash-point between 21° C and 55° C inclusive, also when they contain not more than 30% solid substances either dissolved or held in suspension in the liquids, or both, e.g.:

*Turpentine*; semi-heavy products from the distillation of petroleum and other crude oils, coal, lignite, shale, wood and peat tar, e.g. *white spirit (turpentine substitute)*, *heavy benzols*, *petroleum oils* (for lighting, heating or motors), *xylene*, *styrene*, *cumene*, *solvent naphtha*; *butanol*; *butyl acetate*; *pentyl acetate (amyl acetate)*; *nitromethane* and certain *mononitro-paraffins*; certain *chlorinated hydrocarbons* (e.g. *chlorobenzene*, *monochlorobenzene*). See also marg. 301 a under (c) and (d).

4. Liquids not miscible, or only partially miscible, with water which have a flash-point above 55° C but not exceeding 100° C, also when they contain not more than 30% solid substances either dissolved or held in suspension in the liquids, or both, e.g.:

Certain *tars* and their distillation products; *heating oils*, *diesel oils*, certain *gas oils*; *tetrahydronaphthalene (tetralin)*; *nitrobenzene*; certain *chlorinated hydrocarbons* (e.g. *2-ethylhexyl chloride*). See also marg. 301 a under (c) and (d).

5. Liquids miscible in all proportions with water which have a flash-point below 21° C, also when they contain not more than 30% solid substances either dissolved or held in suspension in the liquids, or both, e.g.:

*Methanol (methyl alcohol, wood spirit)* denatured or not; *ethanol (ethyl alcohol, ordinary alcohol)*, denatured or not; *acetaldehyde*; *acetone* and *acetone mixtures*; *pyridine*. See also marg. 301 a under (a) and (c).

6. *Empty receptacles*, uncleaned including receptacles of tank wagons and small tank containers, which have contained inflammable liquids of Class III a.

301a

Substances handed over for carriage in conformity with the following provisions are not subject to the regulations of chapter 2 "Conditions of carriage":

- (a) Liquids of item 1, except those referred to in (b) below, and acetone and acetone mixtures (item 5): in quantities of not more than 200 g per receptacle, in receptacles made of sheet metal, glass, porcelain, stoneware or a suitable plastics material with a total content of not more than 1 kg being placed together in an outer packaging made of sheet metal, wood or fibreboard and fragile receptacles being suitably secured in the packaging to avoid breakage;
- (b) Carbon disulphide, diethyl ether, petroleum ether, pentanes, methyl formate: in quantities of 50 g per receptacle and 250 g per package, these substances being packed in the same way as those in (a);
- (c) Liquids of items 2 to 5, except acetaldehyde, acetone and acetone mixtures: in quantities of 1 kg per receptacle and 10 kg per package, these substances being packed in the same way as those in (a);
- (d) The fuel contained in the tanks of motor-driven vehicles or in closed auxiliary tanks firmly fixed to the vehicles. If there is a cock between the tank and the engine it must be closed; the electric circuit must also be disconnected. Motor cycles and motor-assisted pedal cycles whose tanks contain fuel must be loaded upright on their wheels and secured against falling.

## 2. Conditions of carriage

(The regulations relating to empty receptacles are to be found under F.)

### A. PACKAGES

#### 1. General conditions for packing

302

(1) Receptacles shall be so closed and leakproof as to prevent any loss of the contents, and particularly any evaporation. For the special regulations relating to the receptacles of tank wagons, see marg. 311 (3).

(2) The materials of which the receptacles and their closures are made must not be liable to attack by the contents or form harmful or dangerous compounds therewith.

(3) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. In particular, receptacles and their closures must, unless the section headed "Packing of individual substances" provides otherwise, be able to withstand any pressure which, the presence of air also being taken into account, may arise inside the receptacles in normal carriage. For this purpose a free space must be left, account being taken of the difference between the temperature of the substances at the time of filling and the highest mean temperature which they are likely to reach during carriage [see also marg. 305 and 311 (6), (7) and (8)]. Inner packagings shall be firmly secured in outer packagings. Unless otherwise specified in the section "Packing of individual substances", inner packagings may be enclosed in outer packagings, either singly or in groups.

(4) Bottles and other glass receptacles must be free from faults of a nature liable to impair their strength; in particular, internal stresses must have been suitably relieved. The thickness of the walls must be not less than 3 mm in the case of receptacles which, with their contents, weigh more than 35 kg, and not less than 2mm in the case of other receptacles.

The tightness of the closure system must be ensured by an additional device (cap, crown, seal, binding, etc.) capable of preventing any loosening of the closure system during carriage.

(5) Cushioning material shall be suited to the nature of the contents; in particular, it shall be absorbent. Suitable materials must be used to secure receptacles in the protective packaging; the securing must be carried out with care and checked periodically (if necessary, before each fresh filling of the receptacles).

## 2. *Packing of individual substances*

303

(1) Substances of items 1 to 5 must be packed in suitable receptacles made of metal or of glass, porcelain, stoneware or similar materials. Substance of item 4 and corrosive liquids of items 1 (a), 3 and 5 may also be packed in receptacles made of a suitable plastics material. [For the special regulations concerning chloroprene and nitromethane, see under (8) and (9) respectively.]

(2) Fragile receptacles (glass, porcelain, stoneware or similar materials) may contain for substances of item 1 at the most:

Carbon disulphide .....	1 litre,
Diethyl ether, petroleum ether, pentanes .....	2 litres,
Other substances of item 1 .....	5 litres.

(3) Receptacles made of tinsplate with a capacity not exceeding 10 litres must have a wall thickness of at least 0.25 mm; those with a capacity of more than 10 litres but not exceeding 60 litres must have a wall thickness of at least 0.30 mm, and their joints shall be double-seamed by welting, or soldered, or manufactured by a process ensuring a similar degree of strength and leak-proofness.

(4) Receptacles made of sheet steel [for tinsplate receptacles with a capacity not exceeding 60 litres, see also (3)] must be welded or hard-soldered and, depending on the thickness of their walls, they may contain the following quantities of substances of items 1 to 5:

- If the wall thickness is at least 0.5 mm, not more than 30 litres,
- If the wall thickness is at least 0.7 mm, not more than 60 litres,
- If the wall thickness is at least 1.5 mm, over 60 litres.

Packages weighing more than 100 kg shall be fitted with rolling hoops.

(5) Receptacles made of other metal sheet must be designed and manufactured in such a way that they possess the same strength as the sheet-steel receptacles referred to under (4).

(6) Liquids whose vapour pressure at 50° C does not exceed 1.5 kg/cm<sup>2</sup>—with the exception of carbon disulphide—may also be carried in metal drums complying with the following provisions:

The body joints of the drums must be welded and the end joints welded or double-seamed by welting. The drums must be fitted with rolling hoops or reinforcing ribs. When immersed in water, they must remain leakproof at a pressure of not less than 0.2 kg/cm<sup>2</sup>. They must be of a type of construction which has withstood tests carried out by an approved body in conformity with Appendix V, marg. 1500-1503, and must bear the mark given at the time of the test.

(7) For the carriage in one-trip metal packagings (new packagings intended to be used only once) of inflammable products whose vapour pressure at 50° C does not exceed 1.1 kg/cm<sup>2</sup> it is not necessary, in the case of a package whose unit weight must not exceed 225 kg, for the end of the receptacle to be welded to the body and for the wall thickness to be greater than 1.25 mm, but the receptacle must be able to withstand, without leakage, a hydraulic pressure of not less than 0.3 kg/cm<sup>2</sup>, and its body and ends must be equipped with devices (such as ribs or rolling hoops), whether detachable or not, ensuring rigidity.

(8) Chloroprene [item 1 (a)] shall be packed:

- (a) In hermetically closed metal receptacles with a capacity not exceeding 15 litres and having, if necessary, a suitable inner lining. These receptacles shall be secured by absorbent cushioning material in a wooden case or in another outer packaging of sufficient strength; or
- (b) In sheet-steel canisters, welded or hard-soldered, with a capacity not exceeding 60 litres, hermetically closed and fitted with means of handling.

(9) Nitromethane (item 3) must be contained:

- (a) In fragile receptacles containing not more than 1 litre; or
- (b) In sheet-steel receptacles in accordance with (4) above, with a capacity not exceeding 10 litres; or
- (c) In metal drums with a capacity not exceeding 200 litres, having two hermetic closures, one of them screw-threaded, and fitted with rolling hoops.

(10) For carriage in tank wagons and small tank containers, see marg. 311 and 312 (3).

304

(1) Fragile receptacles containing substances of items 1 to 5, receptacles made of a suitable plastics material containing corrosive liquids of items 1 (a), 3 and 5, tinplate receptacles containing substances of items 1 and 5, tinplate receptacles whose wall thickness is less than 0.5 mm containing substances of items 2 to 4 and sheet-steel receptacles containing nitromethane in accordance with marg. 303 (9) (b), shall be secured by cushioning material in protective packagings. If receptacles made of a plastics material are secured individually in protective packagings, cushioning materials are not necessary.

Protective packagings enclosing fragile receptacles which contain substances of items 1 and 5 and protective packagings enclosing receptacles which contain nitromethane (item 3) must have complete walls and be made of wood, sheet metal or a similar material.

The closures of fragile receptacles placed in open protective packagings must be provided with a protective cover which secures them against damage. If the packages are to be loaded in an open wagon (see marg. 310 (1)), the protective cover must be incapable of igniting on contact with a flame.

(2) The following may be despatched without a protective packaging:

- (a) Receptacles made of a plastics material containing substances of item 4,
- (b) Receptacles made of tinplate not less than 0.5 mm thick, containing substances of items 2 to 4,
- (c) Sheet-metal receptacles in accordance with marg. 303 (4) to (7),
- (d) Metal canisters in accordance with marg. 303 (8) (b), containing chloroprene [item 1 (a)],
- (e) Metal drums in accordance with marg. 303 (9) (c), containing nitromethane [item 3].

(3) The following packages must not exceed the maximum weights shown below:

- (a) Packages of fragile receptacles containing substances of item 1 . . . . 30 kg,
- (b) Packages of fragile receptacles containing substances of items 2 to 5 . . . 75 kg,
- (c) Packages of receptacles made of a plastics material containing substances of items 1 (a) and 3 to 5 and of tinplate receptacles containing substances of items 1 to 5 . . . . . 75 kg,
- (d) Packages of receptacles containing chloroprene in accordance with marg. 303 (8) . . . . . 75 kg,
- (e) Packages of receptacles made of sheet steel containing nitromethane in accordance with marg. 303 (9) (b) . . . . . 75 kg,
- (f) Drums tested in accordance with marg. 303 (6) . . . . . 250 kg,
- (g) Receptacles in accordance with marg. 303 (7) . . . . . 225 kg,
- (h) Drums containing nitromethane in accordance with marg. 303 (9) (c) . . 275 kg.

(4) With the exception of cases and metal drums, packages must be fitted with means of handling.

305

(1) Metal receptacles shall not be filled beyond 93% of their capacity with liquids of item 1, with nitromethane (item 3) or with acetaldehyde, acetone or acetone mixtures (item 5). However, receptacles containing hydrocarbons other than petroleum ether, pentanes, benzol and toluene may be filled to 95% of their capacity.

(2) For carriage in tank wagons and small tank containers, see marg. 311 and 312 (3).

### 3. *Mixed packing*

306

(1) Substances grouped under the same item may be packed together in the same package. The inner packagings shall conform to the requirements prescribed for each substance, and the outer packaging shall be that laid down for the substances of the item in question.

(2) If smaller quantities are not prescribed in the section "Packing of individual substances", the substances of this Class may be placed together in the same package either with substances or articles belonging to other Classes—as long as mixed packing is also permitted for them—or with other goods as indicated below.

Item	Description of substance	Maximum quantity			Special regulations
		Per fragile receptacle	Per non-fragile receptacle	Per package	
1 (a)	Carbon disulphide	0.31	11	11	Liquids of Class III a must not be packed together with substances of Class II, hydrogen peroxide and perchloric acid of Class III c and the substances of Class V, items 2 (a), 3 (a), 4, 7 and 41.
1 (a) and 1 (b)	All substances except carbon disulphide	11	51	51	
2	All substances	11	51	101	
3	All substances	31	51	101	
4	All substances	51	51	101	
5	Liquids with a boiling point $\leq 50^{\circ}$ C	11	51	51	
	Other substances	31	51	101	

Inner packagings must comply with the general and special packaging conditions. In addition, the general regulations of marg. 4 (6) and 8 must be observed.

A package must not weigh more than 150 kg, or more than 75 kg if it contains fragile receptacles.

4. *Marking and danger labels on packages* (see Appendix IX).

307 (1) Every package containing liquids of items 1 and 2, or acetaldehyde, acetone or acetone mixtures (item 5), shall bear a label conforming to model No. 2. In addition, every package containing acrylaldehyde or chloroprene (chlorobutadiene) [item 1 (a)] shall bear a label conforming to model No. 4.

(2) Packages containing methanol (item 5) shall bear a label conforming to model No. 4.

(3) Packages containing fragile receptacles not visible from the outside shall bear a label conforming to model No. 9. If the fragile receptacles contain liquids, the packages shall in addition, except in the case of sealed ampoules, bear labels conforming to model No. 8; these labels shall be affixed high up on two opposite sides of cases or in an equivalent manner when other packagings are used.

(4) In the case of consignments forwarded as a full wagon load, labels Nos. 2 and 4, as prescribed under (1) and (2), need not be affixed to the packages (see also marg. 313).

B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

308 Liquids of items 1, 2 and 3, and acetaldehyde, acetone and acetone mixtures (item 5), may not be forwarded by *grande vitesse* otherwise than in full wagon loads, with the exception of consignments which, in conformity with marg. 310 (2), may be loaded in covered wagons.

C. PARTICULARS IN THE CONSIGNMENT NOTE

309 (1) The description of the goods in the consignment note must conform to one of the names printed in *italics* in marg. 301. If this does not contain the name of the substance, the trade name must be used. The description of the goods must be *underlined in red* and followed by *particulars of the Class, the item number (together with the letter, if any), initials "RID"* [e.g. *III a, item I (a), RID*].

(2) In the case of *grande vitesse* consignments packed in conformity with marg. 310 (2) and containing liquids of items 1, 2 and 3 or acetaldehyde, acetone or acetone mixtures (item 5), the sender must certify as follows in the consignment note: "*Grande vitesse packaging*".

(3) In the case of consignments of substances which polymerise easily, the sender must certify as follows in the consignment note: "*The necessary steps have been taken to prevent polymerisation during carriage*".

D. TRANSPORT EQUIPMENT

1. *Conditions relating to wagons and their loading*

a. *For packages*

310 (1) Packages containing liquids of items 1, 2 and 3, and acetaldehyde, acetone and acetone mixtures (item 5), shall be loaded in open wagons.



(2) The following may, however, be loaded in covered wagons regardless of the number of packages:

- (a) Liquids of item 1 if enclosed in receptacles made of glass, porcelain, stone-ware or similar materials, or of a plastics material, and packed as prescribed in marg. 303 and 304;
- (b) Liquids of item 1, if contained in metal receptacles:

Maximum weight  
of packages

Petroleum ether; pentanes; natural gas condensates; diethyl ether (ethyl ether, sulphuric ether), also if mixed with other liquids of item 1 (a); carbon disulphide [item 1 (a)] . . . . . 40 kg,

Other liquids of item 1 (a) and (b) . . . . . 75 kg;

- (c) Packages containing liquids of items 2 and 3, acetaldehyde, acetone or acetone mixtures (item 5), if not weighing more than 100 kg. However, these packages may weigh as much as:

250 kg if they are in the form of drums as referred to in marg. 303 (6),

225 kg if they are in the form of drums as referred to in marg. 303 (7),

500 kg if they are in the form of sheet-steel drums with a wall thickness of not less than 1.5 mm and fitted with rolling hoops, as referred to in marg. 303 (4), or other drums of the same strength and leakproofness, as referred to in marg. 303 (5);

- (d) Collective packagings weighing not more than 100 kg each and containing receptacles which, under (a), (b) or (c) above, may be loaded in covered wagons.

(3) As regards the use of electrically fitted wagons for the carriage of liquids of items 1, 2 and 3 and acetaldehyde, acetone or acetone mixtures (item 5), in packages of more than 50 kg, see Appendix IV.

b. *For tank wagons*

311

(1) All liquids of Class III a, with the exception of nitromethane (item 3), may be carried in tank wagons.

(2) Receptacles shall be made of sheet steel or other sheet metal and shall be electrically earthed. They, and their closures, shall be in conformity with the general conditions for packing in marg. 302 (2) and (3), first sentence. Removable receptacles\* shall be fixed on the underframe of the wagon so that they cannot shift.

(3) For carriage in tank wagons of the liquids of items 1 to 3 and 5, only the receptacles referred to in (a), (b) and (c) following are to be allowed:

(a) Receptacles equipped with venting devices fitted with a frame-trap and constructed so that they cannot be hermetically sealed and do not allow the liquid to escape as a result of jolting during carriage;

(b) Receptacles equipped with venting devices fitted with a flame-trap and closed by a safety valve opening automatically under an internal pressure of 1.5 kg/cm<sup>2</sup>;

(c) Receptacles with hermetic closure satisfying the conditions of marg. 133 (1), 141 (1) and (2) (b). The following particulars must be engraved either on the

\* The term "removable receptacle" means a receptacle which, while constructed to fit the special apparatus of the wagon, can, however, be removed from it only after the means of attachment have been dismantled.

tanks themselves, without affecting their strength, or on a rustless metal plate welded to the receptacles:

The name or mark of the maker and the number of the receptacle;

The test pressure, the date (month, year) of the last test and the stamp of the expert who carried out the test;

The capacity of the receptacle ascertained as set out in marg. 159 (2) (a) 9. On the plate of the wagon the following should be given:

The name of the owner,

The capacity of the receptacle,

The tare of the receptacle (in the case of removable receptacles),

The name of the product in full.

(4) Receptacles which may be used are:

- (a) For liquids whose vapour pressure at 50° C does not exceed 1.1 kg/cm<sup>2</sup>, the receptacles laid down under (3) (a), (b) and (c);
- (b) For liquids whose vapour pressure at 50° C exceeds 1.1 kg/cm<sup>2</sup> but does not exceed 1.75 kg/cm<sup>2</sup>, the receptacles laid down under (3) (b) and (c);
- (c) For liquids whose vapour pressure at 50° C exceeds 1.75 kg/cm<sup>2</sup>, the receptacles laid down under (3) (c).

NOTE. For petroleum products the vapour pressure may also be determined according to the Reid method in I P 69 or ASTM D-323. The following are then to be used:

Instead of a vapour pressure of 1.1 kg/cm<sup>2</sup> at 50° C, a vapour pressure according to Reid of 0.6 kg/cm<sup>2</sup> at 37.8° C and

Instead of a vapour pressure of 1.75 kg/cm<sup>2</sup> at 50° C, a vapour pressure according to Reid of 1.0 kg/cm<sup>2</sup> at 37.8° C.

(5) Before being put into service and thereafter periodically, the receptacles indicated under (3) must be subjected to a test under the supervision of an expert approved by the competent authority.

For the hydraulic-pressure test of receptacles indicated under (3) (a) and (b), the pressure to be applied must be 1.5 kg/cm<sup>2</sup> at least and for receptacles indicated under (3) (c) it shall be:

- (a) 3 kg/cm<sup>2</sup> when they are intended for the carriage of liquids having a vapour pressure which does not exceed 1.75 kg/cm<sup>2</sup> at 50° C;
- (b) 4 kg/cm<sup>2</sup> when they are intended for the carriage of liquids having a vapour pressure of more than 1.75 kg/cm<sup>2</sup> at 50° C.

The hydraulic-pressure test and an internal inspection shall be carried out at least once every six years.

At the periodic inspection, but only in the case of the receptacles indicated under (3) (a), a leakage test may replace the hydraulic-pressure test. The leakage test shall be conducted at a pressure of 0.3 kg/cm<sup>2</sup>.

(6) The degrees of filling shown below may not be exceeded for the receptacles indicated under (3) (a) and (b):

For certain petrols and other liquids which have a coefficient of cubical expansion of  $60 \times 10^{-5}$  up to  $90 \times 10^{-5}$  . . . . . 97% of the capacity,

For toluene, xylene, ethanol, propan-1-ol, butan-1-ol, pentan-1-ol, petroleum, certain petrols and other liquids having a coefficient of cubical expansion of more than  $90 \times 10^{-5}$  up to  $120 \times 10^{-5}$  . . . . . 96% of the capacity,

- For carbon disulphide, hexane, heptane, octane, benzol, methanol, certain petrols and other liquids having a coefficient of cubical expansion of more than  $120 \times 10^{-5}$  up to  $150 \times 10^{-5}$  ..... 95% of the capacity,
- For diethyl ether, pentane, acetone, certain petrols and other liquids having a coefficient of cubical expansion of more than  $150 \times 10^{-5}$  up to  $180 \times 10^{-5}$  ..... 94% of the capacity.

The degrees of filling specified are valid also for the receptacles indicated under (3) (c), if they are filled with liquids having at 50° C a vapour pressure of not more than 1.75 kg/cm<sup>2</sup> [see under (5) (a)].

(7) The degrees of filling shown below may not be exceeded for liquids having at 50° C a vapour pressure of more than 1.75 kg/cm<sup>2</sup> for the receptacles indicated under (3) (c):

- For methyl formate and other liquids having a coefficient of cubical expansion of more than  $150 \times 10^{-5}$  up to  $180 \times 10^{-5}$  ..... 91% of the capacity,
- For acetaldehyde and other liquids having a coefficient of cubical expansion of more than  $180 \times 10^{-5}$  up to  $230 \times 10^{-5}$  ..... 90% of the capacity.

NOTE. The degree of filling is calculated according to the following formula:

(a) For liquids indicated in (6):

$$\text{Degree of filling} = \frac{100}{1 + 35 \alpha} \% \text{ of the capacity};$$

(b) For liquids indicated in (7):

$$\text{Degree of filling} = \frac{97}{1 + 35 \alpha} \% \text{ of the capacity.}$$

In these two formulae  $\alpha$  represents the mean coefficient of cubical expansion of the liquid between 15° and 50° C, that is, for a maximum difference of 35° C.

$\alpha$  is calculated according to the following formula:

$$\alpha = \frac{d_{15} - d_{50}}{35 \times d_{50}},$$

$d_{15}$  and  $d_{50}$  being the densities of the liquid at 15° and 50° C.

(8) Receptacles used for the carriage of substances of item 4 shall be filled to the extent that, even after expansion of the liquid due to an increase in the average temperature of the latter up to 50° C, they are not completely filled.

*c. For small containers*

312

(1) With the exception of fragile receptacles as specified in marg. 4 (5), packages containing substances set out in this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 314 must be applied to the contents of a small container.

(3) Substances of Class III a with the exception of carbon disulphide, chloroprene [item 1 (a)] and nitromethane (item 3) may also be carried in small tank containers. The regulations in marg. 305 as regards filling must be observed.

Tank containers must be able to withstand a test pressure of 2 kg/cm<sup>2</sup>; however, tank containers intended for the carriage of petroleum ether, pentanes, diethyl ether, methyl formate and acrylaldehyde of item 1, acetaldehyde, acetone and acetone mixtures of item 5 must withstand a test pressure of 4 kg/cm<sup>2</sup>. The pressure test must be repeated every six years. Tank containers must bear in clearly legible and indelible characters the test pressure, the date (month, year) of the last test and the stamp of the expert who carried out the test.

2. *Marking and danger labels on wagons and on small containers* (see Appendix IX)

313 (1) Wagons in which substances of items 1 and 2 and acetaldehyde, acetone and acetone mixtures (item 5), are loaded shall bear on both sides labels conforming to model No. 2. In addition, these wagons shall bear on both sides labels conforming to model No. 10. Tank wagons containing substances mentioned above shall also bear on both sides labels conforming to models Nos. 2 and 10. Wagons and tank wagons in which acrylaldehyde or chloroprene (chlorobutadiene) [item 1 (a)] are loaded shall, in addition, bear on both sides labels conforming to model No. 4.

(2) Wagons in which methanol (item 5) is loaded shall bear on both sides labels conforming to model No. 4.

(3) Small containers and small tank containers in which liquids of items 1 and 2, and acetaldehyde, acetone and acetone mixtures (item 5), are loaded shall bear a label conforming to model No. 2.

Small containers and small tank containers in which acrylaldehyde [item 1 (a)] and methanol (item 5) are loaded shall bear a label conforming to model No. 4.

Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

#### E. PROHIBITIONS ON MIXED LOADING

314 (1) Liquids of Class III a must not be loaded in the same wagon together:

- (a) With substances and articles of Class I a (marg. 21);
- (b) With articles of Class I b, items I (d), 3, 5, 10 and 11 (marg. 61);
- (c) With substances of Class III c (marg. 371);
- (d) With substances of Class IV a, item 5 (marg. 401);
- (e) With substances of Class V, items 2 (a) and 3 (a) (marg. 501);
- (f) With substances of Class VII (marg. 701).

(2) Liquids of items 1 and 2, and acetaldehyde, acetone and acetone mixtures (item 5), must not be loaded in the same wagon together with articles of Class I c, items 21, 22 and 23 (marg. 101).

(3) Liquids of items 1, 2 and 5 must not be loaded in the same wagon together with substances of Class IV b (marg. 451).

315 Separate consignment notes must be made out for consignments which may not be loaded in the same wagon [art. 6, para. 10 (d), of CIM].

#### F. EMPTY PACKAGINGS

316 (1) Receptacles of item 6 must be closed in the same manner and leak-proof in the same degree as though they were full.

(2) The description in the consignment note must read "*Empty receptacle III a, item 6, RID*". This description must be *underlined in red*.

(3) Receptacles of item 6 having contained methanol (item 5), handed over for carriage in less than full wagon loads, and tank wagons and small tank containers shall bear a label conforming to model No. 4 (see Appendix IX).

G. OTHER REGULATIONS

317 Receptacles containing liquids of items 1 and 2, or acetaldehyde, acetone or acetone mixtures (item 5), shall, if damaged during the journey, be unloaded immediately and, if repairs cannot be carried out speedily, they may be sold with their contents, without other formalities, for the account of the sender.

318 Receptacles of tank wagons already in service before 1 January 1965 which are not in conformity with the regulations of marg. 311 are to be accepted for international carriage until 31 December 1968. They may be filled with inflammable liquids to the degrees of filling laid down in marg. 311 (6) and (7).

319-329

CLASS III b. INFLAMMABLE SOLIDS

1. *List of substances*

330 Among the substances covered by the heading of Class III b, those listed in marg. 331 are subject to the conditions set out in marg. 331 to 355 and are consequently substances of RID.

331 1. Substances which can be easily ignited by sparks, e.g. *wood flour, sawdust, wood shavings, wood fibre, wood charcoal, wood parings and wood cellulose, old papers and waste paper, paper fibre, rushes* (except Spanish broom), *reeds, hay, straw*, also when damp (including *maize, rice and flax straw*), *textile materials* of vegetable origin and *waste products of textile materials* of vegetable origin, pulverised or granulated *cork* whether swollen or not, with or without admixtures of tar or other substances not liable to spontaneous oxidisation and *cork waste* in small pieces. See also Class II, marg. 201, items 8 to 10 and marg. 201 a, under (b).

NOTE. 1. Unfermented hay or hay liable to undergo fermentation is not to be accepted for carriage when still having a degree of humidity which might lead to fermentation.

2. Coverings and slabs of swollen cork, manufactured under pressure, with or without admixtures of tar or other substances not liable to spontaneous oxidisation, are not subject to the provisions of RID.

3. Cork impregnated with substances still liable to spontaneous oxidisation is a substance of Class II (see marg. 201, item 9).

4. Substances of item 1 used as packaging or filling materials are not considered substances of RID.

2. (a) *Sulphur* (including *flowers of sulphur*);

(b) *Sulphur in the molten state*.

3. *Celloidin* produced by incomplete evaporation of the alcohol contained in collodion and consisting mainly of collodion cotton.

4. *Celluloid* in slabs, sheets, rods or tubes, and *fabrics coated with nitro-cellulose*.

5. *Film celluloid*, i.e. the raw material for films, without emulsion, in rolls and developed *celluloid films*.

6. *Celluloid waste* and *celluloid-film waste*.

NOTE. Nitrocellulose film waste, free from gelatine, in reels, sheets or strips, is a substance of Class II (see marg. 201, item 4).

7. (a) Weakly nitrated *nitrocellulose* (such as *collodion cotton*), i.e. with a nitrogen content not exceeding 12.6% well stabilised and containing in addition at least 25% water or alcohol (methyl, ethyl, normal propyl or isopropyl, butyl and pentyl alcohol or mixtures thereof), also if denatured, solvent naphtha, benzol, toluene, xylene, mixtures of denatured alcohol and xylene, mixtures of water and alcohol, or alcohol containing camphor in solution;

NOTE. 1. Nitrocellulose with a nitrogen content exceeding 12.6% is a substance of Class 1 a (see marg. 21, item 1).

2. When the nitrocellulose is moistened by denatured alcohol, the denaturing substance must not have a harmful effect on the stability of the nitrocellulose.

- (b) Plasticised *nitrocellulose*, not pigmented, containing at least 18% plasticiser (such as dibutyl phthalate or a plasticiser at least equal in effect to dibutyl phthalate) whose nitrocellulose has a nitrogen content not exceeding 12.6%; the nitrocellulose may be in the form of chips;

NOTE. Plasticised nitrocellulose, not pigmented, containing at least 12% and less than 18% of dibutyl phthalate or of a plasticiser at least equal in effect to dibutyl phthalate is a substance of Class 1 a (see marg. 21, item 4).

- (c) Plasticised *nitrocellulose*, pigmented, containing at least 18% plasticiser (such as dibutyl phthalate or a plasticiser at least equal in effect to dibutyl phthalate) whose nitrocellulose has a nitrogen content not exceeding 12.6% and containing at least 40% nitrocellulose; the nitrocellulose may be in the form of chips.

NOTE. Plasticised nitrocellulose, pigmented, containing less than 40% nitrocellulose is not subject to the provisions of RID.

For (a), (b) and (c): nitrocellulose, weakly nitrated, and plasticised nitrocellulose, pigmented or not, are not to be accepted for carriage when they do not satisfy the conditions for stability and safety of Appendix I or the conditions set out above concerning the nature and quantity of the additional substances.

For (a), see also Appendix I, marg. 1101; for (b) and (c), see also Appendix I, marg. 1102, 1.

8. *Red phosphorus* (amorphous), *phosphorus sesquisulphide* and *phosphorus pentasulphide*.

NOTE. Phosphorus pentasulphide which contains either white or yellow phosphorus is not to be accepted for carriage.

9. *Ground rubber*, *rubber dust*.

10. *Dust of coal*, *lignite*, *lignite coke* and *peat*, artificially prepared (e.g. by pulverisation or other processes), and *coke from carbonised lignite* rendered inert (i.e. not liable to spontaneous combustion).

NOTE. 1. Natural dusts obtained as residues from the production of coal, coke, lignite or peat are not subject to the provisions of RID.

2. Coke from carbonised lignite which has not been rendered completely inert is not to be accepted for carriage.

11. (a) *Crude naphthalene* having a melting point below 75° C;  
(b) *Pure naphthalene* and *crude naphthalene*, having a melting point of 75° C or over;  
(c) *Naphthalene in its molten state*.

For (a) and (b), see also marg. 331 a.

- 331a Naphthalene in balls or flakes [item 11 (a) and (b)] is not subject to the regulations of chapter 2 "Conditions of carriage" if packed, not more than 1 kg per box, in tightly closed fibreboard or wooden boxes, and if these boxes, not more than 10 per case, are enclosed in wooden cases.

## 2. Conditions of carriage

### A. PACKAGES

#### 1. General conditions for packing

- 332 (1) Packagings shall be so closed and arranged as to prevent any loss of the contents.

(2) The materials of which the packagings and their closures are made must not be liable to attack by the contents or form harmful or dangerous compounds therewith.

(3) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. Solid substances shall be firmly secured in their packagings, and inner packagings shall be firmly secured in outer packagings. Unless otherwise specified in the section "Packing of individual substances", inner packagings may be enclosed in outer packagings, either singly or in groups.

(4) Cushioning material shall be suited to the nature of the contents; in particular, it shall be absorbent when the contents are liquid or might exude liquid.

#### 2. Packing of individual substances

- 333 (1) Substances of items 1 and 2 (a), when forwarded by *grande vitesse* in less than full wagon loads, shall be enclosed in wooden packagings; wood flow, sawdust, wood charcoal, pulverised or granulated cork, cork waste in small pieces (item 1) and sulphur of item 2 (a) may also be packed in strong bags made of paper or closely woven jute.

(2) Substances of item 1 and sulphur of item 2 (a) may also be carried in bulk in conformity with marg. 348 (1) and marg. 350 (3).

(3) Sulphur of item 2 (b) may not be carried otherwise than in tank wagons (see marg. 349).

- 334 Celloidin (item 3) shall be so packed as to prevent its drying.

- 335 (1) Celluloid in slabs, sheets, rods or tubes and fabrics coated with nitrocellulose (item 4) shall be enclosed:

(a) In firmly closed wooden packagings, or

(b) In a stout paper wrapping, which shall be placed

1. In crates; or

2. Between frames made of boards, the edges of the frames extending beyond the paper wrapping and the frames being bound with iron bands; or

3. In wrappings made of closely woven fabric.

(2) A package must not weigh more than:

75 kg in the case of celluloid in slabs, sheets or tubes and of fabrics coated with nitrocellulose and when the outside packaging is made of fabric in accordance with (1) (b) 3, above;

120 kg in all other cases.

- 336 (1) Film celluloid in rolls and developed celluloid films (item 5) shall be enclosed in wooden packagings or in fibreboard boxes.
- (2) Developed films, when forwarded by *grande vitesse* in less than full wagon loads, shall be packed in boxes made of wood, tinplate or thin aluminium sheet, or in hardened fibreboard, and then placed in wooden cases with complete walls.
- (3) For the particulars in the consignment note, see marg. 346 (2).
- 337 (1) Celluloid waste and celluloid-film waste (item 6) shall be enclosed in wooden packagings or in two strong bags made of closely woven jute, fire-proofed so as not to ignite even on contact with a flame, with strong seams and continuous. These bags shall be placed one inside the other; after filling, their openings shall be separately and several times folded over or tightly stitched so as to prevent any escape of the contents. However, celluloid waste may be packed simply in bags made of closely woven rough canvas or jute provided it is first wrapped in stout packing paper or in a suitable plastics material and the sender certifies that the celluloid waste does not contain any waste in dust form; in the case of *grande vitesse* consignments in less than full wagon loads, only wooden packagings are to be accepted.
- (2) Packages whose packaging consists of rough canvas or jute must not weigh more than 40 kg in single packaging and not more than 80 kg in double packaging.
- (3) For the particulars in the consignment note, see marg. 346 (3).
- 338 (1) Substances of item 7 (a) shall be packed:
- (a) In wooden receptacles or in drums made of waterproof fibreboard; these receptacles and drums shall be fitted with a lining impervious to the liquids contained therein; their closures must be leakproof; or
- (b) In bags which are impervious to the vapours from the liquids contained therein (e.g. made of rubber or of a suitable plastics material not readily inflammable), placed in a wooden case or in a metal receptacle; or
- (c) In iron drums lined with zinc or lead; or
- (d) In receptacles made of tinplate or of zinc sheet or aluminium sheet which shall be secured by cushioning material in wooden cases.
- (2) Nitrocellulose of item 7 (a), wetted exclusively with water, may be packed in fibreboard drums; this fibreboard must have undergone special treatment so as to render it completely waterproof; the closures of the drums must be leakproof to water vapour.
- (3) Nitrocellulose of item 7 (a), with added xylene, may only be packed in metal receptacles.
- (4) Substances of item 7 (b) and (c) shall be packed:
- (a) In wooden packagings, lined with strong paper or with zinc sheet or aluminium sheet; or
- (b) In strong fibreboard drums, or if the substances are dust-free and the sender certifies this in the consignment note, in cases made of solid, waterproof fibreboard; or
- (c) In sheet metal packagings.
- (5) For substances of item 7, metal receptacles must be so constructed that, by reason of the method of assembly of their walls, of their closure or of the existence of a safety device, they yield when the internal pressure reaches a



value not greater than 3 kg/cm<sup>2</sup>; the presence of these closures or safety devices must neither weaken the strength of the receptacle nor impair its closure.

(6) A package must not weigh more than 75 kg or, if it can be rolled, not more than 300 kg; however, when fibreboard drums are used, a package must not weigh more than 75 kg and when fibreboard cases are used, not more than 35 kg.

(7) For the particulars in the consignment note, see marg. 346 (4).

- 339 (1) Red phosphorus and phosphorus pentasulphide (item 8) shall be packed:
- (a) In receptacles made of sheet iron or tinfoil which shall be placed in a strong wooden case; a package must not weigh more than 100 kg; or
  - (b) In glass or stoneware receptacles, at least 3 mm thick, or in receptacles of a suitable plastics material, each not containing more than 12.5 kg of substance. These receptacles shall be secured with cushioning material in a strong wooden case; a package must not weigh more than 100 kg; or
  - (c) In metal receptacles, which, if they weigh, with their contents, more than 200 kg, shall be fitted with reinforcing hoops at their ends and with rolling hoops.

(2) Phosphorus sesquisulphide (item 8) shall be packed in leakproof metal receptacles which shall be secured by cushioning material in wooden cases with closely fitting walls. A package must not weigh more than 75 kg.

340 Substances of item 9 shall be packed in tightly closed leakproof receptacles.

341 (1) Substances of item 10 shall be packed in receptacle made of metal or wood, or in stout bags.

(2) Wooden receptacles and bags are not, however, to be accepted for coal dust, lignite dust or peat dust artificially prepared unless the dust has been completely cooled after drying by heat.

(3) For the particulars in the consignment note, see marg. 346 (5).

342 (1) Naphthalene of item 11 (a) shall be packed in tightly closed wooden or metal receptacles.

(2) Naphthalene of item 11 (b) shall be packed in receptacles made of wood or metal, or in strong cases made of fibreboard, or in stout bags made of textile or four-ply paper or a suitable plastics material.

When in the form of a fibreboard case, a package must not weigh more than 30 kg.

(3) Naphthalene of item 11 (a) and (b) may also be carried in bulk in conformity with marg. 348 (2) and marg. 350 (3).

(4) Naphthalene of item 11 (c) may not be carried otherwise than in tank wagons (see marg. 349).

### 3. *Mixed packing*

343 (1) Substances grouped under the same item may be packed together in the same package. The inner packagings shall conform requirements prescribed for each substance concerned and the outer packaging shall be that laid down for the substances of the item in question. A package containing celluloid rods and tubes packed together in a fabric wrapping must not weigh more than 75 kg.

(2) If smaller quantities are not prescribed in the section "Packing of individual substances", and if special conditions are not set out below, the substances of this Class, in quantities not exceeding 6 kg for solid substances for the total amount of substances listed under a same item or a same letter, may be

placed together in the same package either with substances of another item or another letter of the same Class, or with substances or articles belonging to other Classes—as long as mixed packing is also permitted for these—or with other goods.

Inner packagings must comply with the general and special packaging conditions. In addition, the general regulations of marg. 4 (6) and 8 must be observed.

A package must not weigh more than 150 kg, or more than 75 kg if it contains fragile receptacles.

*Special conditions:*

Item	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
2 (a)	Sulphur	5 kg	5 kg	Must not be packed together with chlorates, permanganates, perchlorates, peroxides (other than solutions of hydrogen peroxide)
7 (a)	Weakly nitrated nitrocellulose (such as collodion cotton)	100 g	1 kg	
8	Red phosphorus (amorphous)	5 kg	5 kg	
8	Phosphorus sesquisulphide	Mixed packing not permitted		

4. *Marking and danger labels on packages* (see Appendix IX)

344

(1) Every package containing substances of items 4 to 8 must bear a label conforming to model No. 2.

(2) Packages containing fragile receptacles not visible from the outside shall bear a label conforming to model No. 9. If the fragile receptacles contain liquids, the packages shall, in addition, except in the case of sealed ampoules, bear labels conforming to model No. 8; these labels shall be affixed high up on two opposite sides of cases or in an equivalent manner when other packagings are used.

(3) In the case of consignments forwarded as a full wagon load label No. 2 need not be affixed to the packages (see also marg. 351).

B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

345

(1) Substances of items 1, 2 (a), 5 and 6 may be forwarded by *grande vitesse* in less than full wagon loads only if packed for *grande vitesse* carriage in conformity with marg. 333, 336 (2) and 337 (1).

(2) Developed celluloid films (item 5) may also be forwarded as express parcels if they are packed in conformity with marg. 336 (2), and if the sender certifies this method of packing in the consignment note with the words "*Packed for express parcels*"; in this case, a package must not weigh more than 50 kg.

C. PARTICULARS IN THE CONSIGNMENT NOTE

346

(1) The description of the goods in the consignment note must conform to one of the names printed in *italics* in marg. 331. When the name of the sub-

stance is not mentioned in the case of Item I, the trade name must be used. The description of the goods must be *underlined in red* and followed by *particulars of the class, the item number (together with the letter, if any) and the initials "RID"* [e.g. III b, item 7 (a), RID].

(2) In the case of *grande vitesse* consignments of developed celluloid films (item 5) packed in conformity with marg. 336 (2), the sender must certify as follows in the consignment note: "*Grande vitesse packaging*".

(3) In the case of celluloid waste (item 6) packed in stout packing paper or in a suitable plastics material and placed, so packed, in bags made of closely woven rough canvas or jute, the sender must certify as follows in the consignment note: "*Free from waste in the form of dust*".

(4) In the case of substances of item 7 (b) and (c) packed in fibreboard cases, the sender must certify as follows in the consignment note: "*Dust-free substances*".

(5) In the case of coal dust, lignite dust or peat dust (item 10) artificially prepared, and packed in wooden receptacles or in bags [see marg. 341 (2)], the sender must certify as follows in the consignment note: "*Substances completely cooled after drying by heat*".

#### D. TRANSPORT EQUIPMENT

##### 1. Conditions relating to wagons and their loading

###### a. For packages

347 (1) Substances of items 4 to 8 shall be loaded in covered wagons whose ventilator shutters must remain closed.

(2) As regards the use of electrically-fitted wagons for the carriage of substances of items 3 to 7, see Appendix IV.

###### b. For carriage in bulk

348 (1) Substances of items 1 and 2 (a), in bulk, shall be loaded in covered wagons or in sheeted open wagons. For rushes and reeds without leaves and beards, tightly compressed, open wagons without sheets are also to be accepted during the months October to April. In the case of sawdust, open wagons without sheets are also to be accepted when the load is covered over in some other manner without leaving any spaces, for example by boards or by waste wood partly overlapping.

NOTE. The regulations prescribing loading in covered wagons or in sheeted open wagons is not applicable when substances of item 1 are used as packing or filling material and when their weight does not exceed 3% of the total weight of the consignment.

(2) Naphthalene of item 11 (a) and (b), in bulk, shall be loaded in steel wagons with movable covers or in open steel wagons, covered over with non-inflammable sheets, or in open wagons covered over with non-inflammable sheets and whose wooden flooring shall be protected by a closely woven sheet. For naphthalene of item 11 (a), the floor of the wagon must be protected by an oil-proof lining.

###### c. For tank wagons

349 (1) Sulphur of item 2 (b) and naphthalene of item 11 (c) shall be carried in tank wagons whose receptacles and closures must satisfy the regulations of marg. 332 and the following conditions.

(2) Receptacles must be made of steel at least 6 mm thick. For sulphur of item 2 (b), receptacles may also be made of an aluminium alloy of an adequate chemical resistance. The necessary thickness of the walls of receptacles made

of aluminium alloy shall be calculated in such a way as to take account of the filling temperature of liquid sulphur and its effects on the yield stress of the alloy.

(3) Receptacles must be fitted with heat insulation made of materials not readily inflammable, so that the external temperature of the insulation does not exceed 70° C during carriage. Receptacles shall be fitted with valves opening automatically inwards or outwards, under the effect of a difference of pressure of between 0.2 and 0.3 kg/cm<sup>2</sup>. Valves are not necessary when the receptacle is designed for a working pressure of at least 2 kg/cm<sup>2</sup> and has been tested under an internal pressure of at least 2.6 kg/cm<sup>2</sup>. The emptying devices must be protected by metal caps and be capable of being bolted.

(4) Receptacles for sulphur shall only be filled to 98% of their capacity; they shall be marked to indicate the net weight which must not be exceeded.

d. *For small containers*

350 (1) Packages containing substances set out in this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 352 must be applied to the contents of a small container.

(3) Substances of item 1, sulphur of item 2 (a) and naphthalene [item 11 (a) and (b)] may also be enclosed without inner packaging in small containers of the closed type with complete walls. Small wooden containers must, for the carriage of naphthalene, have a lining impervious to oils.

2. *Marking and danger labels on wagons and on small containers* (see Appendix IX).

351 (1) Wagons in which substances of items 4 to 8 are loaded shall bear on both sides labels conforming to model No. 2.

(2) Small containers in which substances of items 4 to 8 are loaded shall bear a label conforming to model No. 2.

Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

E. PROHIBITIONS ON MIXED LOADING

352 Substances of Class III b must not be loaded in the same wagon together:

(a) With substances and articles of Class I a (marg. 21);

(b) With substances of Class III c (marg. 371);

(c) With substances of Class IV a, item 5 (marg. 401);

(d) With substances of Class V, items 2 (a) and 3 (a) (marg. 501);

(e) With substances of Class VII (marg. 701).

353 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon (art. 6, para. 10 (d), of CIM).

F. EMPTY PACKAGINGS

354 No regulations.

G. OTHER REGULATIONS

355 No regulations.

356-369

## CLASS III c. OXIDISING SUBSTANCES

1. *List of substances*

**370** Among the substances and articles covered by the heading of Class III c, those listed in marg. 371 are subject to the conditions set out in marg. 371 to 392 and are consequently substances and articles of RID.

NOTE. Unless specifically listed in Class I a or Class I c, mixtures of oxidising substances with combustible substances are not to be accepted for carriage when they may explode in contact with a flame or are more sensitive to shock and to friction than dinitrobenzene.

**371** 1. Aqueous solutions of hydrogen peroxide containing more than 60% stabilised hydrogen peroxide and stabilised *hydrogen peroxide* itself.

NOTE. 1. For aqueous solutions of hydrogen peroxide containing not more than 60% hydrogen peroxide, see marg. 501, item 41.

2. Aqueous solutions of hydrogen peroxide containing more than 60% hydrogen peroxide, not stabilised, and hydrogen peroxide, not stabilised, are not to be accepted for carriage.

2. *Tetranitromethane* free from combustible impurities.

NOTE. Tetranitromethane not free from combustible impurities is not to be accepted for carriage.

3. *Perchloric acid* in aqueous solutions containing more than 50% but not more than 72.5% perchloric acid ( $\text{HClO}_4$ ). See also marg. 371 a under (a).

NOTE. Perchloric acid in aqueous solutions containing not more than 50% perchloric acid ( $\text{HClO}_4$ ) is a substance of Class V [see marg. 501, item 4]. Aqueous solutions of perchloric acid containing more than 72.5% perchloric acid are not to be accepted for carriage; the same applies to mixtures of perchloric acid with any liquid other than water.

4. (a) *Chlorates*; inorganic *chlorate weed-killers* comprising mixtures of sodium, potassium or calcium chlorates with a hygroscopic chloride (such as magnesium or calcium chloride);

NOTE. Ammonium chlorate is not to be accepted for carriage.

(b) *Perchlorates* [with the exception of ammonium perchlorate, see item (5)];

(c) *Sodium and potassium chlorites*;

(d) *Mixtures of chlorates, perchlorates and chlorites* of (a), (b) and (c) with one another.

For (a), (b), (c) and (d), see also marg. 371 a under (b).

5. *Ammonium perchlorate*. See also marg. 371 a under (b).

6. (a) *Ammonium nitrate* not containing combustible substances in a higher proportion than 0.4%;

NOTE. Ammonium nitrate with more than 0.4% combustible substances is not to be accepted for carriage unless it is a constituent of an explosive of item 12 or item 14 of marg. 21.

(b) *Mixtures of ammonium nitrate with ammonium sulphate or ammonium phosphate* containing more than 40% nitrate, but containing not more than 0.4% combustible substances;

(c) *Mixtures of ammonium nitrate with an inert substance* (e.g. diatomaceous earth, calcium carbonate, potassium chloride) containing more

than 65% nitrate, but containing not more than 0.4% combustible substances.

For (a), (b) and (c), see also marg. 371 a under (b).

NOTE. 1. Mixtures of ammonium nitrate with ammonium sulphate or ammonium phosphate containing not more than 40% nitrate and mixtures of ammonium nitrate with an inert inorganic substance containing not more than 65% nitrate are not subject to the provisions of RID.

2. In the mixtures referred to under (c) only inorganic substances which are neither combustible nor oxidising may be considered as inert.

3. Compound fertilisers in which the nitrogen content as nitrate and as ammonia does not exceed 14% or in which the nitrogen content as nitrate does not exceed 7% are not subject to the provisions of RID.

7. (a) *Sodium nitrate*;  
 (b) *Mixtures of ammonium nitrate with sodium, potassium, calcium or magnesium nitrate*;  
 (c) *Barium nitrate, lead nitrate*.

For (a), (b) and (c), see also marg. 371 a under (b).

NOTE. 1. If they contain not more than 10% ammonium nitrate, mixtures of ammonium nitrate with calcium nitrate, or with magnesium nitrate, or with both are not subject to the provisions of RID.

2. Empty textile bags which have contained sodium nitrate and have not been entirely freed from the nitrate impregnating them are articles of Class II (see marg. 201, item 13).

8. *Inorganic nitrites*. See also marg. 371 a under (b).

NOTE. Ammonium nitrite and mixtures of an inorganic nitrite with an ammonium salt are not to be accepted for carriage.

9. (a) *Peroxides of alkali metals and mixtures containing peroxides of alkali metals which are not more dangerous than sodium peroxide*;  
 (b) *Peroxides (dioxides) of alkaline earth metals; e.g. barium peroxide*;  
 (c) *Sodium, potassium, calcium and barium permanganates*.

For (a), (b) and (c), see also marg. 371 a under (b).

NOTE. Ammonium permanganate as well as mixtures of a permanganate with an ammonium salt are not to be accepted for carriage.

10. *Chromium trioxide* (also called *chromic acid, chromic anhydride*). See also marg. 371 a under (b).  
 11. *Empty packagings, uncleaned, including receptacles of tank wagons, small containers and small tank containers, which have contained substances of Class III c*.

NOTE. Empty packagings which have contained a chlorate, a perchlorate, a chlorite (items 4 and 5), an inorganic nitrite (item 8) or substances of items 9 and 10, to the outside of which residues from their former contents still adhere, are not to be accepted for carriage.

**371a** Substances handed over for carriage in conformity with the following provisions are not subject to the regulations of chapter 2 "Conditions of carriage":

- (a) Substances of Item 3, in quantities not exceeding 200 g, on condition that they are packed in leakproof receptacles not liable to attack by the contents and that the receptacles are packed, not more than 10 per case, in wooden cases with inert absorbent cushioning material;

- (b) Substances of items 4 to 10, in quantities not exceeding 10 kg, packed not more than 2 kg per receptacle in leakproof receptacles not liable to attack by the contents, these receptacles being placed in strong leakproof packagings made of wood or sheet metal with leakproof closures.

## 2. *Conditions of carriage*

(The regulations relating to empty receptacles are to be found under F.)

### A. PACKAGES

#### 1. *General conditions for packing*

372 (1) Receptacles shall be so closed and arranged as to prevent any loss of the contents.

(2) The materials of which the packagings and their closures are made must not be liable to attack by the contents or form harmful or dangerous compounds therewith.

(3) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. In particular, where substances are in the liquid state, receptacles and their closures must, unless the section headed "Packing of individual substances" provides otherwise, be able to withstand any pressure which, the presence of air also being taken into account, may arise inside the receptacles in normal carriage. For this purpose a free space must be left, account being taken of the difference between the temperature of the substances at the time of filling and the highest mean temperature which they are likely to reach during carriage. Unless otherwise specified in the section "Packing of individual substances", inner packagings may be enclosed in outer packagings, either singly or in groups.

(4) Bottles and other glass receptacles must be free from faults of a nature liable to impair their strength; in particular, internal stresses must have been suitably relieved. The thickness of the walls must be not less than 3 mm in the case of receptacles which, with their contents, weigh more than 35 kg, and not less than 2 mm in the case of other receptacles.

The tightness of the closure system must be ensured by an additional device (cap, crown, seal, binding, etc.) capable of preventing any loosening of the closure system during carriage.

(5) When receptacles made of glass, porcelain, stoneware or similar materials are prescribed or allowed, they must be secured by cushioning material in protective packagings. Cushioning material must be incombustible (asbestos, glass wool, absorbent earth, diatomaceous earth, etc.) and must not form dangerous compounds with the contents of the receptacles. If the contents are liquid, the cushioning material shall also be absorbent and proportionate in quantity to the liquid; this interior absorbent layer must not, however, be less than 4 cm thick at any point.

#### 2. *Packing of individual substances*

373 (1) Aqueous solutions of hydrogen peroxide and hydrogen peroxide itself of item 1 shall be packed in drums or other receptacles made of aluminium at least 99.5% pure or of special steel not liable to cause the hydrogen peroxide to decompose. These receptacles shall be fitted with means of handling; they must be able to remain upright in a stable fashion and must:

- (a) Be fitted in their upper part with a closing device ensuring equalisation of the internal pressure with that of the atmosphere; this closing device must be

such as to prevent in all circumstances any escape of the liquid and any entry of foreign matter into the receptacle and must be protected by a vented cap; or

- (b) Be able to withstand an internal pressure of 2.5 kg/cm<sup>2</sup> and be fitted in the upper part with a safety device yielding to a maximum internal pressure of 1.0 kg/cm<sup>2</sup>.
- (2) Receptacles shall not be filled beyond 90% of their capacity.
- (3) A package must not weigh more than 90 kg.
- (4) For carriage in tank wagons, see marg. 386.
- 374** (1) Tetranitromethane (item 2) shall be contained in bottles made of glass, porcelain, stoneware or similar materials or of an appropriate plastics material, with incombustible stoppers, placed inside a wooden case with complete panels; fragile receptacles shall be packed in absorbent earth. Receptacles shall not be filled beyond 93% of their capacity.
- Packages containing fragile receptacles sent in less than full wagon loads must not weigh more than 75 kg and shall be fitted with means of handling.
- (2) For carriage in tank wagons, see marg. 386.
- 375** (1) Perchloric acid in aqueous solutions (item 3) shall be contained in glass receptacles, which shall not be filled beyond 93% of their capacity. Receptacles shall be secured by means of absorbent incombustible material in incombustible protective packagings which are impervious to liquids and capable of retaining the contents of the receptacles. The closures of the receptacles shall be protected by caps, if the protective packagings are not completely closed.
- Glass bottles closed by glass stoppers may also be secured by absorbent incombustible cushioning material in wooden cases with complete panels.
- Packages containing fragile receptacles sent in less than full wagon loads must not weigh more than 75 kg and shall be fitted with means of handling.
- (2) For carriage in tank wagons, see marg. 386.
- 376** (1) Substances of items 4 and 5 and solutions of substances of item 4 shall be packed in receptacles made of glass, a suitable plastics material or metal; solid substances of item 4 (b) may also be contained in hardwood casks.
- (2) Fragile receptacles and receptacles made of a plastics material must be secured by cushioning material in metal or wooden protective packagings. They may also be secured individually by incombustible filling materials in non-fragile inner receptacles which in their turn shall be firmly placed or secured by cushioning material in protective packagings. Each receptacle must contain not more than 5 kg of the substance. In the case of receptacles with liquid contents, the filling materials must be absorbent.
- (3) In the case of receptacles made of a plastics material and containing solutions of substances of item 4, protective packagings need not be used if the thickness of the walls throughout is at least 4 mm, the walls are reinforced by means of stout rims, the ends are reinforced, the upper part is fitted with two strong handles and the opening is fitted with a screw-threaded closure.
- (4) Receptacles for liquids shall not be filled beyond 95% of their capacity.
- (5) Packages containing fragile receptacles or receptacles made of a plastics material [see (2) and (3)], if they contain liquids, and packages containing fragile receptacles or receptacles made of plastics material [see (2)], if they contain solid substances only and are sent in less than full wagon loads, must not weigh more than 75 kg. Packages carried in less than full wagon loads must be fitted with means of handling.



(6) Packages capable of being rolled must not weigh more than 400 kg; if they weigh more than 275 kg, they must be fitted with rolling hoops.

(7) Receptacles containing solid chlorates other than those referred to under (8) must contain no combustible material other than a small pad of waxed paper.

(8) If the chlorate is in the form of tablets, with or without a suitable binding agent, and if it is packed in bottles containing not more than 200 g, cotton wool may be used in sufficient quantity to prevent excessive movement of the tablets in the bottle. The bottles shall be packed in fibreboard boxes, placed in an inner packaging separate from the outer packaging. An inner packaging may not contain more than 1 kg or a package more than 6 kg of chlorate.

(9) For the carriage of solids in bulk, see marg. 385 and 387 (3); for the carriage of solutions in tank wagons, jar wagons or small tank containers, see marg. 386 and 387 (3).

377

(1) Substances of items 6, 7 and 8 shall be packed:

(a) In drums or in cases; or

(b) In stout, closely woven bags or in bags of strong paper of at least five plies or, in quantities of 50 kg at the most, in bags of a suitable plastics material sufficiently thick and strong to prevent any loss of the contents.

If the substance is more hygroscopic than sodium nitrate, the closely woven bags or those of strong paper of five-ply strength must be lined with a suitable plastics material or waterproofed by suitable means.

Packages capable of being rolled must not weigh more than 400 kg; if they weigh more than 275 kg, they must be fitted with rolling hoops.

(2) For the carriage in bulk of substances of items 6 and 7, see marg. 385 and 387 (3).

378

(1) Substances of item 9 (a) shall be packed:

(a) In steel drums; or

(b) In receptacles made of sheet metal, lead-lined sheet iron or tinplate, secured in a wooden packing case fitted with a metal lining made leakproof, for example by soldering. When handed over for carriage in full wagon loads, substances of item 9 (a) packed in tinplate receptacles may be placed merely in protective iron baskets.

(2) Receptacles containing substances of item 9 (a) must be so closed and leakproof as to prevent moisture entering.

(3) Substances of item 9 (b) and (c) shall be packed:

(a) In incombustible receptacles fitted with an incombustible hermetic closure. If the incombustible receptacles are fragile, each shall be secured separately by cushioning material in a wooden case lined with stout paper; or

(b) In hardwood casks with closely fitting staves, lined with stout paper.

(4) Packages containing fragile receptacles sent in less than full wagon loads must not weigh more than 75 kg and shall be fitted with means of handling. Packages capable of being rolled must not weigh more than 400 kg; if they weigh more than 275 kg, they must be fitted with rolling hoops.

379

(1) Chromium trioxide (item 10) shall be packed:

(a) In receptacles made of glass, porcelain, stoneware or similar materials, tightly stoppered, which shall be secured by inert and absorbent cushioning material in a wooden case; or

(b) In metal drums.

(2) Packages containing fragile receptacles sent in less than full wagon loads must not weigh more than 75 kg and shall be fitted with means of handling. Packages capable of being rolled must not weigh more than 400 kg; if they weigh more than 275 kg, they must be fitted with rolling hoops.

### 3. *Mixed packing*

380

(1) Substances grouped under the same item may be packed together in the same package. The inner packagings shall conform to the requirements prescribed for each substance, and the outer packaging shall be that laid down for the substances of the item in question.

(2) If smaller quantities are not prescribed in the section "Packing of individual substances", and if special conditions are not set out below, the substances of this Class, in quantities not exceeding 6 kg in the case of solid substances or 3 litres in the case of liquid substances for the total amount of substances listed under a same item or a same letter, may be placed together in the same package either with substances of another item or another letter of the same Class or with substances or articles belonging to other Classes—as long as mixed packing is also permitted for these—or with other goods.

Inner packagings must comply with the general and special packaging conditions. In addition, the general regulations of marg. 4 (6) and 8 must be observed.

A package must not weigh more than 150 kg or more than 75 kg if it contains fragile receptacles.

#### *Special conditions:*

Item	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
1 2 3 4	Hydrogen peroxide and aqueous solutions of hydrogen peroxide containing more than 60% of hydrogen peroxide Tetranitromethane Perchloric acid Solutions of substances of Item 4	Mixed packing not permitted		
4 (a)	Chlorates —In fragile receptacles —In other receptacles	1 kg 5 kg	2.75 kg 5 kg	Must not be packed together with weakly nitrated nitrocellulose, red phosphorus, di-fluorides, halogenated liquid irritant substances, hydrochloric acid, sulphuric acid, chlorosulphonic acid, acetic acid, benzoic acid, salicylic acid, formic acid, nitric acid, free sulphonic acids, mixed nitrating acids, sulphur, hydrazine. Must be kept apart from elemental carbon (whatever its form),

Item	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
				hypophosphites, ammonia and its compounds, triethanolamine, aniline, xylydine, toluidine and inflammable liquids with a flash-point below 21° C.
4 (b) and 5	Perchlorates	5 kg	5 kg	Must not be packed together with weakly nitrated nitrocellulose, red phosphorus, difluorides, halogenated liquid irritant substances, hydrochloric acid, sulphuric acid, chlorosulphonic acid, nitric acid, mixed nitrating acids, aniline, pyridine, xylydine, toluidine, sulphur, hydrazine.
4 (c) and (d), 6, 7, 8	All substances			Must not be packed together with weakly nitrated nitrocellulose and red phosphorus.
9 (a) and (b)	Peroxides —In fragile receptacles —In other receptacles	500 g 5 kg	2.5 kg 5 kg	Same substances prohibited as in the case of perchlorates, and in addition: aluminium dust, powder or particles, acetic acid; aqueous liquids, inflammable liquids of Classes III a and IV a, substances of Class III b; metallic peroxides must not be packed in the same package with solutions of hydrogen peroxide. The limit of 2.5 kg applies to peroxides of item 9 (a) and (b) as a total for these substances. Wood sawdust or other organic materials must not be used as cushioning.
9 (c)	Permanganates	5 kg	5 kg	Same substances not permitted as for chlorates, and in addition: solutions of hydrogen

Item	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
				peroxide, glycerine, glycols. Must be kept apart from the same substances as indicated in the case of chlorates.
10	Chromium trioxide (chromic acid, chromic anhydride)	4.5 kg	4.5 kg	Wood sawdust or other organic materials must not be used for cushioning.

4. *Marking and danger labels on packages* (see Appendix IX).

381 (1) Every package containing substances of Class III c must bear a label conforming to model No. 3. Packages containing substances of item 3 shall, in addition, bear a label conforming to model No. 5.

(2) Packages containing fragile receptacles not visible from the outside shall bear a label conforming to model No. 9. If the fragile receptacles contain liquids, the packages shall in addition, except in the case of sealed ampoules, bear labels conforming to model No. 8; these labels shall be affixed high up on two opposite sides of cases or in an equivalent manner when other packagings are used.

(3) In the case of consignments forwarded as a full wagon load labels Nos. 3 and 5, as prescribed under (1), need not be affixed to the packages (see also marg. 388).

B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

382 Substances of items 1 to 3 may not be forwarded by *grande vitesse* otherwise than in full wagon loads.

C. PARTICULARS IN THE CONSIGNMENT NOTE

383 The description of the goods in the consignment note must conform to one of the names printed in *italics* in marg. 371; it must be *underlined in red* and followed by *particulars of the Class, the item number (together with the letter, if any), and the initials "RID"* [e.g. *III c, item 4 (a), RID*].

D. TRANSPORT EQUIPMENT

1. *Conditions relating to wagons and their loading*

a. *For packages*

384 (1) Wagons intended to receive substances of Class III c must be carefully cleaned and, in particular, freed from all combustible debris (straw, hay, paper, etc.).

(2) In any load fragile receptacles must rest on a strong floor and be so wedged as to prevent any displacement and any spillage of the contents.

(3) The use of straw or any other readily inflammable substance for wedging is forbidden.

(4) When a load contains both glass carboys and stoneware jars, these should be grouped according to their type.

(5) Metal receptacles containing substances of item 1 should be so placed that their openings are uppermost and should be wedged so that they cannot overturn.

(6) If packages, other than metal drums, containing substances of items 4, 6, 7 and 8 are loaded in open wagons, these should be covered with sheets.

(7) Tetranitromethane of item 2, barium chlorate of item 4 (a), barium perchlorate of item 4 (b), barium nitrate and lead nitrate [item 7 (c)], inorganic nitrites of item 8, barium peroxide of item 9 (b), barium permanganate of item 9 (c) shall be kept apart in wagons from foodstuffs or other articles for consumption.

(8) As regards the use of electrically-fitted wagons, see Appendix IV.

b. *For carriage in bulk*

385 (1) The only solids of Class III c which may be carried in bulk are those of items 4 to 6, 7 (a) and (b), namely:

(a) Substances of items 4 and 5:

1. In metal "wagons-cuves" (open metal vat-wagons without doors) which shall be covered with a non-inflammable, waterproof sheet;
2. In large leakproof metal containers in which the product cannot come into contact with wood or any other combustible material.

(b) Substances of items 6 and 7 (a) and (b).

1. In metal wagons in which the product cannot come into contact with wood or any other combustible material;
2. In wooden wagons whose floor and sides shall have been completely covered with a waterproof and incombustible lining or with a coating of sodium silicate or a similar product.

(2) If open wagons are used, they must be provided with a tilt-bar and covered with a non-inflammable waterproof sheet.

(3) After unloading, wagons which have contained substances of items 4 to 6, 7 (a) and (b) must be swilled out.

(4) As regards the use of electrically-fitted wagons, see Appendix IV.

c. *For tank wagons*

386 (1) Substances of items 1 to 3 may be carried in tank wagons and solutions of substances of item 4 in tank wagons or jar wagons. Receptacles and their closures shall be in conformity with the general conditions for packing laid down in (1), (2) and (3) of marg. 372 [see, however, under (2)].

(2) In the case of aqueous solutions of hydrogen peroxide and hydrogen peroxide itself of item 1 only receptacles made of aluminium at least 99.5% pure are to be accepted. Receptacles must be fitted on top with a closing device preventing any excess pressure occurring inside the receptacle as well as any spillage of the liquid and the entry of foreign matter into the receptacle. The receptacles shall have all their openings above the level of the liquid; no piping or branch-pipe shall traverse the walls of the receptacle below the level of the liquid.

No part of the tank wagon may be of wooden construction unless it is protected by a suitable covering. The interior of the receptacle and all metal parts liable to come into contact with the hydrogen peroxide must be kept in a state of absolute cleanliness. The joints of the pipes used for filling and emptying receptacles must be made of a suitable plastics material.

No lubricant other than petroleum jelly, pure liquid paraffin, pure paraffin wax or silicone lubricant free from metal soaps must be used for pumps, valves or other fittings coming into contact with the hydrogen peroxide.

(3) Receptacles containing liquids of items 1 to 3 must not be filled beyond 95% of their capacity.

d. *For small containers*

387 (1) With the exception of fragile packages as specified in marg. 4 (5) and those containing solutions of hydrogen peroxide or hydrogen peroxide itself (item 1) or tetranitromethane (item 2), packages containing substances set out in this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 389 must be applied to the contents of a small container.

(3) Solids of items 4 to 6, 7 (a) and (b) may also be enclosed without inner packaging in small metal containers of the closed type with complete walls.

Solutions of substances of item 4 may also be carried in small tank containers.

2. *Marking and danger labels on wagons and on small containers* (see Appendix IX)

388 (1) Wagons in which substances of Class III c are loaded shall bear on both sides labels conforming to model No. 3.

(2) Small containers in which substances of item 3 are loaded shall bear labels conforming to models Nos. 3 and 5.

(3) Small containers and small tank containers in which substances of items 4 to 10 are loaded shall bear a label conforming to model No. 3.

(4) Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

E. PROHIBITIONS ON MIXED LOADING

389 (1) Substances of Class III c must not be loaded in the same wagon together:

(a) With substances and articles of Class I a (marg. 21);

(b) With articles of Class I b (marg. 61);

(c) With phosgene and cyanogen chloride of Class I d, item 8 (a) (marg. 131);

(d) With substances of marg. 201, items 3, 4 and 11, and with all other substances of Class II (marg. 201), when their outer packaging does not consist of metal receptacles;

(e) With substances of Class III a (marg. 301);

(f) With substances of Class III b (marg. 331);

(g) With substances of Class IV b (marg. 451).

(2) Substances of item 3 must not be loaded in the same wagon together with substances of Class IV a, items 32 and 33 (marg. 401).

(3) Substances of item 4 (a), (c) and (d) must not be loaded in the same wagon together with substances of items 1 and 3, mixtures containing sulphuric acid of item 5, sulphur trioxide of item 9 or chlorosulphonic acid of item 11 (a) of Class V (marg. 501);

In addition, substances of items 4 and 5 must not be loaded in the same wagon together with aniline—except in quantities not exceeding 5 litres, packed in conformity with marg. 408 (2) (a)—of Class IV a, item 11 (b) (marg. 401).

(4) Substances of items 4 (a), 8 and 9 (c) must not be loaded in the same wagon together with substances of item 6 (a), (b) and (c), or with other ammonium salts, or with a mixture having an ammonium-salt base.

390 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon [art. 6, para. 10 (d), of CIM].

#### F. EMPTY PACKAGINGS

391 (1) Packagings of item 11 must be closed in the same manner and leakproof in the same degree as though they were full.

(2) The description in the consignment note must read: "*Empty packaging, III c, item 11, RID*". This description must be *underlined in red*.

(3) Empty textile bags, uncleaned, which have contained sodium nitrate [item 7 (a)] are subject to the regulations of Class II (see marg. 211).

#### G. OTHER REGULATIONS

392 Tetranitromethane of item 2, barium chlorate of item 4 (a), barium perchlorate of item 4 (b), barium nitrate and lead nitrate of item 7 (c), inorganic nitrites of item 8, barium peroxide of item 9 (b) and barium permanganate of item 9 (c) shall be kept apart in goods depots from foodstuffs or other articles for consumption.

393-399

### CLASS IV a. POISONOUS SUBSTANCES

#### 1. List of substances

400 (1) Among the substances and articles covered by the heading of Class IV a, those listed in marg. 401 or which come under a collective heading of this marginal are subject to the conditions set out in marg. 400 (2) to 444 and are consequently substances and articles of RID.

(2) Substances of Class IV a which polymerise easily are not to be accepted for carriage unless the necessary measures have been taken to prevent their polymerisation during carriage.

(3) The flash-point referred to below shall be determined in the manner described in Appendix III.

401 A. POISONOUS SUBSTANCES HAVING A FLASH-POINT BELOW 21° C AND A BOILING-POINT BELOW 200° C.

1. Hydrocyanic acid and inflammable volatile substances having a similar toxic effect, such as:

(a) *Hydrocyanic acid* containing not more than 3% water (absorbed by an inert porous substance or in a liquid state), provided that the filling of receptacles was carried out less than one year previously;

NOTE. Hydrocyanic acid not satisfying these conditions is not to be accepted for carriage.

(b) *Aqueous solutions of hydrocyanic acid* containing not more than 20% pure acid (HCN).

NOTE. Solutions of hydrocyanic acid containing more than 20% hydrocyanic acid (HCN) are not to be accepted for carriage.

2. Organic cyanides (nitriles), such as:

(a) *Acrylonitrile*;

- (b) *Acetonitrile* (methyl cyanide);
- (c) *Isobutyronitrile* (*isobutyric nitrile*).

3. Other nitrogenous organic substances having a toxicity not lower than that of *ethyleneimine* containing a total chlorine content of not more than 0.003% and its aqueous solutions.

NOTE. Ethyleneimine of any other nature is not to be accepted for carriage.

4. Halogenated organic substances, such as:

- (a) *Allyl chloride*;
- (b) *Methyl chloroformate*;
- (c) *Ethyl chloroformate*.

5. Metal carbonyls, such as:

- (a) *Nickel carbonyl* (nickel tetracarbonyl);
- (b) *Iron carbonyl* (iron pentacarbonyl).

**B. POISONOUS SUBSTANCES HAVING A FLASH-POINT OF 21° C OR OVER AND NON-INFLAMMABLE POISONOUS SUBSTANCES, BOTH HAVING A BOILING-POINT BELOW 200° C**

11. Nitrogenous organic substances, such as:

- (a) *2-cyanopropan-2-ol* (*acetone cyanohydrin*);
- (b) *Aniline*.

12. Halogenated organic substances, such as:

- (a) *1-chloro-2,3-epoxypropane* (*epichlorohydrin*);
- (b) *2-chloroethanol* (*ethylene chlorohydrin*);
- (c) *1,1,2,2-tetrachloroethane*;
- (d) *Chloropicrin*;

NOTE. Mixtures of chloropicrin with chloromethane or bromomethane are substances of Class I d if the vapour pressure of the mixture at 50° C exceeds 3 kg/cm<sup>2</sup> [see marg. 131, item 8 (a)].

- (e) *Trichloromethanesulphenyl chloride* (thiocarbonyl tetrachloride, perchlorated methyl mercaptan);
- (f) *2,2-dichlorodiethyl ether* (chloroethyl ether, 2-chloroethyl ether);

13. Oxygenated organic substances, such as:

- (a) *Allyl alcohol*;
- (b) *Dimethyl sulphate*;
- (c) *Phenol*.

14. Lead alkyls, such as *tetraethyl-lead*, *tetramethyl-lead*, and mixtures of lead alkyls with organic halogenated compounds, e.g. *ethyl fluid*.

**C. POISONOUS ORGANIC SUBSTANCES HAVING A BOILING-POINT OF 200° C OR OVER**

21. Nitrogenous organic substances, such as:

- (a) *2-bromophenylacetoneitrile* (bromobenzyl cyanide);
- (b) *Phenylcarbylamine chloride*;
- (c) *2,4-diisocyanatotoluene*;



- (d) *Allyl isothiocyanate*;
  - (e) *Chloroanilines*;
  - (f) *Mononitroanilines and dinitroanilines*;
  - (g) *Naphthylamines*;
  - (h) *2,4-diaminotoluene*;
  - (i) *Dinitrobenzenes*;
  - (k) *Chloronitrobenzenes*;
  - (l) *Mononitrotoluenes*;
  - (m) *Dinitrotoluenes*;
  - (n) *Nitroxylens*;
  - (o) *Toluidines*;
  - (p) *Xylidines*.
22. Oxygenated organic substances not covered by items 21 and 23, such as:
- (a) *Cresols*;
  - (b) *Xylenols*.
23. Organic halogenated substances not covered by item 21, such as:
- (a) *Xylyl bromide*;
  - (b) *Phenacyl chloride* ( $\omega$ -chloroacetophenone);
  - (c) *Phenacyl bromide* ( $\omega$ -bromoacetophenone);
  - (d) *4-chloroacetophenone*;
  - (e) *1,3-dichloroacetone*.
- D. INORGANIC SUBSTANCES WHICH MAY RELEASE POISONOUS GASES ON CONTACT WITH ACIDS (see, however, under E. for silicon alloys)
31. Inorganic cyanides:
- (a) *Cyanides and complex cyanides in a solid form*;
  - (b) *Solutions of inorganic cyanides*;
  - (c) *Preparations of inorganic cyanides*.
- NOTE. Ferrocyanides and ferricyanides are not subject to the provisions of RID.
32. The following azides:
- (a) *Sodium azide*;
  - (b) *Barium azide with not less than 50% water or alcohols, and aqueous solutions of barium azide*.
- NOTE. Barium azide in the dry state or with less than 50% water or alcohols is not to be accepted for carriage.
33. *Zinc phosphide*.
- NOTE. Zinc phosphide capable of spontaneous combustion or, under the effect of moisture, of releasing poisonous gases, is not to be accepted for carriage.
- E. SILICON ALLOYS CAPABLE OF RELEASING POISONOUS GASES
41. (a) *Ferro-silicon and mangano-silicon with more than 30% and less than 70% silicon*;

(b) *Ferro-silicon alloys with aluminium, manganese, calcium or more than one of these metals, whose total content of silicon and of elements other than iron and manganese is greater than 30% but less than 70%.*

All the substances of item 41 must have been in a dry place open to the air for at least three days.

NOTE. 1. Ferro-silicon and manganese-silicon briquettes, whatever the silicon content, are not subject to the provisions of RID.

2. Substances of item 41 are not subject to the provisions of RID if they are not liable to release dangerous gases under the effect of moisture during carriage and the sender so certifies in the consignment note.

3. Substances of item 41 which have not been stored in a dry place open to the air for at least 3 days are not to be accepted for carriage.

#### F. OTHER POISONOUS INORGANIC SUBSTANCES

51. *Beryllium* in powder form; *compounds of beryllium* in powder form.

52. Arsenical compounds, such as:

(a) *Oxides of arsenic;*

(b) *Sulphides of arsenic.*

NOTE. For arsenical substances and preparations used as pesticides, see under items 81 (i), 82 (i) and 83 (i).

53. Mercury compounds, such as:

*Mercuric chloride* (corrosive sublimate),

but with the exception of cinnabar and mercurous chloride (calomel).

NOTE. For mercury substances and preparations used as pesticides, see under items 81 (f), 82 (f) and 83 (f).

54. *Thallium compounds.*

NOTE. For thallium substances and preparations containing thallium and used as pesticides, see under items 81 (h), 82 (h) and 83 (h).

#### G. HALOGENATED ORGANIC SUBSTANCES, HAVING A HARMFUL OR IRRITANT EFFECT

61. Halogenated organic substances, volatile, inflammable or non-inflammable having a flash-point of 21° C or over and a boiling-point below 200° C, such as:

(a) *1,2-dibromoethane;*

(b) *Chloroacetone;*

(c) *Bromoacetone;*

(d) *1,2-dibromobutan-3-one;*

(e) *Methyl chloroacetate;*

(f) *Ethyl chloroacetate;*

(g) *Methyl bromoacetate;*

(h) *Ethyl bromoacetate;*

(i) *1,1-dichloro-1-nitroethane;*

(k) *Benzyl chloride;*

(l) *1-chloro-1-nitropropane.*

62. Halogenated organic substances of low volatility having a boiling-point of 200° C or over and not covered by item 23, such as:

- (a) *Benzyl iodide*;  
(b) 1,1,2,2-tetrabromoethane (acetylene tetrabromide).

#### H. INORGANIC SUBSTANCES HAVING A HARMFUL EFFECT

71. Barium compounds, such as *barium oxide*, *barium hydroxide*, *barium sulphide* and *barium salts* except barium sulphate and barium titanate).

NOTE. Barium chlorate, perchlorate, nitrate, nitrite, peroxide and permanganate are substances of Class III c [see marg. 371, under items 4 (a) and (b), 7 (c), 8 and 9 (c)].

72. Lead compounds, such as *lead oxides*, *lead salts* including *lead acetate*, *lead pigments* (as for example, *white lead* and *lead chromate*), except lead titanate and galena.

NOTE. Lead chlorate, perchlorate and nitrate are substances of Class III c [see marg. 371, items 4 (a) and (b) and 7 (c)].

73. *Residues and wastes* containing compounds of *antimony* or of *lead* or of both, for example *ashes of lead* or of *antimony* or of *lead and antimony*; *lead sludges* containing less than 3% free acid.

NOTE. Lead sludges containing 3% or more free acid are substances of Class V [see marg. 501, item 1 (e)].

74. Vanadium compounds in powder form, such as *vanadium pentoxide* and *the vanadates*.

NOTE. Vanadium chlorate and vanadium perchlorate are substances of Class III c [see marg. 371, item 4 (a) and (b)].

75. Antimony compounds such as *antimony oxides* and *salts of antimony*, except stibnite.

NOTE. Antimony chlorate and antimony perchlorate are substances of Class III c [see marg. 371, item 4 (a) and (b)]. Antimony pentachloride, antimony trichloride and antimony pentafluoride are substances of Class V [see marg. 501, items 11 (a), 12 and 15 (b)].

#### I. SUBSTANCES AND PREPARATIONS USED AS PESTICIDES

81. Substances and preparations presenting a risk of very severe poisoning:

- (a) Organo-phosphorus compounds, such as: *azinphos-ethyl*, *azinphos-methyl*, *demeton-O+S*, *dimefox*, *endothion*, *HETP*, *mecarbam*, *parathion-methyl*, *mevinphos*, *parathion*, *phosphamidon*, *sulfotep*, *TEPP*, and preparations containing more than 10% of these substances.
- (b) Halogenated organic compounds, such as: *aldrin*, *dieldrin*, *heptachlor*, and preparations containing more than 10% of these substances.
- (c) Nitrated organic compounds, such as: *4,6-dinitrophenol*, *dinoseb*, *dinitrophenyl acetate*, *dinitro-o-cresol*, and preparations containing more than 50% of these substances.
- (d) Carbamates and derivatives of urea, such as: *ANTU*, *isolan*, and preparations containing more than 25% of these substances.
- (e) Alkaloids, such as: *nicotine*, *brucine*, *strychnite*, their salts, and preparations containing more than 10% of these substances.
- (f) Organic metal compounds, such as:
1. Organic *mercury compounds*, and preparations containing more than 5% of these substances;

2. *Trialkyl and triaryl compounds of tin*, and preparations containing more than 25% of these substances.
  - (g) Other organic compounds, such as: *coumachlor, sodium fluoroacetate, fluoroacetamide, pindone, warfarin*, and preparations containing more than 5% of these substances.
  - (h) Inorganic metal compounds, such as *thallium compounds*, and preparations containing more than 10% of these substances.
  - (i) Other inorganic compounds, such as compounds of arsenic and preparations containing more than 10% of these substances.
82. Substances and preparations presenting a risk of severe poisoning:
- (a) Organo-phosphorus compounds, such as:
    1. *Demeton-O+S-methyl, dioxathion, ethion, fenthion, phenkapton, thiometon*, and preparations containing more than 25% of these substances;
    2. *Preparations of azinphos-ethyl, azinphos-methyl, demeton-O+S, dimefox, endothon, HETP, mecarbam, parathion-methyl, mevinphos, parathion, phosphamidon, sulfotep and TEPP*, containing more than 2.5% but not more than 10% active substance.
  - (b) Halogenated organic compounds, such as:
    1. *Toxaphene, pentachlorophenol*, and preparations containing more than 20% of these substances;
    2. *Gamma-BHC (gammexane), DDT*, and preparations containing more than 50% of these substances.
  - (c) Nitrated organic compounds, such as:
    1. *Preparations of 4,6-dinitrophenol dinoseb, dinitrophenyl acetate and dinitro-o-cresol*, containing more than 10% but not more than 50% active substance;
    2. *Preparations of binapacryl*, containing more than 50% active substance.
  - (d) Carbamates and derivatives of urea, such as:
    1. *Dimetan, urbazid*, and preparations containing more than 25% of these substances;
    2. *Preparations of ANTU and isolan*, containing more than 5% but not more than 25% active substance.
  - (e) Preparations of alkaloids, such as: *preparations of nicotine, brucine and strychnine*, or their salts containing more than 2.5% but not more than 10% active substance.
  - (f) Preparations of organic metal compounds, such as:
    1. *Organic mercury preparations*, containing more than 1% but not more than 5% active substance;
    2. *Preparations of trialkyl and triaryl compounds of tin*, containing more than 5% but not more than 25% active substance.
  - (g) Preparations of other organic compounds, such as:
    1. *Preparations of coumachlor, sodium fluoroacetate, pindone and warfarin*, containing more than 1% but not more than 5% active substance;

2. *Preparations of fluoroacetamide*, containing not more than 5% active substance.
  - (h) Preparations of inorganic metal compounds, such as: *preparations of thallium compounds*, containing more than 2.5% but not more than 10% active substance.
  - (i) Preparations of other inorganic compounds, such as: *preparations of compounds of arsenic*, containing more than 2.5% but not more than 10% active substance.
83. Substances and preparations which are harmful:
- (a) Organo-phosphorus compounds, such as:
    1. *Diazinon, dimethoate, trichlorphon, malathion*, and preparations containing more than 5% of these substances;
    2. *Preparations of demeton-O+S-methyl, dioxathion, ethion, fen-thion, phenkapton and thiometon*, containing more than 2.5% but not more than 25% active substance;
    3. *Preparations of azinphos-ethyl, azinphos-methyl, demeton-O + S, dimefox, endothion, HETP, mecarbam, parathion-methyl, mevin-phos, parathion, phosphamidon, sulfotep and TEPP*, containing not more than 2.5% active substance.
  - (b) Preparations of halogenated organic compounds, such as:
    1. *Preparations of toxaphene and pentachlorophenol*, containing more than 5% but not more than 20% active substance;
    2. *Preparations of gamma-BHC* (preparations of gammexane) and *DDT* containing more than 10% but not more than 50% active substance;
    3. *Preparations of aldrin, dieldrin and heptachlor*, containing more than 2.5% but not more than 10% active substance.
  - (c) Preparations of nitrated organic compounds, such as:
    1. *Preparations of binapacryl*, containing more than 10% but not more than 50% active substance;
    2. *Preparations of 4,6-dinitrophenol, dinoseb, dinitrophenyl acetate and dinitro-o-cresol*, containing more than 2.5% but not more than 10% active substance.
  - (d) Preparations of carbamates and derivatives of urea, such as:
    1. *Preparations of ANTU and isolan*, containing more than 1% but not more than 5% active substance;
    2. *Preparations of dimetan and urbazid*, containing more than 2.5% but not more than 25% active substance.
  - (e) Preparations of alkaloids, such as: *preparations of nicotine, brucine and strychnine*, or their salts, containing not more than 2.5% active substance.
  - (f) Preparations of organic metal compounds, such as:
    1. *Preparations of organic mercury compounds*, containing not more than 1% active substance;
    2. *Preparations of trialkyl and triaryl compounds of tin*, containing more than 1% but not more than 5% active substance.

- (g) Preparations of other organic compounds, such as: *preparations of coumachlor, sodium fluoroacetate, pindone and warfarin*, containing not more than 1% active substance.
  - (h) Preparations of inorganic metal compounds, such as: *preparations of thallium compounds*, containing not more than 2.5% active substance.
  - (i) Preparations of other inorganic compounds, such as: *preparations of compounds of arsenic*, containing not more than 2.5% active substance.
84. (a) *Cereal grains* and other *seeds impregnated* with one or more pesticides or other poisonous substances of Class IV a, used as pesticides;
- (b) *Dressed seeds treated* with pesticides or other poisonous substances of Class IV a, but not used as pesticides.

#### K. EMPTY PACKAGINGS

91. *Empty packagings*, uncleaned, including receptacles of tank wagons and small tank containers and *empty bags*, uncleaned, which have contained substances of items 1 to 5, 11 to 14, 21 to 23, 31 to 33, 41, 51 to 54, 81 and 82.
92. *Empty packagings*, uncleaned, including receptacles of tank wagons and small containers, and *empty bags*, uncleaned, which have contained substances of items 61, 62, 71 to 75, 83 and 84.

NOTE re items 91 and 92. Empty packagings with residues from their previous contents adhering to the outside are not accepted for carriage.

### 2. Conditions of carriage

(The regulations relating to empty packagings are to be found under F.)

#### A. PACKAGES

##### 1. General conditions for packing

402 (1) Packagings shall be so closed and arranged as to prevent any loss of the contents. For the special regulation relating to substances of item 41, see marg. 418.

(2) The materials of which the packagings and their closures are made must not be liable to attack by the contents or form harmful or dangerous compounds therewith.

(3) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. In particular, where substances are in the liquid state or in solution, or have been wetted by a liquid, the receptacles and their closures must, unless the section headed "Packing of individual substances" provides otherwise, be able to withstand any pressure which, the presence of air also being taken into account, may arise inside the receptacles, in normal carriage. For this purpose a free space must be left, account being taken of the difference between the temperature of the substances at the time of filling and the highest mean temperature which they are likely to reach during carriage. Inner packagings shall be firmly secured in outer packagings. Unless otherwise specified in the section "Packing of individual substances", inner packagings may be enclosed in outer packagings, either singly or in groups.

(4) Bottles and other glass receptacles must be free from faults liable to impair their strength; in particular, internal stresses must have been suitably relieved. The thickness of the walls must be not less than 3 mm in the case of receptacles which, with their contents, weigh more than 35 kg, and not less than 2 mm in the case of other receptacles.

The tightness of the closure system must be ensured by an additional device (cap, crown, seal, binding, etc.) capable of preventing any loosening of the closure system during carriage, unless this closure consists of two stoppers, one on top of the other, one of them being screw-threaded.

(5) When receptacles made of glass, porcelain, stoneware or similar materials are prescribed or allowed, they must be secured by cushioning material in protective packagings. Cushioning material shall be suited to the nature of the contents; in particular, it shall be absorbent when the contents are liquid.

(6) When handed over for carriage, packages must not be contaminated on the outside by poisonous substances.

## 2. *Packing of individual substances*

403 (1) Hydrocyanic acid and inflammable volatile substances having a similar toxic effect [item 1 (a)] shall be packed:

(a) When completely absorbed by an inert porous material: in strong sheet-steel boxes, with a capacity of not more than 7.5 litres, entirely filled with the porous material, which must be of such a nature that it does not shake down or form dangerous spaces, even after prolonged use or under impact, at temperatures up to 50° C. The boxes must be able to withstand a pressure of 6 kg/cm<sup>2</sup> and must, when filled at 15° C, still be leakproof at 50° C. The date of filling shall be stamped on the lid of each box. The boxes shall be placed in packing cases with sides not less than 18 mm thick in such a manner that they cannot come into contact with one another. The total capacity of the boxes in one packing case must not exceed 120 litres and the package must not weigh more than 120 kg;

(b) When liquid but not absorbed by a porous material: in carbon-steel receptacles. These shall conform to the provisions relating to such receptacles in Class I d, marg. 141, 142 (1), 143, 145 and 148, with the following derogations and special requirements;

The internal pressure to be applied for the hydraulic pressure test must be 100 kg/cm<sup>2</sup>.

The pressure test shall be repeated every two years, when a meticulous inspection of the inside of the receptacle shall also be carried out and the receptacle's weight determined.

In addition to the marks prescribed in marg. 148 (1) (a) to (c) and (e) to (g), the receptacles must bear the date (month, year) of the most recent filling.

The maximum filling allowed for the receptacles is 0.55 kg liquid per litre of capacity.

(c) For the particulars in the consignment note, see marg. 434 (2).

(2) Aqueous solutions of hydrocyanic acid [item 1 (b)] shall be packed in flame-sealed glass ampoules containing not more than 50 g, or in glass-stoppered glass bottles so closed as to be leakproof and containing not more than 250 g. The ampoules and bottles shall be secured by absorbent cushioning material in soft-soldered tinplate boxes or in protective cases with a soft-soldered tinplate lining. A package comprising a tinplate box must not weigh more than 15 kg or contain more than 3 kg hydrocyanic acid solution; a package comprising a case must not weigh more than 75 kg.

(3) For the carriage in tank wagons of aqueous solutions of hydrocyanic acid [item 1 (b)], see marg. 438.

404 (1) Substances of item 2 shall be packed:

(a) 1. In sheet-steel canisters with walls not less than 1 mm thick and a capacity not exceeding 60 litres, the openings being closed by two plugs, one

placed over the other, one of them being screw-threaded. The sheet-steel canisters must have welded lengthwise seams, two reinforcing ribs in the walls, and a protective rim below the joint recessed at the bottom. Canisters with a capacity of 40 to 60 litres must have their bottoms welded on and be fitted with means of handling on the side; or

2. In all-welded steel drums with walls not less than 1.25 mm thick, fitted with rolling hoops and reinforcing ribs and having the openings closed by two plugs, one placed over the other, one of them being screw-threaded;

(b) Acrylonitrile may also be packed:

1. In aluminium bottles of a capacity not exceeding 2 litres, secured by infusorial-earth cushioning in sheet-metal receptacles whose lids shall be firmly stuck down by means of suitable adhesive strips. The sheet-metal receptacles shall be placed, with filling material, in wooden cases. A package must not weigh more than 75 kg; or
2. In one-trip metal drums (new packagings intended to be used only once); these drums, whose walls shall not be less than 1.2 mm thick, shall be provided with a screw-threaded plug fitted with a gasket. The plug shall be situated on one of the ends and be protected by the rim of the drum. The drums may have a body with ends recessed, the joints being strengthened by chime reinforcements; if they do not possess rolling hoops they must be provided with reinforcing ribs. A package must not weigh more than 200 kg. Carriage in one-trip drums shall take place only as a full load in open wagons; or
3. In one-trip steel drums (new packagings intended to be used only once) having sides made of sheet steel 1.24 mm thick, ends made of sheet steel 1.5 mm thick, and a tare weight of 22.5 kg; the drums must be provided with reinforcing ribs. The body seam shall be welded and the ends shall be double-seamed by welting to the body, with a polyethylene liner inserted. Two screw-plug closure units, one of 50.8 mm (2") and one of 19.05 mm (3/4"), shall be double-seamed by welting to one of the ends, with a synthetic-rubber liner inserted. Thin sheet-steel caps shall be placed over the closure units;

(c) Acetonitrile may also be packed in receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, of a capacity not exceeding 1 litre, with the openings closed by two plugs, one placed over the other, one of them being screw-threaded. These receptacles shall be secured by absorbent cushioning material in a wooden case or some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling.

(2) Receptacles containing acrylonitrile or acetonitrile must not be filled beyond 93%, and receptacles containing isobutyronitrile not beyond 92%, of their capacity.

(3) For the carriage in tank wagons of acrylonitrile and acetonitrile [item 2 (a) and (b)], see marg. 438.

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(1) Substances of item 3 shall be packed in receptacles made of sheet-steel of sufficient thickness, which shall be closed by a screw-threaded bung or plug rendered leakproof both to liquid and to vapour by means of a suitable gasket. The receptacles must be capable of withstanding an internal pressure of 3 kg/cm<sup>2</sup>. Each receptacle shall be secured by absorbent cushioning material in a strong and leakproof protective metal packaging. The protective packaging shall be hermetically closed and its closure shall be secured against any inadvertent



opening. The degree of filling shall not exceed 0.67 kg per litre of capacity of the receptacle.

(2) A package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling.

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(1) Substances of item 4 shall be packed:

- (a) In receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, of a capacity not exceeding 5 litres, with the openings closed by two plugs, one placed over the other, one of them being screw-threaded. These receptacles shall be secured by absorbent cushioning material in a wooden case or some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 93% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In flame-sealed glass ampoules containing not more than 100 g, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The ampoules must not be filled beyond 93% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (c) In metal receptacles having, if necessary, a suitable lining, the receptacles having a capacity not exceeding 15 litres and having the openings closed by two plugs, one placed over the other, one of them being screw-threaded. These receptacles shall be secured by absorbent cushioning material, in a wooden case or some other outer packaging of sufficient strength. The receptacles must not be filled beyond 93% of their capacity. Such a package must not weigh more than 100 kg; or
- (d) In welded metal drums having, if necessary, a suitable lining, the drums having the openings closed by two plugs, one placed over the other, one of them being screw-threaded. The drums must not be filled beyond 93% of their capacity. If, with their contents, they weigh more than 275 kg, they shall be equipped with rolling hoops.

(2) For the carriage in tank wagons of allyl chloride of item 4 (a), see marg. 438.

407

(1) Substances of item 5 shall be packed in metal receptacles. The receptacles must be fitted with completely leakproof closing devices, which shall be secured against mechanical damage by protective caps. Steel receptacles must have walls not less than 3 mm thick and receptacles made of other materials must have walls at least thick enough to ensure equivalent mechanical strength. A package must not contain more than 25 kg of liquid. The maximum filling allowed shall be 1 kg of liquid per litre of capacity.

(2) Receptacles shall be tested before being put into service for the first time. The test pressure to be applied for the hydraulic-pressure test shall be not less than 10 kg/cm<sup>2</sup>. The pressure test shall be repeated every five years and shall include a meticulous inspection of the inside of the receptacle and a check of the tare. Metal receptacles shall bear the following particulars in clearly legible and indelible characters:

- (a) The name of the product in full (the names of both substances may also be shown side by side);
- (b) The name of the owner of the receptacle;

- (c) The tare of the receptacle, including such fittings and accessories as valves, protective caps, etc.;
- (d) The date (month, year) of the acceptance test and the subsequent tests and the expert's stamp;
- (e) The maximum permissible filling per receptacle in kg;
- (f) The internal pressure (test pressure) to be applied for the hydraulic-pressure test.

408

(1) Substances of item 11 (a) shall be packed:

- (a) In sheet-steel canisters with walls not less than 1 mm thick and a capacity not exceeding 60 litres, the openings being closed by two plugs, one placed over the other, one of them being screw-threaded. The sheet-steel canisters must have welded lengthwise seams, two reinforcing ribs in the walls, and a protective rim below the joint recessed at the bottom. Canisters with a capacity of 40 to 60 litres must have their bottoms welded on and be fitted with means of handling on the side; or
- (b) In all-welded steel drums with walls not less than 1.25 mm thick, fitted with rolling hoops and reinforcing ribs and having the openings closed by two plugs, one placed over the other, one of them being screw-threaded.

(2) Substances of item 11 (b) shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In metal receptacles having, if necessary, a suitable lining, the receptacles having a capacity not exceeding 15 litres and having the openings closed by two plugs, one placed over the other, one of them being screw-threaded. These receptacles shall be secured by absorbent cushioning material in a wooden case or some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (c) In hermetically closed metal drums having, if necessary, a suitable lining. The drums must not be filled beyond 95% of their capacity. If, with their contents, they weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (d) In hermetically closed wooden casks of sufficient strength, with a suitable lining. Such a package must not weigh more than 250 kg.

(3) For the carriage in tank wagons of 2-cyanopropan-2-ol of item 11 (a), and in tank wagons and small tank containers of aniline of item 11 (b), see marg. 438 and marg. 439 (4).

409

(1) Substances of item 12 (a) and (b) shall be packed:

- (a) Not more than 5 litres per bottle, in glass bottles placed separately, with absorbent materials, in a strong tinplate receptacle; in the case of 1-chloro-2,3-epoxypropane, black sheet-iron may be used instead of tinplate. The receptacles shall be secured by absorbent cushioning material in a wooden packing case. A package must not weigh more than 75 kg; or
- (b) Not more than 5 litres per receptacle, in receptacles, made of stout tinplate, with leakproof closures; in the case of 1-chloro-2,3-epoxypropane black

sheet-iron may be used instead of tinfoil. The receptacles shall be secured by absorbent cushioning material or wood-wool cushioning in a wooden packing case. A package must not weigh more than 75 kg; or

- (c) In welded steel drums with the openings closed by two plugs, one placed over the other, one of them being screw-threaded, the drums being fitted with rolling hoops. In the case of 2-chloroethanol it is also permissible to use welded canisters with the openings closed by two plugs, one placed over the other, one of them being screw-threaded, the canisters being fitted with means of handling, being made of sheet steel 1 mm thick galvanized on both sides, and having a capacity not exceeding 60 litres;
- (d) The receptacles must not be filled beyond 93% of their capacity.

(2) Substances of item 12 (c) shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware, or similar materials, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In flame-sealed glass ampoules containing not more than 100 g, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The ampoule must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (c) In hermetically closed canisters made of a suitable metal, welded or hard-soldered, having a capacity not exceeding 60 litres, and fitted with means of handling. The canisters must not be filled beyond 95% of their capacity; or
- (d) In hermetically closed metal drums having, if necessary, a suitable inner lining. The drums must not be filled beyond 95% of their capacity. If they weigh, with their contents, more than 275 kg, they shall be fitted with rolling hoops.

(3) Substances of item 12 (d) and (e) shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In flame-sealed glass ampoules containing not more than 100 g, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The ampoules must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (c) In hermetically closed metal receptacles having, if necessary, a suitable lining, and having a capacity not exceeding 15 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some

other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or

- (d) In hermetically closed metal drums having, if necessary, a suitable lining. The drums must not be filled beyond 95% of their capacity. If they weigh, with their contents, more than 275 kg, they shall be fitted with rolling hoops.

(4) Substances of item 12 (e) may also be packed in hermetically closed canisters made of a suitable metal, welded or hard-soldered, having a capacity not exceeding 60 litres, and fitted with means of handling. The canisters must not be filled beyond 95% of their capacity.

(5) Substances of item 12 (f) shall be packed:

- (a) In hermetically closed metal receptacles having, if necessary, a suitable lining, and having a capacity not exceeding 15 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 93% of their capacity. Such a package must not weigh more than 100 kg; or
- (b) In hermetically closed canisters made of a suitable metal, welded or hard-soldered, having a capacity not exceeding 60 litres, and fitted with means of handling. The canisters must not be filled beyond 93% of their capacity; or
- (c) In hermetically closed metal drums having, if necessary, a suitable lining. The drums must not be filled beyond 93% of their capacity. If they weigh, with their contents, more than 275 kg, they shall be fitted with rolling hoops.

(6) For the carriage in tank wagons of 1-chloro-2,3-epoxypropane and 2-chloroethanol [item 12 (a) and (b)], see marg. 438.

410

(1) Substances of item 13 (a) and (b) shall be packed:

- (a) In flame-sealed glass ampoules or in hermetically closed glass bottles; for this purpose a stopper made of cork coated with paraffin wax, or a ground-glass stopper, may be used. The ampoules and bottles must not be filled beyond 93% of their capacity and must not weigh, with their contents, more than 3 kg. They shall be wrapped in corrugated fibreboard and secured by a sufficient quantity of inert and absorbent cushioning material (infusorial earth or similar materials) in soft-soldered tins or in wooden cases lined with a tinplate lining assembled by soft soldering. A package comprising a tinplate box must not weigh more than 15 kg and a package comprising a wooden case not more than 75 kg; or
- (b) In soldered or seamless sheet-metal receptacles or in receptacles made of a suitable plastics material. These receptacles shall be hermetically closed; they must not be filled beyond 93% of their capacity and must not weigh, with their contents, more than 50 kg; if they are made of thin sheet-metal, e.g. tinplate, they must not weigh, with their contents, more than 6 kg. The sheet-metal or plastics receptacles shall be secured by a sufficient quantity of inert and absorbent cushioning material (e.g. infusorial earth or similar materials) in protective receptacles fitted with means of handling. Such a package must not weigh more than 100 kg; or
- (c) In hermetically closed welded or seamless metal drums fitted with end bands and rolling hoops and not filled beyond 93% of their capacity.

(2) Substances of item 13 (c) shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, which must not contain more than 5 kg each. Receptacles made of plastics material may, if forwarded

as a full load, contain up to 10 kg of substance. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or

- (b) In hermetically closed metal receptacles having, if necessary, a suitable lining and which must not contain more than 15 kg each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 100 kg; or
- (c) In hermetically closed metal drums having, if necessary, a suitable lining. If the drums, with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (d) In hermetically closed wooden casks of sufficient strength, with a suitable lining. Such a package must not weigh more than 250 kg; or
- (e) In bags made of a suitable plastics material, so closed as to be leakproof, and placed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg.

(3) For the carriage in tank wagons of allyl alcohol, dimethyl sulphate and phenol [item 13 (a), (b) and (c)], see marg. 438.

411

(1) Substances of item 14 shall be packed:

- (a) In welded steel drums with openings closed by two plugs, one placed over the other, one of them being screw-threaded, the drums being fitted with rolling hoops. The drums must not be filled beyond 95% of their capacity; or
- (b) In receptacles made of strong black sheet-iron or of tinplate and hermetically closed. A tinplate receptacle must not, with its contents, weigh more than 6 kg. These receptacles shall be secured by absorbent cushioning material in a wooden packing case. Such a package must not weigh more than 75 kg.

(2) For carriages in tank wagons, see marg. 438.

412

(1) Substances of items 21 (a), (b), (c) and (d), and liquids of item 21 (e) and (f), shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In flame-sealed glass ampoules containing not more than 100 g, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The ampoules must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (c) In hermetically closed metal receptacles having, if necessary, a suitable lining, and having a capacity not exceeding 15 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or

(d) In hermetically closed metal drums having, if necessary, a suitable lining. The drums must not be filled beyond 95% of their capacity. If they weigh, with their contents, more than 275 kg, they shall be fitted with rolling hoops.

(2) Substances of item 21 (b), (c) and (d) and liquids of item 21 (e) and (f) may also be packed in hermetically closed canisters made of a suitable metal, welded or hard-soldered, having a capacity not exceeding 60 litres, and fitted with means of handling. The canisters must not be filled beyond 95% of their capacity.

(3) Substances of item 21 (e) and (f) in the solid state, and substances of item 21 (g), (h), (i) and (k), shall be packed:

(a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, which must not contain more than 5 kg each. Receptacles made of plastics material may, if forwarded as a full load, contain up to 10 kg of substance. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or

(b) In hermetically closed metal receptacles having, if necessary, a suitable lining and which must not contain more than 15 kg each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 100 kg; or

(c) In hermetically closed metal drums having, if necessary, a suitable lining. If the drums weigh, with their contents, more than 275 kg, they shall be fitted with rolling hoops.

(4) Substances of item 21 (e) and (f) in the solid state, and substances of item 21 (g) and (h), may also be packed:

(a) In bags made of a suitable plastics material, so closed as to be leakproof, and placed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or

(b) In hermetically closed wooden casks of sufficient strength, with a suitable lining. Such a package must not weigh more than 250 kg.

(5) Substances of item 21 (g) may also be packed in hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. Those receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength.

(6) Substances of item 21 (l), (m), (n), (o) and (p) shall be packed:

(a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or

(b) In flame-sealed glass ampoules containing not more than 100 g, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The ampoules must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or

- (c) In hermetically closed metal receptacles having, if necessary, a suitable lining, and having a capacity not exceeding 15 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (d) In hermetically closed canisters made of a suitable metal, welded or hard-soldered, having a capacity not exceeding 60 litres, and fitted with means of handling. The canisters must not be filled beyond 95% of their capacity; or
- (e) In hermetically closed metal drums having, if necessary, a suitable lining. The drums must not be filled beyond 95% of their capacity. If they weigh, with their contents, more than 275 kg, they shall be fitted with rolling hoops.
  - (7) 4-nitrotoluene [item 21 (1)] may also be packed:
    - (a) In bags made of a suitable plastics material, so closed as to be leakproof, and placed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
    - (b) In hermetically closed wooden casks of sufficient strength, with a suitable lining. Such a package must not weigh more than 250 kg; or
    - (c) In bags made of stout paper of four plies, lined with a bag made of a suitable plastics material, so closed as to be leakproof. Such a package must not weigh more than 55 kg.

(8) Substances of item 21 (o) in flakes may also be packed in bags made of stout paper of four plies, lined with a bag made of a suitable plastics material and so closed as to be leakproof. Such a package must not weigh more than 55 kg.

413

(1) Substances of item 22 shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, which must not contain more than 5 kg each. Receptacles made of plastics material may, if forwarded as a full load, contain up to 10 kg of substance. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
- (b) In hermetically closed metal receptacles having, if necessary, a suitable lining and which must not contain more than 15 kg each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 100 kg; or
- (c) In hermetically closed metal drums having, if necessary, a suitable lining. If the drums, with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (d) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength; or
- (e) In bags made of a suitable plastics material, so closed as to be leakproof, and placed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
- (f) In hermetically closed wooden casks of sufficient strength, with a suitable lining. Such a package must not weigh more than 250 kg.

(2) For the carriage in tank wagons of cresols and xylenols of item 22 (a) and (b), see marg. 438.

414

(1) Liquids of item 23 shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or,
- (b) In flame-sealed glass ampoules containing not more than 100 g, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The ampoules must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (c) In hermetically closed metal receptacles having, if necessary, a suitable lining, and having a capacity not exceeding 15 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (d) In hermetically closed metal drums having, if necessary, a suitable lining. The drums must not be filled beyond 95% of their capacity. If they weigh, with their contents, more than 275 kg, they shall be fitted with rolling hoops.

(2) Solids of item 23 shall be packed in the same way as substances of item 22.

415

(1) Substances of item 31 (a) and solid preparations of item 31 (c) shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, which must not contain more than 5 kg each. Receptacles made of plastics material may, if forwarded as a full load, contain up to 10 kg of substance. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
- (b) In hermetically closed metal receptacles having, if necessary, a suitable lining and which must not contain more than 15 kg each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 100 kg; or
- (c) In hermetically closed metal drums having, if necessary, a suitable lining. If the drums, with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (d) In hermetically closed receptacles, made of a suitable plastics material of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paper-board or of some other material of sufficient strength; or
- (e) In hermetically closed wooden casks of sufficient strength, with a suitable lining. Such a package must not weigh more than 250 kg.



(2) Substances of item 31 (b) and liquid preparations of item 31 (c) shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In flame-sealed glass ampoules containing not more than 100 g, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The ampoules must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (c) In hermetically closed metal receptacles having, if necessary, a suitable lining, and having a capacity not exceeding 15 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (d) In hermetically closed canisters made of a suitable metal, welded or hard-soldered, having a capacity not exceeding 60 litres, and fitted with means of handling. The canisters must not be filled beyond 95% of their capacity; or
- (e) In hermetically closed metal drums having, if necessary, a suitable lining. The drums must not be filled beyond 95% of their capacity. If the drums, with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops.

(3) For the carriage in tank wagons of substances of item 31 (b), see marg. 438.

**416** (1) Sodium azide [item 32 (a)] shall be packed in receptacles made of black sheet-iron or tinplate.

(2) Substances of item 32 (b) shall be packed in receptacles made of glass or of a suitable plastics material. A receptacle must not contain more than 10 kg of barium azide nor more than 20 litres of barium azide solution. The receptacles shall be secured separately, by absorbent cushioning material, in cases or in iron hampers with complete sides; the volume of the cushioning material must be at least equal to that of the content of the receptacle. Where hampers are used, the cushioning material, if readily inflammable, shall be fireproofed sufficiently to prevent ignition on contact with a flame.

**417** Zinc phosphide (item 33) shall be packed in metal receptacles secured in wooden cases. A package must not weigh more than 75 kg.

**418** (1) Substances of item 41 shall be enclosed in wooden or metal packagings which may be fitted with a device allowing gases to escape. Finely granulated substances may also be packed in bags.

(2) Substances of item 41 may also be forwarded in bulk, in conformity with marg. 437 (1) and marg. 439 (3).

**419** Substances of item 51 shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, which must not contain

more than 5 kg each. Receptacles made of plastics material may, if forwarded as a full load, contain up to 10 kg of substance. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or

- (b) In hermetically closed metal receptacles having, if necessary, a suitable lining and which must not contain more than 15 kg each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 100 kg; or
- (c) In hermetically closed metal drums having, if necessary, a suitable lining. If the drums with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (d) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength; or
- (e) In bags made of a suitable plastics material, so closed as to be leakproof, which shall be placed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
- (f) In hermetically closed wooden casks of sufficient strength, with a suitable lining. Such a package must not weigh more than 250 kg.

420

(1) Substances of item 52 shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware, or similar materials, or of a suitable plastics material, which must not contain more than 5 kg each; receptacles made of plastics material may, if forwarded as a full load, contain up to 10 kg of substance. The receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
- (b) In hermetically closed metal receptacles having, if necessary, a suitable lining and which must not contain more than 15 kg each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 100 kg; or
- (c) In hermetically closed metal drums having, if necessary, a suitable lining. If the drums, with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (d) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength; or
- (e) In bags made of a suitable plastics material, so closed as to be leakproof, which shall be placed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
- (f) In receptacles made of wood or paperboard, lined with a vapour-tight plastics material and hermetically closed. Such a package must not weigh more than 75 kg; or
- (g) In hermetically closed metal receptacles. Such a package must not weigh more than 75 kg.

(2) When forwarded as a full load, the substances may also be packed:

- (a) In hermetically closed wooden casks of sufficient strength, with a suitable lining. Such a package must not weigh more than 250 kg; or
- (b) In bags made of stout paper of four plies, lined with a bag made of a suitable plastics material, so closed as to be leakproof. Such a package must not weigh more than 55 kg.

421

(1) Solids of item 53 shall be packed:

- (a) Not more than 10 kg per bag, in bags made of paper of two plies; or
- (b) In bags made of a suitable plastics material, or
- (c) In receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material; or
- (d) In steel receptacles or in strong wooden casks or in wooden cases fitted with strengthening bands.

Re (a), (b) and (c): The receptacles and bags shall be secured by cushioning material in wooden outer packagings.

(2) Liquids or substances in solution of item 53 shall be packed:

- (a) In receptacles made of glass, porcelain, stoneware or similar materials. These receptacles shall be secured by cushioning material in protective packagings which, if not cases, shall be fitted with means of handling; or
- (b) In metal receptacles.

(3) A package containing fragile receptacles or bags made of a plastics material must not weigh more than 75 kg.

422

Thallium compounds (item 54) shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, which must not contain more than 5 kg each. Receptacles made of plastics material may, if forwarded as a full load, contain up to 10 kg of substance. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
- (b) In tinsplate receptacles; or
- (c) In wooden cases fitted with strengthening bands; or
- (d) In wooden casks fitted with iron hoops or strong wooden hoops.

423

(1) Substances of items 61 and 62, other than those of item 61 (1), shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In flame-sealed glass ampoules containing not more than 100 g, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The ampoules must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg.

Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or

- (c) In hermetically closed metal receptacles having, if necessary, a suitable lining, and having a capacity not exceeding 15 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (d) In hermetically closed canisters made of a suitable metal, welded or hard-soldered, having a capacity not exceeding 60 litres, and fitted with means of handling. The canisters must not be filled beyond 95% of their capacity; or
- (e) In hermetically closed metal drums having, if necessary, a suitable lining. The drums must not be filled beyond 95% of their capacity. If the drums, with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (f) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength. The receptacles must not be filled beyond 95% of their capacity.

(2) Substances of item 61 (1) shall be packed:

- (a) In all-welded steel drums with walls not less than 1.25 mm thick, fitted with rolling hoops and reinforcing ribs and having the openings closed by two plugs, one placed over the other, one of them being screw-threaded; or
- (b) In sheet-steel canisters with walls not less than 1 mm thick and a capacity not exceeding 60 litres, the openings being closed by two plugs, one placed over the other, one of them being screw-threaded. The sheet-steel canisters must have welded lengthwise seams, two reinforcing ribs in the walls, and a protective rim below the joint recessed at the bottom. Canisters with a capacity of 40 to 60 litres must have their bottoms welded on and be fitted with means of handling on the side; or
- (c) In aluminium bottles of a capacity not exceeding 2 litres, secured by infusorial-earth cushioning in sheet-metal receptacles whose lids shall be firmly stuck down by means of suitable adhesive strips. The sheet-metal receptacles shall be placed, with filling materials, in wooden cases. A package must not weigh more than 75 kg; or
- (d) In one-trip metal drums (new packagings intended to be used only once); these drums, whose walls shall be not less than 1.2 mm thick, shall be provided with a screw-threaded plug fitted with a gasket. The plug shall be situated in one of the ends of the drum and be protected by the rim. The drums may have a body with ends recessed, the joints being strengthened by chimb reinforcements; if they do not possess rolling hoops they must be provided with reinforcing ribs. A package must not weigh more than 200 kg. Carriage in one-trip drums shall take place only as a full load in open wagons; or
- (e) In one-trip steel drums (new packagings intended to be used only once) having sides made of sheet steel 1.24 mm thick, ends made of sheet steel 1.5 mm thick, and a tare weight of 22.5 kg; the drums must be provided with reinforcing ribs. The body seam shall be welded and the ends shall be double-seamed by welting to the body, with a polyethylene liner inserted. Two screw-plug closure units, one of 50.8 mm (2") and one of 19.05 mm (3/4"), shall be double-seamed by welting to one of the ends, with a synthetic-rubber liner inserted. Thin sheet-steel caps shall be placed over the closure units.

(3) The receptacles referred to under (2) (a) to (e) must not be filled beyond 93% of their capacity.

424 Substances of item 71 shall be packed:

- (a) In iron or wooden packagings; or
- (b) In bags made of stout paper of at least two plies, or made of jute, lined with a bag made of a suitable plastics material, so closed as to be leakproof.

425 (1) Substances of items 72 and 73 shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, which must not contain more than 5 kg each. Receptacles made of plastics material may, if forwarded as a full load, contain up to 10 kg of substance. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
- (b) In steel or wooden packagings; or
- (c) In bags made of stout paper of at least two plies. However, bags for lead acetate must be made:
  - 1. Of hemp lined with a suitable plastics material or with stout crepe paper stuck on with bitumen; such a bag, with its contents, must not weigh more than 30 kg; or
  - 2. Of stout paper of at least two plies, lined with a bag made of a suitable plastics material; such a bag, with its contents, must not weigh more than 30 kg; or
  - 3. Of stout paper of at least five plies, lined with a bag made of a suitable plastics material; such a bag, with its contents, must not weigh more than 55 kg; or
  - 4. Of stout paper of at least three plies, placed in jute bags; such a bag, with its contents, must not weigh more than 55 kg; or
- (d) In bags made of a suitable plastics material, so closed as to be leakproof, which shall be placed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg.

(2) Substances of item 72 may also be packed in receptacles made of tinplate or of sheet steel.

(3) Substances of item 73 may also be forwarded in bulk, in conformity with marg. 437 (2) and marg. 439 (3).

426 Substances of items 74 and 75 shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, which must not contain more than 5 kg each. Receptacles made of plastics material may, if forwarded as a full load, contain up to 10 kg of substance. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
- (b) In steel or wooden packagings; or
- (c) In bags made of stout paper of at least two plies, or in jute bags; or
- (d) In receptacles made of tinplate or sheet steel.

427

(1) Pesticides of item 81 shall be packed:

(a) In solid or paste form:

1. In hermetically closed receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, which must not contain more than 5 kg each. Receptacles made of plastics material may, if forwarded as a full load, contain up to 10 kg of substance. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
2. In hermetically closed metal receptacles having, if necessary, a suitable lining and which must not contain more than 15 kg each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 100 kg; or
3. In hermetically closed metal drums having, if necessary, a suitable lining. If the drums, with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops; or
4. In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength; or
5. In bags made of a suitable plastics material, so closed as to be leakproof, which shall be placed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
6. In receptacles made of wood or paperboard, lined with a vapour-tight plastics material and hermetically closed. Such a package must not weigh more than 75 kg; or
7. In hermetically closed metal receptacles. Such a package must not weigh more than 75 kg;
8. Arsenical compounds forwarded as a full load may also be packed in hermetically closed wooden casks of sufficient strength, with a suitable lining. Such a package must not weigh more than 250 kg;
9. Preparations may also be enclosed in packagings ready for use, which shall be firmly packed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg;

(b) In liquid form:

1. In receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, of a capacity not exceeding 5 litres, with the openings closed by two plugs, one placed over the other, one of them being screw-threaded. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 93% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
2. In flame-sealed glass ampoules containing not more than 50 g, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The ampoules must not be filled beyond 93% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or

3. In metal receptacles having, if necessary, a suitable lining, the receptacles having a capacity not exceeding 15 litres and having the openings closed by two plugs, one placed over the other, one of them being screw-threaded. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 93% of their capacity. Such a package must not weigh more than 100 kg; or
  4. In canisters made of a suitable metal, welded or hard-soldered, with walls not less than 0.5 mm thick and a capacity not exceeding 60 litres, the openings being closed by two plugs, one placed over the other, one of them being screw-threaded, the canisters being fitted with means of handling. The canisters must not be filled beyond 93% of their capacity; or
  5. In hermetically closed metal drums having, if necessary, a suitable lining. If the drums, with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops. The drums must not be filled beyond 93% of their capacity; or
  6. In receptacles made of a suitable plastics material, of a capacity not exceeding 60 litres, the openings being closed by two plugs, one placed over the other, one of them being screw-threaded. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength. The receptacles must not be filled beyond 93% of their capacity.
- (2) For the carriage in tank wagons of liquids of item 81, see marg. 438.
- 428 (1) Pesticides of item 82 shall be packed:
- (a) In solid form:
1. In the same way as solids of item 81;
  2. When forwarded as a full load, also in bags made of stout paper of four plies, lined with a bag made of a suitable plastics material, so closed as to be leakproof. Such a package must not weigh more than 55 kg;
- (b) In liquid form:
- In the same way as liquids of item 81.
- (2) For the carriage in tank wagons of liquids of item 82, see marg. 438.
- 429 (1) Pesticides of item 83 shall be packed:
- (a) In solid form:
1. In the same way as solids of item 81; or
  2. In jute bags rendered impermeable to moisture by a lining made of a suitable material, stuck on with bitumen, or in jute bags lined with a bag made of a suitable plastics material, so closed as to be leakproof. Such a package must not weigh more than 55 kg; or
  3. In the case of preparations, and of other pesticides if they are forwarded as a full load, in bags made of stout paper of four plies, lined with a bag made of a suitable plastics material and hermetically closed. Such a package must not weigh more than 55 kg; or
  4. In the case of solid arsenical compounds:
    - i. In double-walled wooden casks lined with stout paper; or
    - ii. In fibreboard boxes placed in a wooden case; or
    - iii. Not more than 12.5 kg per bag, in double bags, made of stout paper or of a suitable plastics material, which shall be placed either in a

wooden case lined with stout paper or tightly in a stout case made of double-faced corrugated fibreboard or of solid fibreboard of equivalent strength, the case being lined with stout paper. All joints and flaps shall be covered over with adhesive strips. A package comprising a fibreboard case must not weigh more than 30 kg.

5. In the case of arsenical compounds forwarded as a full load:
  - i. In ordinary wooden packagings lined with stout paper; or
  - ii. Not more than 25 kg per bag, in two-ply paper bags, or in bags made of a suitable plastics material, which shall be placed separately in bags made of jute or of a similar material lined with crepe paper; or
  - iii. In bags made of paper of at least three plies or in two-ply paper bags lined with a bag made of a suitable plastics material. Such a package must not weigh more than 20 kg; or
  - iv. In two-ply paper bags or in bags made of a suitable plastics material, which shall be placed in four-ply paper bags. Such a package must not weigh more than 60 kg.

In cases as referred to under iii. and iv. above, each consignment must be accompanied by empty bags in the proportion of 1 for every 20 bags containing arsenical substances, these empty bags being intended to accommodate such quantity of substances as may escape from bags damaged during carriage.

(b) In liquid form:

1. In the same way as liquids of item 81; or
2. In the case of preparations:
  - i. In hermetically closed cylindrical receptacles made of glass, porcelain, stoneware or similar materials, of a capacity not exceeding 25 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg; or
  - ii. In hermetically closed glass carboys, of a capacity not exceeding 25 litres, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength, or which shall be well secured in iron or wicker hampers. The carboys must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg; or
  - iii. In receptacles, made of a suitable plastics material, with walls not less than 4 mm thick and a capacity not exceeding 60 litres, the openings being closed by two plugs, one placed over the other, one of them being screw-threaded, the receptacles having no protective packaging if the competent authority of the country of departure so allows. The receptacles must not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg.

(2) For the carriage in tank wagons of liquids of item 83, see marg. 438.

430

Substances of item 84 shall be packed:

- (a) In the same way as solids of item 81; or
- (b) In the case of substances of item 84 (a), if they are very conspicuously coloured, also in bags made of paper of at least two plies, or of a suitable plastics material, which shall be placed in textile bags; or



(c) In the case of substances of item 84 (b), in closely-woven jute bags.

### 3. Mixed packaging

431

(1) Substances listed under the same item may be packed together in the same package. The inner packagings shall conform to the requirements prescribed for each substance, and the outer packaging shall be that laid down for the substances of the item in question.

(2) If smaller quantities are not prescribed in the section "Packing of individual substances", and if special conditions are not set out below, the substances of this Class, in quantities not exceeding 6 kg in the case of solid substances or 3 litres in the case of liquid substances for the total amount of substances listed under the same item or the same letter, may be placed together in the same package either with the substances of another item or another letter of the same Class or with substances or articles belonging to other Classes—as long as mixed packing is also permitted for these—or with other goods.

The inner packagings must comply with the general and special conditions of packing. In addition, the general regulations of marg. 4 (6) and 8 must be observed.

A package must not weigh more than 150 kg, or more than 75 kg if it contains fragile receptacles.

#### Special conditions:

Item	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
1 (a)	Hydrocyanic acid	Mixed packing not allowed		
1 (b)	Solutions of hydrocyanic acid containing not more than 4% hydrocyanic acid (solutions containing more than 4% are prohibited)	1 litre	1 litre	Must not be packed together with any other acid.
2	Acrylonitrile, acetonitrile, isobutyronitrile	1 litre	1 litre	Must not be packed together with substances of Classes III c and V. Glass receptacles must be secured by cushioning material in protective receptacles.
5 (a)	Nickel carbonyl	Mixed packing not allowed		
11 (a)	2-cyanopropan-2-ol	1 litre	1 litre	Must not be packed together with substances of Classes III c and V. Glass receptacles must be secured by cushioning material in protective receptacles.

Item	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
13 (b)	Dimethyl sulphate	1 litre	3 litres	
31 (a)	Cyanides in a solid form —In fragile receptacles —In other receptacles	500 g 5 kg	500 g 5 kg	Must not be packed together with substances of an acid nature.
31 (b)	Solutions of inorganic cyanides	1 litre	3 litres	
41 (b)	Ferro-silicon alloys with aluminium	2.5 kg	2.5 kg	

#### 4. Marking and danger labels on packages (see Appendix IX)

432 (1) Every package containing substances of items 1 to 5, 11 to 14, 21 to 23, 31 to 33, 41, 51 to 54, 81 and 82 shall bear a label conforming to model No. 4; packages containing substances of items 2, 4 (a), 5 and 11 (a) shall bear, in addition, a label conforming to model No. 2. Every package containing substances of items 61, 62, 71 to 75, 83 and 84 shall bear a label conforming to model No. 4A.

(2) Packages containing fragile receptacles not visible from the outside shall bear a label conforming to model No. 9. If the fragile receptacles contain liquids, the packages shall in addition, except in the case of sealed ampoules, bear labels conforming to model No. 8; these labels shall be affixed high up on two opposite sides of cases or in an equivalent manner when other packagings are used.

(3) In the case of consignments forwarded as a full wagon load, labels Nos. 2, 4 or 4A need not be affixed to the packages (see also marg. 440).

#### B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

433 (1) Ethyleneimine (item 3) may not be forwarded by *grande vitesse* otherwise than in full wagon loads.

(2) Pesticides in solid or paste form (items 81 to 84) in commercial packagings ready for use [see marg. 427 (1) (a) 9] may be sent as express parcels. A package must not weigh more than 15 kg.

#### C. PARTICULARS IN THE CONSIGNMENT NOTE

434 (1) In the case of substances which are referred to by name in the list of substances (marg. 401), the description of the goods in the consignment note must conform to the name printed in *italics*. The description of the goods must be underlined in red and followed by *particulars of the class, the item number (together with the letter, if any), and the initials "RID"* [e.g. *IV a, item 1(a), RID*].

In the case of substances which are not referred to by name in the list of substances (marg. 401), the trade name or the chemical name must be used. This description must be underlined in red and followed by *particulars of the class, the item number (together with the letter, if any), of the substance presenting a comparable degree of danger, and the initials "RID"* [e.g. *IV a, item 21 (m), RID*].

(2) In the case of hydrocyanic acid [item 1 (a)], the sender must certify as follows in the consignment note: "*The nature of the goods and the packaging are in conformity with the provisions of RID*".

(3) In the case of substances of item 41, the sender must certify as follows in the consignment note: "*Stored in a dry place open to the air for at least three days*".

(4) In the case of consignments of substances which polymerise easily, the sender must certify as follows in the consignment note: "*The necessary steps have been taken to prevent polymerisation during carriage*".

#### D. TRANSPORT EQUIPMENT

##### 1. Conditions relating to wagons and their loading

###### a. For packages

435 (1) Open wagons containing hydrocyanic acid [item 1 (a)] shall be sheeted from April to October inclusive unless the receptacles are packed in wooden cases.

(2) Substances of item 54, pesticides of item 83, packed in conformity with marg. 429 (1) (a) 5.iii. and iv., and substances of item 84, packed in bags, shall be loaded in covered wagons. Wagons which have contained arsenical substances shall be carefully cleaned after unloading.

(3) Substances of item 3, 4 and 12 (a) and (b) shall be loaded in open wagons. Packing cases containing substances of items 4 and 12 (a) and (b) may also be loaded in covered wagons.

436 Substances of this Class shall be kept apart in wagons from foodstuffs or other articles for consumption.

###### b. For carriage in bulk

437 (1) Substances of item 41 in bulk shall be loaded in sheeted open wagons or in covered wagons.

(2) Substances of item 73 in bulk shall be loaded in sheeted open wagons or open wagons with movable covers.

(3) Wagons in which substances of items 41 and 73 have been carried in bulk must be thoroughly washed out after unloading.

###### c. For tank wagons

438 (1) Liquids of items 1 (b), 14, 31 (b), 81 to 83, acrylonitrile [item 2 (a)], acetonitrile [item 2 (b)], allyl chloride [item 4 (a)], 2-cyanopropan-2-ol [item 11 (a)], aniline [item 11 (b)], 1-chloro-2,3-epoxypropane [item 12 (a)], 2-chloroethanol [item 12 (b)], allyl alcohol [item 13 (a)], dimethyl sulphate [item 13 (b)], phenol [item 13 (c)], cresols [item 22 (a)] and xylenols [item 22 (b)] may be carried in tank wagons constructed for the purpose. The receptacles and their closures shall be in conformity with the general conditions for packing in marg. 402. Removable receptacles\* shall be fixed to the underframe of the wagons so that they cannot shift.

(2) Receptacles for substances of items 1 (b), 31 (b), 81 to 83, acrylonitrile [item 2 (a)], acetonitrile [item 2 (b)], allyl chloride [item 4 (a)], 2-cyano-propan-2-ol [item 11 (a)], 1-chloro-2,3-epoxypropane [item 12 (a)], 2-chloroethanol [item 12 (b)], allyl alcohol [item 13 (a)] and dimethyl sulphate [item 13 (b)] shall have all their openings above the level of the liquid; no piping or branch-pipe

\* The term "removable receptacle" means a receptacle which, while constructed to fit the special apparatus of the wagon, can, however, be removed from it only after the means of attachment have been dismantled.

shall pass through the walls of the receptacles below the level of the liquid. If the receptacles do not have double walls, they shall have no riveted seams. The openings shall be hermetically closed and the closure protected by means of a securely fixed metal cap. Receptacles for substances of items 2 (a) and (b), 4 (a), 11 (a), 12 (a) and (b), 13 (a) and (b) named above, and for substances of items 81 to 83 shall not be filled beyond 93% of their capacity.

(3) Receptacles for substances of item 14 must be made of welded fine-grain steel, with thoroughly reliable welds. They must, in addition, satisfy the following requirements:

(a) For non-removable receptacles:

1. They shall be made of sheet steel of a thickness such that the product of this thickness (in millimetres) and the minimum tensile strength (in kg/mm<sup>2</sup>) of the steel used must be at least equal to 520;
2. However, receptacles whose capacity does not exceed 10,000 litres may be made of sheet steel not less than 10 mm thick and those whose capacity does not exceed 12,500 litres may be made of sheet steel not less than 12.5 mm thick;
3. The construction of the receptacles must be such that they can withstand a hydraulic test at an effective pressure of 7 kg/cm<sup>2</sup>; this test must be repeated at the end of a period equal to twice the period prescribed for the periodic inspection of the wagon carrying the receptacle. The receptacles shall have all their openings above the level of the liquid; no piping or branch-pipe shall pass through the walls of the receptacles below the level of the liquid. Receptacles shall be surrounded by a protective covering whose thickness shall be at least 75 mm; this protective covering shall be kept in place by a sheathing made of sheet steel at least 3 mm thick or of sheet aluminium alloy of equivalent strength. The openings shall be hermetically closed and the closure shall be protected by means of a securely fixed metal cap.

(b) For removable receptacles\*:

1. Receptacles whose capacity and diameter do not exceed 6,000 litres and 1,500 mm respectively may be made of sheet steel at least 8 mm thick. The receptacles shall be calculated to withstand a hydraulic test at a pressure of 7 kg/cm<sup>2</sup>;
2. Before being put into service, receptacles shall undergo a leakage test of 2 kg/cm<sup>2</sup>. Each receptacle shall undergo an internal examination every two years. The leakage test and internal examination shall be carried out under the supervision of an expert approved by the competent authority;
3. Receptacles shall have all their openings above the level of the liquid; no piping or branch-pipe shall pass through the walls of the receptacles below the level of the liquid. The valves must not protrude beyond the receptacle and must ensure it is hermetically closed. The closure shall be protected by means of a securely fixed metal cap.

(c) Receptacles shall not be filled beyond 95% of their capacity.

(4) When handed over for carriage, tank wagons must not be contaminated on the outside by poisonous substances.

\* The term "removable receptacle" means a receptacle which, while constructed to fit the special apparatus of the wagon, can, however, be removed from it only after the means of attachment have been dismantled.

d. *For small containers*

- 439 (1) Packages, other than those which are fragile as specified in marg. 4 (5), containing substances set out in this Class may be carried in small containers.
- (2) The prohibitions on mixed loading laid down in marg. 441 must be applied to the contents of a small container.
- (3) Substances of items 41 and 73 may also be enclosed, without inner packaging, in small containers of the closed type with complete walls; the containers must be thoroughly washed out after unloading.
- (4) Aniline [item 11 (b)] may also be carried in small tank containers.

2. *Marking and danger labels on wagons and on small containers* (see Appendix IX)

- 440 (1) Wagons in which substances of items 1 to 5, 11 to 14, 21 to 23, 31 to 33, 41, 51 to 54, 81 and 82 are loaded shall bear on both sides labels conforming to model No. 4; wagons in which substances of items 2, 4 (a), 5 and 11 (a) are loaded shall bear in addition a label conforming to model No. 2. Wagons in which substances of items 61, 62, 71 to 75, 83 and 84 are loaded shall bear on both sides labels conforming to model No. 4 A.
- (2) Small containers in which packages of substances of items 1 to 5, 11 to 14, 21 to 23, 31 to 33, 41, 51 to 54, 81 and 82 or substances of item 41 in bulk are loaded shall bear a label conforming to model No. 4. Small containers in which packages containing substances of items 61, 62, 71 to 75, 83 and 84 or substances of item 73 in bulk are loaded shall bear a label conforming to model No. 4A.

Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

E. PROHIBITIONS ON MIXED LOADING

- 441 (1) Substances of Class IV a must not be loaded in the same wagon together with substances and articles of Class I a (marg. 21).
- (2) Substances of Item 5 must not be loaded in the same wagon together:
- (a) With articles of Class I b (marg. 61);
- (b) With articles of Class I c (marg. 101);
- (c) With substances of Class III a (marg. 301);
- (d) With substances of Class III b (marg. 331).
- (3) Aniline [item 11 (b)]—unless packed in conformity with marg. 408 (2) (a)—must not be loaded in the same wagon together with substances of Class III c, items 4 and 5 (marg. 371).
- (4) Substances of item 12 (a) and (d) must not be loaded in the same wagon together with substances of Class V (marg. 501), with the exception of solids of items 13, 15 (a) and 21.
- (5) Substances of items 32 and 33 must not be loaded in the same wagon together with substances of Class III c, item 3 (marg. 371), or with substances and articles of items 1 to 7 and 9, chlorosulphonic acid of item 11 (a) and substances of item 21 of Class V (marg. 501).

- 442 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon [art. 6, para. 10 (d) of CIM].

F. EMPTY PACKAGINGS

- 443 (1) Bags of items 91 and 92 shall be placed in cases or in impermeable bags preventing any loss of the contents.

(2) Other packagings of items 91 and 92, including receptacles of tank wagons and small tank containers, must be closed in the same manner and leak-proof in the same degree as though they were full.

(3) Packagings of item 91 handed over for carriage in less than full wagon loads, tank wagons, small tank containers and packed bags of item 91 shall bear labels conforming to model No. 4; packed bags of item 92 shall bear labels conforming to model No. 4 A (see Appendix IX).

(4) Empty packagings of items 91 and 92 shall be kept apart in wagons and goods depots from foodstuffs or other articles for consumption.

(5) The description in the consignment note must read: "*Empty packaging, IV a, item 91 (or 92), RID*". This description must be *underlined in red*.

#### G. OTHER REGULATIONS

444 Substances of this Class shall be kept apart in goods depots from foodstuffs or other articles for consumption.

445-449

### CLASS IV b. RADIOACTIVE SUBSTANCES

#### *Introductory notes*

1. Radioactive substances whose specific activity does not exceed 0.002 microcurie per gram are not subject to the provisions of Class IV b.

2. Radionuclides are divided into eight groups, as specified in Appendix VI, marg. 1600.

3. Every radionuclide not listed in the aforesaid marg. 1600, but whose identity is known, is to be classified according to its atomic number and physical half-life, in conformity with Appendix VI, marg. 1601.

Every radionuclide whose identity is not known is to be classified in Group I.

4. (a) Mixed fission products, as produced by the fission of fissile substances, are to be classified in Group II; the activity of such mixtures is the total activity of all the radionuclides present.

(b) A mixture belonging to only one radioactive decay chain and in which the proportions of the radionuclides are natural is to be considered as consisting of a single radionuclide.

The Group and activity are those of the first member of the chain present unless a radionuclide X has a half-life longer than that of the first member and an activity greater than that of any other member including the first at any time during carriage; in such a case, the Group in which the mixture is to be classified is the Group of the said radionuclide X, and the activity of the mixture is the maximum activity of that radionuclide during carriage.

(c) In the case of a mixture belonging to only one radioactive decay chain and in which the proportions of the radionuclides are greater than the natural proportions as a result of artificial physical or chemical enrichment, the member or members of the chain which are present in proportions greater than the natural proportions are to be treated as separate radionuclides; the rest of the chain is to be treated as under (b) above.

5. The activity of uranium and natural thorium shall be as calculated by using the activity-mass relationships given in Appendix VI, marg. 1602.

6. If the identity and activity of each radionuclide are known, the admissible activity of each radionuclide shall be such that the sum of  $F_1 + F_2 + \dots + F_8$  is not greater than unity; in which sum

$$F_1 = \frac{\text{total activity of the radionuclides of Group I}}{\text{applicable activity limit per package for radionuclides of Group I}}$$

$$F_2 = \frac{\text{total activity of the radionuclides of Group II}}{\text{applicable activity limit per package for radionuclides of Group II}}$$

and so on up to

$$F_8 = \frac{\text{total activity of the radionuclides of Group VIII}}{\text{applicable activity limit per package for radionuclides of Group VIII}}$$

NOTE. The mixtures referred to in 4 (b) above are to be considered as a single radionuclide.

7. For the purpose of applying the above formula in cases where the identities of all the radionuclides are known but the respective activities of all or some of them are not known, the radionuclides whose respective activities are not known are all to be classified in the most restrictive Group among those to which the radionuclides as a whole belong (their total activity must necessarily be known, either directly or by subtracting the total activity of the radionuclides whose respective activities are known from the total activity of the contents of the package).

If the identity of all or some of the radionuclides is not known, the said radionuclides are to be classified in Group I, as indicated in 3 above.

#### 1. List of substances

450

Among the substances and articles covered by the heading of Class IV b, only those listed in marg. 451 are to be accepted for carriage, and then only subject to the conditions set out in marg. 451 to 470. These substances and articles to be accepted for carriage under certain conditions are to be considered as substances and articles of RID.

NOTE. 1. Radioactive substances which may explode on contact with a flame or which are more sensitive to shock or to friction than dinitrobenzene are not to be accepted for carriage.

2. Radioactive substances which have a critical temperature lower than 50° C or, at this temperature, a vapour pressure greater than 3 kg/cm<sup>2</sup>, must be contained in receptacles which likewise meet the requirements of marg. 132 and 141 to 148.

3. Radioactive substances which are liable to spontaneous ignition must be contained in packagings the design of which has been approved by the competent authority referred to in marg. 452 (7) (a). This authority shall make out a certificate attesting that the design has been approved and specifying by a detailed description the substance for which the packaging may be used.

4. The following are to be considered to be radioactive substances in a special form:

(a) Radioactive substances in the form of a solid mass

- (i) Which either has no over-all dimension of less than 0.5 mm or has at least one dimension of not less than 5 mm;
- (ii) Which does not melt, sublime or ignite at temperatures not exceeding 538° C;
- (iii) Which neither breaks nor crumbles upon application of the percussion test laid down for the sample capsule in Appendix VI, marg. 1662.

- (iv) Which does not dissolve or convert into dispersible reaction products at a rate exceeding 50 micrograms per gram of substance when immersed for one week in water at 20° C having a pH value between 6 and 8 and a conductivity not exceeding 10 micromhos/cm;
  - (v) Which does not convert into dispersible reaction products at a rate exceeding 50 micrograms per gram of substance when exposed for one week to air at 30° C; and
- (b) Other radioactive substances contained in a capsule
- (i) Which either has no over-all dimension of less than 0.5 mm or has at least one dimension of not less than 5 mm;
  - (ii) Which is constructed of materials that meet the requirements stated in (a) (ii) to (v) above, except that the temperature referred to in (a) (ii) shall be 800° C;
  - (iii) The design of which is shown to meet the requirements of Appendix VI, marg. 1662.

5. Radioactive substances whose activity per package exceeds the following values are to be considered to be large sources:

(a) 5,000 Ci in the case of substances in a special form meeting

—Either the definition in note 4 (a) above;

—Or the definition in note 4 (b) above when the capsule is not used as a containment vessel within the meaning of marg. 452 (3) (a);

(b) In the case of other substances

Group	I	II	III	IV	V	VI	VII	VIII
Activity	20 Ci	20 Ci	200 Ci	200 Ci	5,000 Ci	50,000 Ci	50,000 Ci	50,000 Ci

6. For the purposes of RID plutonium-239, plutonium-241, uranium-233, uranium-235 and all substances containing any one of these radionuclides are to be considered to be fissile substances. All other radioactive substances are to be considered to be non-fissile.

**451**

1. (a) Non-fissile radioactive substances, other than those of items 1 (b), 2 and 5;
  - (b) Non-fissile radioactive substances in a special form (see note 4 to marg. 450) other than those of items 2 and 5.
    - For (a) and (b), see also marg. 451 a.
2. Non-fissile radioactive substances constituting large sources (see note 5 to marg. 450).
3. Fissile radioactive substances not covered by items 4 and 5. See also marg. 451 a.
4. Fissile radioactive substances constituting large sources.
5. Radioactive substances of low specific activity [see marg. 457 (I)]. See also marg. 451 a.
6. Empty packagings which have contained radioactive substances. See also marg. 451 a, under 2. C.

**451a**

With the exception of the regulations of marg. 470 (4) and (5), the regulations of chapter 2 "Conditions of carriage" do not apply to substances and articles handed over for carriage in conformity with the provisions set forth in 1 below and in 2.A, B, C or D below, as applicable.

1. (a) The dose rate at any point on the external surface of the package does not exceed 0.5 mR/h or equivalent [see marg. 453 (2), note];

(b) The non-fixed radioactive contamination on any external surface of the package does not exceed the levels laid down in Appendix VI, marg. 1604;



(c) The package contains no goods other than articles, instruments or apparatus connected with the use of these substances;

(d) Apart from articles of 2.D., the package does not contain more than 15 g of uranium-233 or 15 g of uranium-235 or 15 g of plutonium-239 or 15 g of plutonium-241 or 15 g of any combination of these radionuclides.

2. A. Radioactive substances whose activity does not exceed:

(i) Per package:

0.01 mCi in the case of radionuclides of Group I; or

0.1 mCi in the case of radionuclides of Group II; or

1 mCi in the case of radionuclides of Groups III, IV, V or VI or of radioactive substances in a special form, as defined in marg. 450, note 4 (a); or

25 Ci in the case of radionuclides of Groups VII or VIII;

(ii) In the case of tritium in the form of tritium oxides, in aqueous solution, a concentration of 0.5 mCi per millilitre;

on condition that these substances are packed in such a way that there can be no leakage in normal carriage.

The receptacle designed to prevent the escape of radioactive substances during carriage must bear the marking "RADIOACTIVE" in capital letters where it can be seen before the receptacle is opened.

The consignment note shall bear the words: "*Substances of Class IVb*, 451 a, RID".

NOTE. Radioactive substances having some other dangerous characteristic shall also be subject to the provisions of the relevant Class.

B. Pieces of apparatus such as electronic watches, tubes or instruments, or other manufactured articles in which radioactive substances are incorporated in a form not easily dispersible (this requirement does not apply to substances of Group VII) and whose activity per apparatus, instrument or article does not exceed:

0.1 mCi in the case of radionuclides of Group I; or

1 mCi in the case of radionuclides of Group II; or

10 mCi in the case of radionuclides of Group III; or

50 mCi in the case of radionuclides of Group IV or of radioactive substances in a special form, as defined in marg. 450, note 4 (a); or

1 Ci in the case of radionuclides of Groups V or VI; or

25 Ci in the case of radionuclides of Groups VII or VIII;

on condition that:

(i) Such pieces of apparatus, instruments or articles are firmly secured in strong packagings;

(ii) The dose rate at a distance of 10 cm from the apparatus, instrument or article before packing does not exceed 10 mR/h or equivalent;

(iii) The total activity per package does not exceed:

1 mCi in the case of radionuclides of Group I; or

50 mCi in the case of radionuclides of Group II; or

3 Ci in the case of radionuclides of Groups III or IV; or

20 Ci in the case of radioactive substances in a special form, as defined in marg. 450, note 4 (a); or

1 Ci in the case of radionuclides of Groups V or VI; or

200 Ci in the case of radionuclides of Groups VII or VIII.

The consignment note shall bear the words: "*Substances of Class IV b, 451 a, RID*".

C. Empty packagings which have contained radioactive substances (item 6), on condition that they are in good condition, cleaned internally and closed as though they were full.

The packaging shall bear the words: "Empty packaging having contained radioactive substances". The markings prescribed in marg. 452 (5) (d) and (6) (c), and the labels prescribed in marg. 459 (1) and (3), must no longer be visible.

The consignment note shall bear the words "*Empty packaging, IV b, 451 a, RID*".

D. Manufactured articles, other than fuel elements, in which the sole radioactive substance is natural or depleted uranium (e.g. packaging in which uranium is used for shielding radioactive substances), on condition that:

- (i) The surface of the uranium is covered by an inactive metal sheath; and that
- (ii) The activity per article does not exceed 3 curies.

## 2. Conditions of carriage

(The regulations relating to empty packagings are to be found under F.)

### A. PACKAGES

#### 1. General conditions for packing

452

(1) Packagings for substances of items 1 to 5 must be of type A or type B, the specifications for which are set out under (2) to (6) below. However, for substances of item 5, see also marg. 457.

(2) (a) All components necessary to ensure compliance with the provisions of this Class concerning packaging are considered to be part of the packaging.

The packaging may, in particular, comprise one or more receptacles, an absorbent material, structural components for spacing, a radiation shield, and devices for cooling, for absorbing mechanical shocks, and for thermal insulation. In the case of substances of items 2 and 4 these components and devices may include the vehicle and stowage system when these are an integral part of the packaging.

Any item added to the package at the time of carriage and not an integral part of the packaging must not be of such nature as to reduce the safety of the packaging.

(b) In choosing materials used for the manufacture of packagings, account must be taken of the variations in temperature which the packages might undergo during carriage or storage. For this purpose, temperatures of  $-40^{\circ}\text{C}$  and  $+70^{\circ}\text{C}$  are acceptable limits.

(c) The packaging must be such that any acceleration, vibration, or oscillation occurring during carriage cannot impair the effectiveness of the closing devices of the various receptacles or damage the packaging as a whole. In particular, nuts and bolts must not be able to work loose and the other securing devices must not be able to open accidentally.

(3) (a) The packaging must include a leakproof containment vessel kept closed by a reliable closing device.

NOTE. By "containment vessel" is meant the receptacle provided to ensure retention of the radioactive substance even if the receptacles inside the vessel break or leak. By "reliable closing device" is meant a device which cannot open by itself, can only be opened intentionally, and will withstand the effect of a possible increase of pressure inside the vessel.

The design of the containment vessel must take the radiolytic decomposition of liquids and other vulnerable materials into account.

(b) The containment vessel and its closing devices must be made of materials capable of withstanding any corrosive action of the contents.

(c) The containment vessel must be of sufficient strength to remain leak-proof if the ambient pressure is reduced to 0.5 atmosphere (absolute).

(d) If the containment vessel is not integral with the rest of the packaging, it must be fitted with a reliable closing device completely independent of the packaging.

(e) The packaging must be so designed that no increase in internal pressure can cause the containment vessel to break. A containment vessel intended to contain liquids or gases must be made of metal.

(f) The containment vessel must, if necessary, be provided with a radiation shield either outside or inside. The containment vessel may also be so designed as itself to constitute such a shield.

(g) If the containment vessel is surrounded by a radiation shield, the shield must be so designed that the vessel cannot escape from it. If the shield and the vessel together form a unit that is not integral with the rest of the packaging, the shield must be fitted with a reliable closing device completely independent of the packaging.

(h) Where attenuation of the radiation is obtained wholly or partly by maintaining the distance between the containment vessel and the outer casing of the packaging, the packaging must be so designed that this distance is maintained.

(i) Packaging which includes thermal insulation for the purpose of conforming to the provisions governing packagings of Type B [marg. 452 (6) (a)] must be so designed that the thermal insulation remains, or the parts of the packaging intended to provide this insulation remain, effective in the conditions resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646 and 1649.

(4) (a) The smallest external dimension of a package must not be less than 10 centimetres.

(b) Packages must be so designed that they can be easily handled and properly secured during carriage.

(c) Packages whose gross weight is between 10 and 50 kg must be fitted with handholds for manual handling.

(d) Packages whose gross weight exceeds 50 kg must be so designed that they can be safely handled by mechanical means.

(e) The lifting attachments provided on a package must conform to normal safety standards. Safety margins allowing for "snatch lifting" must be provided.

(f) Lifting attachments other than those referred to in (e) above, and any other feature on the outer surface of the packaging which could be used to lift the package, must either be completely covered or removed for carriage or be designed to support the whole weight of the package with a sufficient safety margin for "snatch lifting".

(g) So far as possible, the outside of the packaging must be free from projections. Devices such as safety valves and cocks must be recessed or protected by steel covers. The outer surfaces must also, so far as is possible in practice, be so designed and finished that they can be easily decontaminated.

(h) Every package must bear on the outside a device, such as a seal, which cannot break easily and by means of which unlawful opening of the package can be detected.

(i) Non-fixed radioactive contamination on every part of the outer surface of the package must be kept at the lowest level possible and shall not in any case exceed the levels specified in the table in Appendix VI, marg. 1604.

#### TYPE-A PACKAGINGS

(5) (a) A packaging of type A must be able to prevent any loss or dispersal of the radioactive contents and must retain its shielding properties in the conditions resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646.

(b) A packaging of type A intended for the carriage of liquids must in addition be able to prevent any loss or dispersal of the radioactive contents in the conditions resulting from the test prescribed in Appendix VI, marg. 1647, unless the containment vessel contains a sufficient quantity of absorbent material to absorb twice the volume of the liquid contents and one of the following conditions is fulfilled:

1. The absorbent substance is inside the protective shield; or
2. The absorbent substance is outside the shield and it can be shown that if the liquid contents are absorbed by that substance the dose rate will not exceed 1,000 mR/h or equivalent at the surface of the package.

(c) A packaging of type A intended for the carriage of tritium of Group VII having an activity exceeding 200 Ci or of other gases having an activity exceeding 20 Ci must in addition be able to prevent any loss or dispersal of the contents if the containment vessel is subjected separately to the test prescribed in Appendix VI, marg. 1647.

(d) In a packaging of type A intended for the carriage of gamma emitters having an activity exceeding 3 Ci and including a shield made of a material having a melting point below 815° C, the radioactive substance must be inside a closed steel vessel (which may be the containment vessel). No external dimension of this vessel shall be less than 5 cm and its wall thickness shall be at least 2 mm.

NOTE. For the purposes of this provision, only radioactive substances more than 10 per cent of whose disintegrations comprise a gamma emission of an energy exceeding 100 keV are considered to be gamma emitters.

The outer surface of the steel vessel or, if this vessel is inside a shield made of a material having a melting point above 815° C, the outer surface of the shield must bear conspicuously the trefoil symbol appearing on the labels, together with the word "RADIOACTIVE" in capital letters not less than 1 cm high, the whole being engraved, stamped, or reproduced by other means resistant to fire and water.

(e) Every package comprising a packaging of type A must bear on its outer surface the words "Type A" inscribed in a conspicuous and durable manner. A packaging whose design is subject to approval [see marg. 456 (11)] must, in addition, bear an identification mark [see marg. 456 (11) (d)] and a marking by which each packaging can be individually identified [see marg. 456 (11) (e)] inscribed in a conspicuous and durable manner on its outer surface.

## TYPE-B PACKAGINGS

(6) (a) A packaging of type B must, in the conditions resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646 and 1648 to 1651,

- (i) Prevent any loss or dispersal of the radioactive contents;
- (ii) Retain its shielding properties sufficiently to ensure that the radiation level at 1 m from the surface of the packaging will not exceed 1,000 mR/h if the package contains a sufficient quantity of iridium-192 to emit, before the tests, radiation of 10 mR/h at 1 m from the surface of the package. If a packaging of type B is intended for a particular radionuclide, that radionuclide may be used instead of iridium-192 as the emitter of reference.

(b) A packaging of type B must, in addition, be such that the containment vessel remains leakproof when the packaging is immersed in water to a depth of 15 m.

(c) Every packaging of type B must bear, conspicuously engraved, stamped or reproduced by any other means resistant to fire and to water on the outer surface of the outermost fire-resistant and water-resistant receptacle, the trefoil symbol appearing on the labels.

(d) Every package consisting of a type-B packaging must bear, inscribed on its outer surface in a conspicuous and durable manner, the words "Type B", the identification mark [see (7) (c) (ii)], the indication enabling each packaging to be individually identified [see (7) (c) (iii)] and, if the design of the package is subject to approval in conformity with marg. 456 (11), the identification mark prescribed in (11) (d) of that marginal.

(7) The following provisions govern the approval of designs for type-B packagings:

(a) Type-B packaging designs prepared in a country which is a Party to CIM must be approved by the competent authority of that country; if the country in which the design was prepared is not a Party to CIM, carriage may take place on condition that:

- (i) The country in question has certified that the packaging complies with the technical requirements of RID and the certificate is validated by the competent authority of the first CIM country reached by the consignment;
- (ii) If no certificate has been supplied, the packaging design is approved by the competent authority of the first CIM country reached by the consignment;

(b) The application for approval must include:

- (i) A qualitative description of the proposed contents, specifying in particular their physical and chemical state and the nature of the radiation emitted;
- (ii) A detailed description of the design, accompanied by accurate drawings and specifications of the materials and methods of construction used;
- (iii) A report on the tests carried out and the results obtained, or proof by calculation that the design satisfies the conditions laid down, or any other pertinent evidence;
- (iv) The operating instructions proposed by the designer for application by users when approval has been obtained;

(c) (i) The competent authority shall issue a certificate for each design approved or validated. The certificate shall specify any special restrictions on use which arise from the nature of the contents, and shall include all specific instructions for the use of the packaging in question;

- (ii) When a packaging design prepared in a country which is a Party to CIM is approved, the competent authority shall assign to that design an identification mark consisting of:

The symbol denoting the nationality of the country\* of the competent authority; and

The approval number (in uninterrupted numerical sequence);

- (iii) The aforesaid identification mark must be accompanied by an indication enabling each packaging manufactured in conformity with the approved design to be individually identified; the competent authority shall grant approval only on condition that the designer issues the said indication and notifies the competent authority thereof;

- (d) The manufacturer, the sender or the user of a packaging of an approved design must be able to furnish a complete certification to the competent authority that the methods and materials used in making the packaging conform to the standards approved for the design; the competent authority may carry out inspections of the packaging even during its manufacture.

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(1) Packages must belong to one of the following three Categories:

- (a) Category I-WHITE, if the dose rate of the radiation emanating from the package does not at any time during carriage exceed 0.5 mR/h or equivalent at any point on the outer surface of the package [see also under (b)];

- (b) Category II-YELLOW, if the limit indicated in sub-paragraph (a) above is exceeded, or if, whether that limit is exceeded or not, the package belongs to Nuclear Safety Class II [see marg. 456 (5)], and:

1. The dose rate of the radiation emanating from the package does not at any time during carriage exceed:

(i) 10 mR/h or equivalent at any point on the outer surface of the package;

(ii) 0.5 mR/h or equivalent at a distance of 1 metre from the centre of the package\*\*;

2. The transport index [see (4) and (5) below] does not at any time during carriage exceed 0.5;

- (c) Category III-YELLOW, if one at least of the limits indicated in (b) above is exceeded and:

1. The dose rate of the radiation emanating from the package does not at any time during carriage exceed:

\* The relevant symbols are as follows:

A	Austria	GB	Great Britain and Northern Ireland	P	Portugal
B	Belgium	GR	Greece	PL	Poland
BG	Bulgaria	H	Hungary	R	Romania
CH	Switzerland	I	Italy	S	Sweden
CS	Czechoslovakia	IRQ	Iraq	SF	Finland
D	Germany†	L	Luxembourg	SYR	Syria
DK	Denmark	MA	Morocco	TN	Tunisia
E	Spain	N	Norway	TR	Turkey
F	France	NL	Netherlands	YU	Yugoslavia
FL	Liechtenstein				

† *Observation of the Central Office:* In accordance with a communication from the competent Authorities of Germany (DB and DR), the symbol "D" is supplemented as follows: in the case of

the territory served by DB:  $\frac{\text{"D}}{\text{DB}}$ ; in the case of the territory served by DR:  $\frac{\text{"D}}{\text{DR}}$ .

\*\* If one of the over-all external dimensions of the package exceeds 2 m, this dose rate must not be exceeded either at the surface at the end of the long axis of the package or at 1 m from the long axis.

- (i) 200 mR/h or equivalent at any point on the outer surface of the package;
  - (ii) 10 mR/h or equivalent at a distance of 1 metre from the centre of the package\* [see, however, under (2) below];
2. The transport index [see (4) and (5) below] does not at any time during carriage exceed 10 [see, however, under (2) below].

(2) The limits prescribed under (c) 1. (ii) and 2 above may be exceeded on condition that the package is carried as a full load. In this case the dose rate must not exceed:

- (i) 200 mR/h or equivalent at any directly accessible point on the surface of the wagon;
- (ii) 10 mR/h or equivalent at a distance of 2 metres from any outer surface of the wagon.

NOTE. The unit of measurement of the dose rate is the milliroentgen per hour or equivalent.

The number of "milliroentgens per hour (mR/h) or equivalent" is the sum of the following values:

- (a) In the case of gamma and/or X-rays: the number of milliroentgens per hour;
- (b) In the case of beta radiation: the number of millirads per hour in air;
- (c) In the case of neutrons: the number of "milliroentgens per hour or equivalent", calculated in accordance with Appendix VI, marg. 1603, or the number of millirems per hour.

(3) Measurements of dose rate must be made with a suitable instrument. The value thus obtained shall be deemed to be the real dose rate. However, neutron fluxes may be either computed or measured.

(4) For packages not belonging to Nuclear Safety Class II, the measured value of the effect of the radiation emanating from packages of Category II-YELLOW and Category III-YELLOW shall be indicated by a transport index. The transport index is:

- (a) The number expressing the maximum dose rate in mR/h or equivalent at 1 metre from the centre of the package; or
- (b) If one of the over-all external dimensions of the package exceeds 2 metres, the number expressing whichever of the following two values is the higher:
  - (i) The maximum dose rate in mR/h or equivalent at the surface at the end of the long axis of the package; and
  - (ii) The maximum dose rate in mR/h or equivalent at 1 metre from the long axis.

(5) In the case of a package of Nuclear Safety Class II, the transport index is defined as the larger of the following two values:

- (a) The number expressing the maximum dose rate referred to under (4) (a) or (b) above; and
- (b) The number obtained by dividing 50 by the "permissible number" for such packages [see marg. 456 (10) (b)].

(6) The figure expressing the transport index must be rounded upwards to the first decimal.

\* If one of the over-all external dimensions of the package exceeds 2 m, this dose rate must not be exceeded either at the surface at the end of the long axis of the package or at 1 m from the long axis.

2. *Packing of individual substances*

454 (1) Substances of item 1 (a) shall be contained in packagings of type A or type B. The maximum activity per package is limited to the quantities indicated below:

(a) Type-A packagings:

Group	I	II	III	IV	V	VI	VII	VIII
Activity	1 mCi	50 mCi	3 Ci	20 Ci	20 Ci	1,000 Ci	1,000 Ci	1,000 Ci

(b) Type-B packagings:

Group	I	II	III	IV	V	VI	VII	VIII
Activity	20 Ci	20 Ci	200 Ci	200 Ci	5,000 Ci	50,000 Ci	50,000 Ci	50,000 Ci

(2) Substances of item 1 (b) shall be contained in packagings of type A or type B. The maximum activity per package is limited:

(a) For type-A packagings: to 20 Ci;

(b) For type-B packagings: to 5,000 Ci;

on condition that, in the case of a substance not complying with the definition in note 4 (a) to marg. 450 but complying with that in note 4 (b), the capsule is not used as a containment vessel. If the capsule is used as a containment vessel, the maximum activity is limited to the values listed under (1) (a) and (b) above.

(3) Every design of capsule shall be subject to approval by the competent authority of the country in which it was designed. On approval as aforesaid a certificate shall be issued attesting that the design complies with the requirements of this Class and specifying the nature of the radioactive substance which may be contained in capsules of that design.

The manufacturer, the sender or the user of a radioactive substance in a capsule of an approved design must be able to furnish to the competent authority a complete certification that the methods and materials used in making the capsule conform to the standards approved for the design.

455 (1) Substances of item 2 shall be contained in packagings of type B which must, in addition, satisfy the following conditions:

(a) The materials of the packaging and all components and internal structures must be physically and chemically compatible with one another and with the contents of the package;

(b) Every package whose containment vessel, in the conditions resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646 and 1648 to 1651, shows a pressure producing in the material of which the vessel is made a stress exceeding its yield stress at the temperature which it would probably reach during the tests must be fitted with a pressure-relief system;

(c) All valves, other than pressure-relief valves, through which the radioactive contents or the primary heat-transfer medium could escape and cause external contamination must be protected against any unauthorized manipulation and be provided with additional leakproof protection capable of retaining any leakage from the valve;

NOTE. By "primary heat-transfer medium" is meant any gas, liquid or solid, other than the radioactive source, inside the containment vessel.

(d) The packaging must be so designed that no lifting device fixed to the package can, when used as intended, produce in any material of the packaging a stress exceeding one third of its yield stress;



(e) Every retaining device fixed to the package must be so designed that the forces developing therein during carriage will not prevent the package from satisfying the provisions of this Class.

(2) The package must be so designed and made that:

(a) The heat generated inside the package by the radioactive substances it contains will not, at any time during carriage, reduce the effectiveness of the packaging. Particular attention shall be paid to effects of heat which may:

(i) Alter the arrangement, geometrical form or physical state of the contents or, if the substance is enclosed in a metal vessel or a receptacle, cause the metal vessel, the receptacle or the substance to melt;

(ii) Reduce the effectiveness of the packaging through cracking due to thermal stresses or through melting of the radiation shield;

(iii) Accelerate corrosion in the presence of moisture.

(b) The temperature of the accessible surfaces of the package does not exceed 50° C. However, this limit shall be 82° C if the package is carried as a full load.

(3) For the purposes of paragraphs (1) and (2) above, the package shall be assumed to be at ambient temperature, sheltered from wind and directly exposed to the sun, account being taken of diurnal variations of insolation. However, for the purposes of paragraph (2) (b), the package shall be assumed to be in the shade.

Any device intended to intercept solar radiation shall be deemed to be part of the package if it is shown either that such a device will retain its effectiveness in the conditions resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646, or that its continued effectiveness can be ensured by the supplementary requirements to be met during carriage which are specified in the certificate of approval of the consignment [see (9) (c)].

#### *Approval of package designs*

(4) A design which complies with all the following provisions must be approved by the competent authority designated in marg. 452 (7) (a):

(a) The package must satisfy the requirement of marg. 452 (6) (a) (i) in the conditions resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646 and 1648 to 1651;

(b) The design must satisfy the requirement under (a) without the use of filters;

(c) A package containing a primary heat-transfer medium must not use a system allowing continuous pressure relief during carriage;

(d) The package must not comprise any containment-vessel venting device which would release radioactive substances into the environment in the conditions resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646 and 1648 to 1651;

(e) If the maximum normal operating pressure of the containment vessel, added to any differential pressure below atmospheric pressure at mean sea-level to which it may be subjected, exceeds 0.35 kg/cm<sup>2</sup>, the containment vessel must be capable of withstanding a pressure at least equal to one-and-one-half times the sum of these pressures. The stress at this pressure, at the highest operating temperature expected, must not exceed 75% of the yield stress or 40% of the breaking strength of the material of which the containment vessel is made;

NOTE. By "maximum normal operating pressure" is meant the highest pressure above atmospheric pressure at mean sea level which can arise inside the containment

vessel in conditions of temperature and solar radiation corresponding to ambient conditions during carriage and based on a period of one year.

- (f) If, at the maximum normal operating pressure, the package is subjected to the thermal test prescribed in Appendix VI, marg. 1650, the pressure in the containment vessel must not exceed that corresponding to the yield stress of the material of which the vessel is made at the highest temperature which the vessel may reach during the test;
- (g) In the case of a package requiring the use of a primary heat-transfer medium or containing a gaseous or liquid source, the maximum normal operating pressure must not exceed 7 kg/cm<sup>2</sup>;
- (h) In the condition resulting from the tests prescribed in Appendix VI, marg. 1648 to 1651, a package comprising a primary heat-transfer medium must not lose more than the lesser of the following amounts of that medium in one week:
  - If the medium is in the form of a gas or a vapour, 0.1% by volume, or 5 litres at 0° C and at a pressure of 760 mm of mercury;
  - If the medium is liquid, 0.1% by volume or 0.5 litre;
- (i) Absence of leakage from the source in normal conditions must not depend upon a mechanical cooling system;
- (k) An ancillary external cooling device must not be used to satisfy the requirement of (c);
- (l) In the case of a package comprising a liquid primary heat-transfer medium or containing a radioactive substance in liquid form, the containment vessel must remain undamaged at a temperature of – 40° C.

NOTE. 1. For the purposes of the conditions laid down in (2) and (3) and of the above requirements concerning pressure, it is assumed that the ambient conditions are as follows:

(i) Temperature: 38° C;

(ii) Insolation:

—Packages with flat surfaces:

If carried horizontally:

Base: nil;

Other surfaces: 800 cal/cm<sup>2</sup> during 12 hours per day;

If not carried horizontally:

200 cal/cm<sup>2</sup> during 12 hours per day;

—Packages with curved surfaces:

400 cal/cm<sup>2</sup> during 12 hours per day.

2. However, for packages which are to be carried only between certain specified countries, conditions other than those stated in Note 1 above may be allowed if the competent authority of each of the countries concerned consents thereto. Similarly, in such cases a temperature differing from that specified in sub-paragraph (1) of this paragraph may be allowed by agreement among the competent authorities.

(5) (a) The application for approval of package designs conforming to paragraph (4) must include, in addition to the particulars prescribed in marg. 452 (7) (b), a detailed description of the proposed contents and complete evidence that the design in question satisfies the provisions of this marginal. If the package is designed to withstand a maximum normal operating pressure exceeding 1.05 kg/cm<sup>2</sup>, the application for approval must, with respect to the materials used in the manufacture of the containment vessel, state in particular the specifications, the samples to be taken and the tests to be performed.

(b) The certificate of the competent authority shall include, in addition to the particulars referred to in marg. 452 (7) (c), a detailed description of the authorized contents and any appropriate information concerning the assumed ambient conditions (temperature, solar radiation) on which the approval is based [see paragraph (4), note 2].

(6) (a) If a package design does not comply with all the requirements of paragraph (4), it must be approved by the competent authority referred to in marg. 452 (7) (a) and by the competent authority of each country in whose territory the package is to be carried.

(b) Such a design shall be deemed to satisfy the requirements of marg. 452 (6) (a) (i) if, in the conditions resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646 and 1648 to 1651, the activity which can be liberated in one week in the form of contaminated gas, vapour or liquid coming from the primary heat-transfer medium or from the space originally occupied by that medium does not exceed the following values:\*

Group	Activity	Group	Activity	Group	Activity
I .....	1 mCi	III .....	3 Ci	V .....	20 Ci
II .....	50 mCi	IV .....	20 Ci	VI .....	1,000 Ci

(c) Where such a package is designed to liberate contaminated gas or vapour coming from the gaseous or liquid primary heat-transfer medium by continuous venting in the conditions resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646, and taking into account the ambient conditions assumed during carriage (temperature, solar radiation), the activity thus liberated must not exceed the following rates:\*

Group	Maximum rate	Group	Maximum rate	Group	Maximum rate
I .....	0,05 $\mu$ Ci/h	III .....	0.15 mCi/h	V .....	1 mCi/h
II .....	2,5 $\mu$ Ci/h	IV .....	1 mCi/h	VI .....	0.05 Ci/h

Such a package must be carried only as a complete load.

(7) In addition to the requirements of (5), the following requirements apply to the approval of packages conforming to the conditions laid down in (6):

- (a) The application for approval must expressly state, where appropriate, the maximum and minimum ambient conditions (temperature, solar radiation) which can be expected to be encountered during carriage and which have been taken into account in the design; it must also specify the additional requirements to be complied with during carriage\*\*;
- (b) The certificate of the competent authority must state the additional requirements to be complied with during carriage\*\*. The approval by the competent authority of each country in whose territory the package is to be carried may take the form of validation of the certificate issued by the competent authority referred to in marg. 452 (7) (a). Every competent authority giving its approval in this form must specify any other additional requirements compliance with which during carriage\*\* it considers necessary.

\* In the case of rare gases, the Group is that in which they are classified when uncompressed. Tritium and its compounds are considered as belonging to Group IV.

\*\* I.e. measures during carriage which, while not prescribed in the ordinary way by this marginal, are considered necessary to ensure the safety of the package during carriage; in particular, any human intervention to measure temperature or pressure or to carry out periodic pressure reduction. These measures must also allow for the possibility of an unexpected delay.

*Approval of carriage and prior notification*

(8) The following provisions apply to approval of the carriage of packages whose design satisfies the requirements stated in (4):

- (a) The consignment must be approved by the competent authority of its country of origin. However, if that country is not a Party to CIM, the first CIM country reached by the consignment shall be deemed to be its country of origin;
- (b) The application for approval must contain:
  - Either a detailed certification by the manufacturer, the sender or the user that the methods and materials used in making the packaging conform to the specifications of the approved design, or a document, issued by the competent authority of the country in which the packaging was manufactured, certifying that that authority has received such detailed certification from the manufacturer, the sender or the user; and
  - All the information necessary to show that the consignment complies with the relevant requirements; in addition, any special loading, unloading or handling procedures must be specified where appropriate;
- (c) When approving a consignment, the competent authority shall issue a certificate:
  - (i) Specifying the measures which the sender must take before handing over the consignment for carriage; and
  - (ii) Attesting that no additional requirements to be complied with during carriage are necessary\*.
- (d) Arrangements must be made in advance with each of the railway administrations concerned so that they can take the necessary steps for carriage in good time. The railway administrations must be informed, if necessary, of special measures to be taken in the event of an accident;
- (e) The consignment must be notified in advance to the competent authority of each of the countries in which the package is to be carried. The notification must contain the information necessary to enable the competent authority to identify the consignment.

(9) Approval of the carriage of packages covered by (6) is governed by the following provisions in addition to the provisions of (8) other than (8) (c) (ii):

- (a) Carriage must be approved by every competent authority whose certificate of approval of the package design, or whose validation, both as referred to in (7) (b), lays down additional requirements to be complied with during carriage\*, except such authority as may have waived the right of approval of carriage at the time when the package design was approved;
- (b) The application for approval of carriage must specify the mode of carriage, the transport equipment, the intended route, and any additional requirements under (7) (b) to be complied with during carriage;
- (c) The certificate of approval of carriage issued by a competent authority must state the additional requirements, to be complied with during carriage, which it has prescribed under (7) (b). The approval by a competent authority may

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\* I.e. measures during carriage which, while not prescribed in the ordinary way by this marginal, are considered necessary to ensure the safety of the package during carriage; in particular, any human intervention to measure temperature or pressure or to carry out periodic pressure reduction. These measures must also allow for the possibility of an unexpected delay.

take the form of validation of the certificate issued by another competent authority.

(10) If a consignment passes through countries whose languages differ, any additional requirements prescribed under (9) (c) to be complied with during carriage shall be drawn up in an official language of the country of origin of the consignment [see (8) (a) above] and in an official language of each of the countries whose competent authority has prescribed such requirements.

*Provisions to be complied with before handing over for carriage*

(11) Before a packaging is put into service for the first time, the sender shall make sure by tests:

- (a) That the shielding and heat-transfer characteristics of the packaging meet the specifications of the approved design;
- (b) If the containment vessel of a packaging has been designed to withstand a maximum normal operating pressure exceeding  $0.35 \text{ kg/cm}^2$ , that the containment vessel of each packaging, manufactured in conformity with the approved design, meets the prescribed specifications.

(12) Before handing each consignment over for carriage the sender shall:

- (a) Hold the package until the temperature of the system has reached equilibrium, unless it has been established to the satisfaction of the competent authority that the conditions of equilibrium will be in conformity with the requirements of this marginal;
- (b) Make sure, in the case of packages other than those referred to in (6) (c), that the closure of the package is sufficiently effective to prevent any leakage of contaminated gas or vapour from the primary heat-transfer medium from exceeding the following rates\*:

Group	Maximum rate	Group	Maximum rate	Group	Maximum rate
I .....	0,001 $\mu\text{Ci/h}$	III .....	3. $\mu\text{Ci/h}$	V .....	0.02 mCi/h
II .....	0,05 $\mu\text{Ci/h}$	IV .....	0.02 mCi/h	VI .....	1 mCi/h

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(1) Substances of items 3 and 4 shall, except in the cases referred to in (2), be packed in conformity with the provisions of (3) to (13) below.

In addition:

- (a) Substances of item 3 shall be packed either in conformity with the provisions of marg. 454 (1) or, in the case of radioactive substances in a special form in accordance with marg. 450, note 4, in conformity with the provisions of marg. 454 (2);
- (b) Substances of item 4 shall be packed in conformity with the provisions of marg. 455 (1) to (7), (11) and (12).

NOTES re (b). 1. Special cases of irradiated fuels:

—In connexion with marg. 455 (1) (a), the design of the containment vessel must allow for the production of gas by radiolysis and by chemical reaction between the fuel elements and any liquid primary heat-transfer medium;

—In connexion with marg. 455 (5) (a), the sender must furnish a certificate, issued by the competent authority of the country in which the fuel was irradiated, confirming, on

\* In the case of rare gases, the Group is that in which they are classified when uncompressed. Tritium and its compounds are considered as belonging to Group IV.

the basis of the information available to that authority regarding the fuel after irradiation, any assumptions made, in analysing the safety requirements, concerning the behaviour of the fuel.

2. In connexion with marg. 455 (1) (a), concerning provisions to be complied with before handing over for carriage, if neutron absorbers are necessary to prevent criticality, the sender must carry out neutron multiplication tests to ensure that the poisoning is adequate.

(2) The provisions of paragraphs (3) to (13) below are not applicable:

- (a) To packages each containing not more than a total of 15 g of uranium-233 or 15 g of uranium-235 or 15 g of plutonium-239 or 15 g of plutonium-241 or 15 g of any combination of these radionuclides;
- (b) To packages containing natural or depleted uranium, whether irradiated or not, in whatever quantity;
- (c) To packages containing homogeneous hydrogenous solutions or mixtures in which the only fissile component is one of the following elements:
  - (i) U-233 or U-235 when the atomic ratio H:U-233 or H:U-235 is greater than 5,200, which in common aqueous solutions corresponds to a concentration of U-233 or U-235 of less than 5 g per litre; or
  - (ii) Plutonium when the atomic ratio H:Pu is greater than 7,600, which in common aqueous solutions corresponds to a concentration of plutonium of less than 3.5 g per litre;

on condition that the maximum quantities of fissile substance per package do not exceed: U-235: 800 g; U-233: 500 g; Pu: 500 g.

If the package contains several fissile substances, the ratio of hydrogen atoms to fissile atoms must be greater than 7,600 and the maximum quantity of fissile substance must not exceed 500 g per package;

- (d) To packages containing substances in which the only fissile component is enriched uranium whose uranium-235 content does not exceed 1 per cent of the total weight of uranium and is homogeneously distributed in the substance, a further condition being that this substance is not arranged in lattice form in the package.

#### *General provisions relating to nuclear safety*

(3) All fissile substances must be so packed and dispatched that criticality cannot be reached in any foreseeable circumstances of carriage. In particular, the following possibilities must be taken into account:

- (a) Penetration of water into the packages;
- (b) Loss of effectiveness of built-in neutron absorbers or moderators;
- (c) A change in the arrangement of the contents leading to greater reactivity either inside the packaging or, through leakage of the contents, outside the packaging;
- (d) Reduction of spaces between packages or between contents;
- (e) Immersion of packages in water or burial in snow; and
- (f) Intermingling of packages.

(4) In the case of an irradiated nuclear fuel or of unspecified fissile substances, the following assumptions shall be made:

- (a) Irradiated nuclear fuel. A nuclear fuel whose degree of irradiation is not known and whose reactivity decreases with burn-up shall be considered as

non-irradiated for purposes of criticality-risk verification. If the reactivity increases with burn-up, the fuel shall be considered as irradiated fuel in a state of maximum reactivity. If the degree of irradiation is known, the reactivity of the fuel can be evaluated accordingly.

- (b) Unspecified fissile substances (such as residues or scrap). In the case of fissile substances whose enrichment, mass, concentration, moderating ratio, or density is not known or cannot be determined, each unknown parameter shall be ascribed the value giving maximum reactivity in the foreseeable conditions.

(5) Packages of fissile substances other than the packages referred to in (2) above must be of one of the following Classes:

- (a) Nuclear Safety Class I: packages not presenting any nuclear risk, whatever their number and arrangement, in any foreseeable circumstances of carriage;
- (b) Nuclear Safety Class II: packages not presenting any nuclear risk if limited in number, whatever their arrangement and in any foreseeable circumstances of carriage;
- (c) Nuclear Safety Class III: packages which, while not presenting any nuclear risk, cannot be considered to be packages of Nuclear Safety Class I or II.

*Special provisions relating to packages of Nuclear Safety Class I*

(6) All packages of Nuclear Safety Class I must be so designed that in the conditions resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646, and disregarding the exceptions provided for in marg. 1643 (1),

- (a) Water cannot penetrate into the containment vessel; and
- (b) The configuration of the contents and the geometry of the containment vessel cannot be significantly altered.

(7) The nuclear safety criteria for packages of Nuclear Safety Class I are as follows:

- (a) In the case of an individual package:

1. The following circumstances shall be assumed to exist:
  - (i) The package exhibits the maximum damage which, demonstrably, would occur if it were subjected to the tests prescribed in Appendix VI, marg. 1642 to 1646 and 1648 to 1651, disregarding the exceptions provided for in marg. 1643 (1);
  - (ii) Water can penetrate into all void spaces; however, if the design of the packaging incorporates special features intended to prevent water from penetrating, even as a result of human error, into certain of the void spaces, those spaces may be assumed to contain no water if such an assumption is specifically approved by the competent authority of the country in which the packaging was designed and by the competent authorities of all the countries in whose territory the package is to be carried;
2. The contents of the containment vessel shall not exceed 80% of the mass\* of a similar system of fissile and non-fissile contents, having the same form and configuration, which would be critical in the conditions of 1. above, taking into account its physical and chemical characteristics, including any change which might occur in those characteristics in the conditions of 1. above and in the conditions of moderation and reflection specified below:

\* In the case of fuel elements, the mass is expressed in terms of the number of elements.

(i) With the substance inside the containment vessel:

- The most reactive configuration and moderation foreseeable in the conditions of 1;
- Full reflection by the water around the containment vessel or such greater reflection around the containment vessel as might be caused by the material of the packaging itself;

and, in addition:

(ii) If any part of the substance can escape from the containment vessel in the conditions of 1. above;

- The most reactive configuration and moderation; and
- Full reflection by the water around this substance.

(b) In addition, in the case of groups of packages:

- I. Any number of undamaged packages, in any arrangement whatever, intermingled with any number of other undamaged packages of Nuclear Safety Class I, themselves in any arrangement whatever, must remain sub-critical; for this purpose, the term "undamaged" means the condition in which the packages are designed to be handed over for carriage;
2. 250 such packages, when damaged, must remain sub-critical if they are stacked in any way whatever and a reflector equivalent to water is immediately adjacent to the stack on three mutually adjoining sides; for this purpose, the term "damaged" means the evaluated or demonstrated condition of each package resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646 and 1648 to 1651, disregarding the exceptions provided for in marg. 1643 (1). It shall further be assumed that homogeneous hydrogenous moderation occurs to such extent between the packages and such quantity of water compatible with the test results penetrates into the package that maximum reactivity ensues.

(8) Compliance with the nuclear safety criteria set out in (7) above shall be verified either by

- (a) Applying the method of calculation shown in Appendix VI, marg. 1621; or by
- (b) Checking compliance with the data of the physical model shown in Appendix VI, marg. 1622.

*Special provisions relating to packages of Nuclear Safety Class II*

(9) All packages of Nuclear Safety Class II must be so designed that in the conditions resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646, and disregarding the exceptions provided for in marg. 1643 (1):

(a) Neither the volume, nor any spacing, on the basis of which the nuclear safety of a group of such packages has been calculated can be reduced by more than 5%;

(b) Water cannot penetrate into the containment vessel; and

(c) The configuration of the contents and the geometry of the containment vessel cannot be significantly altered.

(10) The nuclear safety criteria for packages of Nuclear Safety Class II are as follows:

(a) In the case of an individual package the criteria applicable shall be the same as those set out in (7) (a).

(b) In addition, a "permissible number" shall be calculated for each package design of Nuclear Safety Class II, such that:



1. A group of undamaged packages equal to five times the “permissible number” will remain sub-critical if the packages are stacked in any arrangement, one directly on top of another, and a reflector equivalent to water is immediately adjacent to the stack on all sides; for this purpose, the term “undamaged” means the condition in which the packages are designed to be handed over for carriage;
2. A group of damaged packages equal to twice the “permissible number” will remain sub-critical if the packages are stacked in any arrangement and a reflector equivalent to water is immediately adjacent to the stack on all sides; for this purpose, the term “undamaged” means the evaluated or demonstrated condition of each package resulting from the tests prescribed in Appendix VI, marg. 1642 to 1646 and 1648 to 1651, disregarding the exceptions provided for in marg. 1643 (1). It shall further be assumed that homogeneous hydrogenous moderation occurs to such extent between the packages and such quantity of water compatible with the test results penetrates into the package that maximum reactivity ensues.

*Approval of designs of packages of Nuclear Safety Classes I, II and III*

(11) The following provisions apply to the approval of designs of packages of Nuclear Safety Classes I, II and III:

(a) Package designs prepared in a country which is a Party to CIM must be approved by the competent authority of that country; if the country in which the design was prepared is not a Party to CIM, carriage may take place on condition that:

- (i) The country in question has certified that the design complies with the technical requirements of RID and the certificate is validated by the competent authority of the first CIM country reached by the consignment;
- (ii) If no certificate has been supplied, the package design is approved by the competent authority of the first CIM country reached by the consignment.

(b) The application for approval must include all the information necessary to satisfy the competent authority that the design complies with the provisions of this marginal.

(c) The competent authority shall issue a certificate for each design approved or validated. This certificate shall include:

- (i) For packages of Nuclear Safety Class I: a detailed description of the permitted contents;
- (ii) For packages of Nuclear Safety Class II: a detailed description of the permitted content or contents and the “permissible number” or “permissible numbers” in conformity with paragraph (10) (b);
- (iii) For packages of Nuclear Safety Class III: a detailed description of the individual consignment and particulars of any special precautions to be taken during carriage,

and, in each case, all appropriate instructions for using the packaging.

(d) When a package design prepared in a country which is a Party to CIM is approved, the competent authority shall assign to that design an identification mark consisting of:

- The national symbol of the country\* of the competent authority; and
- The approval number (in uninterrupted numerical sequence).

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\* The symbols are listed in the footnote to marg. 452 (7) (c) (ii).

(e) The aforementioned identification mark must be accompanied by an indication enabling each packaging manufactured in conformity with the approved design to be individually identified; the competent authority shall grant approval only on condition that the designer furnishes the aforementioned indication and notifies the competent authority thereof.

(f) In addition, except in the case of packages of Nuclear Safety Class I satisfying the requirements of Appendix VI, marg. 1622, and conforming to the permitted contents values specified in Tables I to X appertaining to those requirements, each package design must be approved by the competent authority of each country in which the package is to be carried; such approval may take the form of validation of the certificate issued by the competent authority referred to in (a) above. In the case of packages of Nuclear Safety Class III, every competent authority giving its approval must specify any other special precautions compliance with which during carriage it considers necessary.

(g) The manufacturer, the sender or the user must be able to furnish to the competent authority a complete certification that the methods and materials used in making the packaging conform to the standards approved for the design; the competent authority may carry out inspections of the packaging even during its manufacture.

*Approval of carriage and prior notification*

(12) The following provisions apply to approval of the carriage of packages of Nuclear Safety Classes I and II containing substances of item 4, and of packages of Nuclear Safety Class III:

(a) Consignments of packages of Nuclear Safety Classes I and II containing substances of item 4 and whose design satisfies the requirements of marg. 455 (4):

1. The consignment must be approved by the competent authority of its country of origin. However, if that country is not a Party to CIM, the first CIM country reached by the consignment shall be deemed to be its country of origin;
2. The application for approval must contain:
  - Either a detailed certification by the manufacturer, the sender or the user that the methods and materials used in making the packaging conform to the specifications of the approved design,
  - Or a document, issued by the competent authority of the country in which the packaging was manufactured, certifying that that authority has received such detailed certification from the manufacturer, the sender or the user; and
  - All the information necessary to show that the consignment complies with the relevant requirements; in addition, any special loading, unloading or handling procedures must be specified where appropriate;
3. When approving a consignment, the competent authority shall issue a certificate:
  - (i) Specifying the measures which the sender must take before handing over the consignment for carriage; and
  - (ii) Attesting that no additional requirements to be complied with during carriage are necessary\*;

\* I.e. measures during carriage which, while not prescribed in the ordinary way by this marginal, are considered necessary to ensure the safety of the package during carriage; in particular, any human intervention to measure temperature or pressure or to carry out periodic pressure reduction. These measures must also allow for the possibility of an unexpected delay.

4. Arrangements must be made in advance with each of the railway administrations concerned so that they can take the necessary steps for carriage in good time. The railway administrations must be informed, if necessary, of special measures to be taken in the event of an accident;
5. The consignment must be notified in advance to the competent authority of each of the countries in which the package is to be carried. The notification must contain the information necessary to enable the competent authority to identify the consignment.

(b) The carriage of packages of Nuclear Safety Class III and the carriage of packages of Nuclear Safety Classes I and II containing substances of item 4, approval of the design of which packages is referred to in marg. 455 (6), are governed by the following provisions in addition to the provisions of (a) other than (a) 3 (ii):

1. Carriage must be approved by every competent authority whose certificate of approval of the package design, or whose validation, both as referred to in marg. 456 (11) (c) (iii) or 455 (7) (b), lays down special precautions or additional requirements to be complied with during carriage, except such authority as may have waived the right of approval of carriage at the time when the package design was approved;
2. The application for approval of carriage must specify the mode of carriage, the transport equipment, the intended route, and any special precautions or additional requirements under marg. 456 (11) (c) (iii) or 455 (7) (b) to be complied with during carriage;
3. The certificate of approval of carriage issued by a competent authority must state the special precautions or additional requirements, to be complied with during carriage, which it has prescribed under marg. 456 (11) (c) (iii) or 455 (7) (b). If the sending of other consignments together with packages of Nuclear Safety Class III is prohibited, that prohibition must be expressly stipulated in the certificate of approval. The approval by a competent authority may take the form of validation of the certificate issued by another competent authority.

(13) If a consignment passes through countries whose languages differ, any special precautions or additional requirements prescribed under (12) (b) 3. above to be complied with during carriage shall be drawn up in an official language of the country of origin of the consignment [see (12) (a) 1.] and in an official language of each of the countries whose competent authority has prescribed such precautions or requirements.

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(1) The substances of item 5 are the following:

- (a) Uranium or thorium ores and physical or chemical concentrates of these ores;
- (b) Non-irradiated natural or depleted uranium and non-irradiated natural thorium;
- (c) Tritium, in the form of tritium oxides, in aqueous solution, on condition that the concentration does not exceed 5 mCi/ml;
- (d) Substances in which the activity is uniformly distributed and the estimated concentration per gram does not exceed:
  - (i) 0.1 microcurie in the case of radionuclides of Group I; or
  - (ii) 5 microcuries in the case of radionuclides of Group II; or
  - (iii) 300 microcuries in the case of radionuclides of Groups III and IV.

In the case of fissile substances, the limits specified in marg. 456 (2) (a), (c) or (d) must be respected. If these limits are exceeded, the substances fall under marg. 451, item 3, but without application of the provisions of marg. 456 (1) (a);

(e) Articles which, while made of non-radioactive substances, are externally contaminated by a radioactive substance; on condition that:

(i) The radioactive substance is not in an easily dispersible form and the average surface contamination on 1 m<sup>2</sup> does not exceed:

0.1 microcurie/cm<sup>2</sup> in the case of alpha emitters of Group I; or

1 microcurie/cm<sup>2</sup> in the case of other radionuclides;

(ii) The articles are suitably wrapped or enclosed.

(2) Up to the levels of activity per package specified in marg. 454 (1) (a), the substances of low specific activity referred to in paragraph (1) (a) and (b), if not in liquid or gaseous form, may be dispatched in industrial packagings which need only comply with the requirements of marg. 452 (2) and (4) and be strong enough to prevent any loss of the contents in normal carriage. In the case of substances in a special form, the limit specified in marg. 454 (2) (a) shall apply.

Substances referred to in paragraph (1) (b) which are in the form of a massive solid shall be so packed as to prevent movement of any kind liable to cause abrasion of the substance; if they are in some other compact solid form they shall be placed in a metal vessel inert towards them, or in a sheathing of other resistant materials, so that the surfaces of the substances are not exposed.

(3) Substances of low specific activity carried as a full load may be dispatched in industrial packagings strong enough to prevent any loss of the contents in normal carriage, but the packages need not comply with the requirements of marg. 452 and 453.

Substances referred to in paragraph (1) (b) which are in the form of a massive solid must be so packed as to prevent movement of any kind liable to cause abrasion of the substance; if they are in some other compact solid form they shall be placed in a metal vessel inert towards them, or in a sheathing of other resistant materials, so that the surfaces of the substances are not exposed.

(4) Where substances of item 5 are carried as a full load, the estimated total activity of the contents of each wagon must not exceed:

(a) 0.1 Ci in the case of radionuclides of Group I; or

(b) 5 Ci in the case of radionuclides of Group II; or

(c) 250 Ci in the case of radionuclides of Groups III and IV.

If the substances contain radionuclides of several groups, the sum of all the values indicated below must not exceed 1:

(Number of curies of Group I) × 10

(Number of curies of Group II) × 1/5

(Number of curies of Group III) × 1/250

(Number of curies of Group IV) × 1/250.

(5) Where substances of item 5 are carried as a full load, the dose rate must not exceed:

(a) 200 mR/h or equivalent at any directly accessible point on the surface of the wagon;

(b) 10 mR/h or equivalent at a distance of 2 metres from any outer surface of the wagon.

(6) For the carriage of substances of item 5 in bulk, in tank wagons or in small containers, see marg. 463, 464 and 465.

3. *Mixed packing*

458 A package containing radioactive substances must not contain in addition anything other than articles and instructions necessary for the use of those substances; however, the presence of such articles must not constitute an additional risk through the possibility of a reaction with the radioactive contents.

4. *Marking and danger labels on packages* (see Appendix IX)

459 (1) With the exception of packages containing substances of item 5 carried as a full load, every package containing substances and articles of Class IV b shall bear, on two opposite sides,

Labels conforming to model No. 6 A in the case of packages of Category I-WHITE;

Labels conforming to model No. 6 B in the case of packages of Category II-YELLOW; and

Labels conforming to model No. 6 C in the case of packages of Category III-YELLOW [see marg. 453 (1)].

(2) The labels shall be completed by the addition of the following particulars in clear and indelible characters:

(a) Alongside the word "contents", the name of the radionuclide or substance whose presence constitutes the principal danger in the event of damage to the package (for example: "strontium-90"; "irradiated uranium");

(b) Alongside the word "activity", the total activity of the contents in curies;

NOTE. The total activity may also be expressed in microcuries, millicuries or kilocuries on condition that the prefixes "micro", "milli" and "kilo" are written in full.

(c) On labels of models Nos. 6 B and 6 C the transport index shall also be entered, in the largest possible figures, in the box provided for the purpose.

(3) Packages containing fragile receptacles not visible from the outside shall bear a label conforming to model No. 9. If the fragile receptacles contain liquids, the packages shall in addition, except in the case of sealed ampoules, bear labels conforming to model No. 8; these labels shall be affixed high up on two opposite sides of cases or in an equivalent manner on other packagings.

B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

460 (1) The following may not be forwarded otherwise than in full wagon loads:

(a) Consignments of packages handed over for carriage in accordance with marg. 453 (2);

(b) Consignments of packages of substances of items 2 and 4 handed over for carriage in accordance with marg. 455 (2) (b), last sentence, and 455 (6) (c);

(c) Consignments of substances of item 5 handed over for carriage in accordance with marg. 457 (3) to (5) or 463.

(2) (a) In the case of consignments of packages carried in less than full wagon loads, the number of packages of Categories II-YELLOW and III-YELLOW in the same consignment shall be so limited that the sum of the transport indices shown on the labels does not exceed 50. Where limitation is made by reference to the red bands marked on the labels, a package of Category II-YELLOW and a package of Category III-YELLOW are to be considered equivalent respectively to a transport index of 0.5, and a transport index of 10.

(b) In the case of consignments carried in full wagon loads, that limit may be exceeded; nevertheless the number of packages of Nuclear Safety Class II must not exceed the permissible number\*\*.

(3) Radioactive substances may also be sent as express parcels. In this case, however, the sum of transport indices shown on the labels is limited to 10. A package must not weigh more than 50 kg.

C. PARTICULARS IN THE CONSIGNMENT NOTE

461

(1) The description of the goods in the consignment note must read: "*Radioactive substances*"; it must be *underlined in red* and followed by *particulars of the Class, the item number (together with the letter, if any) and the initials "RID"* [e.g. *IV b, item 1 (a), RID*]. This description must be followed by the words "*The nature of the merchandise and the packaging are in conformity with the provisions of RID*".

(2) The consignment note must also include the following particulars for each package:

- (a) The Group or Groups of the radionuclides contained in the radioactive substances despatched;
- (b) The names of the radioactive substances, a description of their physical and chemical state and, in the case of a radioactive substance in a special form, an indication whether that substance is in the form indicated under (a) or in that indicated under (b) of marg. 450, note 4;
- (c) The activity in curies (or in microcuries, millicuries or kilocuries, on condition that the prefixes "micro", "milli" and "kilo" are written in full);
- (d) The Category of package (I-WHITE, II-YELLOW, III-YELLOW);
- (e) The transport index (for Categories II-YELLOW and III-YELLOW);
- (f) The type of packaging (industrial, A or B);
- (g) For consignments of fissile substances:
  - (i) In the case of exemption provided for in marg. 456 (2) (a), (c) or (d): the quantity in grams, concentration, U-235 enrichment, as appropriate;
  - (ii) In other cases, the Nuclear Safety Class to which the package belongs, in conformity with marg. 456 (5).

(3) The following shall be annexed to the consignment note if necessary and as appropriate:

- (a) 1. A copy of the certificate of approval of the packaging design, in the case of substances referred to in marg. 450, note 3;
- 2. A copy of the certificate of approval or validation of a packaging design of type B [see marg. 452 (7) (c) (i)]; or an excerpt from that certificate showing the identification mark of the approved model;
- 3. A copy of the certificate of approval of the capsule design [see marg. 454 (3)];
- 4. A copy of the certificate of approval of the package design for substances of items 2 and 4 [see marg. 455 (5)], accompanied, where appropriate, by copies of the certificates of approval or validation issued by competent

\* Where a consignment consists of packages whose "permissible numbers" differ, the maximum number of packages to be accepted for carriage should be such that the sum  $\frac{n_1}{N_1} + \frac{n_2}{N_2} + \frac{n_3}{N_3} + \dots$  etc. does not exceed 1,  $n_1, n_2, n_3 \dots$  representing the number of packages whose "permissible numbers" are  $N_1, N_2, N_3 \dots$  respectively.

authorities other than the authority which issued the original certificate [see marg. 455 (7) (b)];

5. A copy of the certificate of approval of the package design for fissile substances of items 3 and 4 [see marg. 456 (11) (c)], accompanied, where appropriate, by copies of the certificates of approval or validation issued by competent authorities other than the authority which issued the original certificate [see marg. 456 (11) (f)].
- (b) 1. A copy of the certificate of approval of carriage of substances of item 2 [see marg. 455 (8) (c)], accompanied, where appropriate, by copies of the approvals or validations of competent authorities other than the authority which issued the original certificate [see marg. 455 (9) (c)];
2. A copy of the certificate of approval of carriage of packages of Nuclear Safety Class I and of Nuclear Safety Class II containing substances of item 4, and of packages of Nuclear Safety Class III [see marg. 456 (12)], accompanied, in the case of packages of Nuclear Safety Class III, or of packages of Nuclear Safety Class I or Nuclear Safety Class II containing substances of item 4 and the approval of whose design is referred to in marg. 455 (6), by copies of the approvals or validations of competent authorities other than the authority which issued the original certificate [see marg. 456 (12) (b) 3.];
  3. In the case of packages of Nuclear Safety Class III the loading of which together with other consignments is prohibited [see marg. 456 (12) (b) 3.], an instruction to that effect.

#### D. TRANSPORT EQUIPMENT

##### 1. *Conditions relating to wagons and their loading*

###### a. *For packages*

462

(1) Packages of radioactive substances loaded in a wagon must be securely stowed.

(2) (a) In the case of packages carried in less than full wagon loads the number of packages to be loaded in the same wagons shall be so limited that the sum of the transport indices shown on the labels does not exceed 50. Where limitation is made by reference to the red bands marked on the labels, a package of Category II-YELLOW and a package of Category III-YELLOW are to be considered equivalent respectively to a transport index of 0.5 and a transport index of 10.

(b) In the case of full wagon loads, the above-mentioned limit may be exceeded. However, in the case of packages of Nuclear Safety Class II, the number of packages loaded in the same wagon must not exceed the "permissible number"\* [see marg. 456 (10) (b)].

(c) In the case of express parcels to be loaded in the same van, the sum of transport indices shown on the labels is limited to 10. Where limitation is made by reference to the red bands, see under (a).

(3) The packages of Category II-YELLOW or Category III-YELLOW shall be separated from packages bearing a label with the word "FOTO" by the safety distances indicated in the table in Appendix VI, marg. 1605.

\* Where a consignment consists of packages whose "permissible numbers" differ, the maximum number of packages to be accepted for carriage should be such that the sum  $\frac{n_1}{N_1} + \frac{n_2}{N_2} + \frac{n_3}{N_3} + \dots$ , etc., does not exceed 1,  $n_1, n_2, n_3 \dots$  representing the number of packages whose "permissible numbers" are  $N_1, N_2, N_3 \dots$  respectively.

(4) After unloading, wagons which have contained substances of item 5, carried in accordance with marg. 457 (3), shall, if necessary, unless they are intended to carry the same substances, be decontaminated by the consignee, so that:

- (a) Their total contamination (fixed and non-fixed) does not exceed the levels indicated in the table in Appendix VI, marg. 1604, or
- (b) Their non-fixed contamination is below the levels indicated in the table in Appendix VI, marg. 1604; the wagon must be declared safe by a qualified person.

b. *For carriage in bulk*

463 (1) Substances of low specific activity referred to in marg. 457 (1) may be loaded in bulk provided that in normal carriage there can be no leakage of the substances outside of the wagon.

Substances referred to in marg. 457 (1) (b) and in the form of a massive solid shall be so stowed as to prevent movement of any kind liable to cause abrasion of the substance; if they are in some other compact solid form, they must be placed in an inert metal vessel or in a sheathing of other resistant materials so that the surfaces of the substances are not exposed.

If the substances referred to in marg. 457 (1) (d) contain fissile substances, the limits specified in marg. 456 (2) (a), (c) and (d) must be observed in the case of each wagon.

(2) Consignments shall be effected in such a form and in such quantities that the estimated total activity and the dose rate in respect of each wagon do not exceed the limits indicated in marg. 457 (4) and (5).

(3) After loading, the outer surfaces of wagons handed over for carriage shall be carefully cleaned by the sender.

(4) After unloading, wagons which have carried radioactive substances in bulk, unless they are intended to carry the same substances, shall, if necessary, be decontaminated by the consignee in such a way as to comply with the regulations of marg. 462 (4).

c. *For tank wagons*

464 (1) Substances of low specific activity covered by marg. 457 (1) (c) and other substances covered by marg. 457 (1) (a), (b) and (d) when they are liquid, dissolved or in suspension in liquids, or both dissolved and in suspension, may be carried in tank wagons.

(2) Substances of low specific activity which have a critical temperature lower than 50° C, or, at this temperature, a vapour pressure greater than 3 kg/cm<sup>2</sup>, or which are liable to spontaneous combustion, are not to be accepted for carriage in tank wagons.

(3) The materials of which the receptacles and closures are made must not be liable to attack by the contents or form harmful or dangerous compounds therewith.

(4) Receptacles must not have any openings (taps, valves, etc.) in their lower parts and must close hermetically.

(5) Receptacles shall be made of metal and shall be electrically earthed.

(6) Receptacles for substances referred to in (1) whose vapour pressure at 50° C exceeds 1.1 kg/cm<sup>2</sup> must comply with the regulations of marg. 311 (3) (c) and must be subjected to an internal hydraulic-pressure test by an expert approved



by the competent authority in the field of compressed gases. The pressure to be applied shall be:

- (a) 3 kg/cm<sup>2</sup> when they are intended for the carriage of liquids having a vapour pressure which does not exceed 1.75 kg/cm<sup>2</sup> at 50° C;
- (b) 4 kg/cm<sup>2</sup> when they are intended for the carriage of liquids having a vapour pressure greater than 1.75 kg/cm<sup>2</sup> at 50° C.

The hydraulic-pressure test shall be repeated at least every four years and an internal examination shall be carried out at the same time.

(7) Receptacles shall not be filled beyond 93% of their capacity.

(8) The regulations of marg. 463 (1), third subparagraph, (2) and (3) must be complied with. If the limits prescribed in marg. 463 (1), third subparagraph, are exceeded, the regulations of marg. 456 (3) to (13) shall apply, the tank wagon being considered in this respect as a package.

(9) After unloading, tank wagons which have carried radioactive substances shall, if necessary, unless they are intended to carry the same substances be decontaminated by the consignee, in such a way as to comply with the regulations of marg. 462 (4).

*d. For small containers*

465

(1) Packages containing substances of items 1 and 3 or substances of item 5 in packaging of the kind laid down for packages carried in less than full wagon loads may be carried in small containers of the closed type with complete sides under the following conditions:

- (a) If the small container contains only packages of Category I-WHITE, it shall be considered as belonging to this category itself; if it contains packages of Category II-YELLOW or Category III-YELLOW, with or without packages of Category I-WHITE, it shall be considered as belonging to Category III-YELLOW or Category II-YELLOW according to whether the total of the transport indices of the packages it contains is, or is not, above 0.5. The radiation dose rate of the small container must not exceed 200 mR/h or equivalent at any time during carriage at any point on the outer surface;
- (b) The small container shall be treated as a package of the category to which it is deemed to belong according to (a) above;
- (c) The total activity of the contents of the packages composed of type A packagings must not exceed the limits prescribed in marg. 457 (4); in addition, if the small container contains packages enclosing fissile substances, other than those of Nuclear Safety Classes I, II and III, the conditions specified in marg. 456 (2), (a), (c) or (d) must be complied with in the case of each small container;
- (d) The prohibitions on mixed loading laid down in marg. 467 must be applied to the contents of the small container to the same extent as to the wagons carrying them.

(2) Substances of item 5 may be carried in full wagon loads in small containers of the following types:

- (a) In the case of substances packed in accordance with marg. 457 (3): closed type with complete sides;
- (b) In the case of carriage in bulk: closed type with complete metal sides or special small containers manufactured so that, in normal carriage, there can be no leakage of substances.

(3) The following conditions are applicable:

- (a) The estimated total activity and the dose rate in respect of each wagon shall not exceed the limits prescribed in marg. 457 (4) and (5);
- (b) In the case of the substances indicated in marg. 457 (1) (b), the regulations of marg. 463 (1), second sub-paragraph, shall, if necessary, be observed;
- (c) In the case of the substances indicated under marg. 457 (1) (d) containing fissile substances, the limits specified in marg. 456 (2) (a), (c) or (d) shall be complied with in respect of each small container;
- (d) After loading, the outer surfaces of the small containers shall be carefully cleaned by the sender;
- (e) After unloading, the small containers shall, if necessary, unless they are intended to carry the same substances, be decontaminated by the consignee in such a way as to comply with the regulations of marg. 462 (4).

2. *Marking and danger labels on wagons and on small containers* (see Appendix IX)

466 (1) Wagons in which radioactive substances are loaded shall bear on both their sides a label conforming to model No. 6 D.

(2) Small containers in which packages of radioactive substances or articles are loaded in conformity with marg. 465 (1) shall bear a label conforming to model No. 6 A, 6 B or 6 C according to the category to which the small container is deemed to belong by virtue of the provisions of marg. 465 (1) above; the following shall be entered:

- (a) Against the word "contents":
  - (i) If all the packages have identical contents, the description of the contents as it appears on the labels affixed to packages themselves;
  - (ii) In other cases, the words "various radioactive substances of Groups . . .";
- (b) Against the word "activity" and as the transport index: the sum of the activities and the sum of the transport indices, respectively, of the packages loaded in the small containers.

E. PROHIBITIONS ON MIXED LOADING

467 Radioactive substances must not be loaded in the same wagon together:

- (a) With substances and articles of Class I a (marg. 21);
- (b) With articles of Class I b (marg. 61);
- (c) With substances and articles of Class I c (marg. 101);
- (d) With substances of Class II (marg. 201);
- (e) With substances of Class III a, items 1, 2 and 5 (marg. 301);
- (f) With substances of Class III c (marg. 371);
- (g) With substances of Class V, items 2 (a) and 3 (a) (marg. 501);
- (h) With substances of Class VII (marg. 701).

However, the prohibitions shall not apply to packages consisting of type-A packagings forwarded as express parcels.

468 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon [art. 6, para. 10 (d), of CIM].

## F. EMPTY PACKAGINGS

- 469 (1) Empty packagings which do not comply with the regulations of marg. 451 a 1. and 2. C are subject to the regulations applicable to packagings containing substances of this Class.
- (2) Empty receptacles of tank wagons must be closed as though they were full.

## G. OTHER REGULATIONS

- 470 (1) Packages of radioactive substances must not be stored in the same place as dangerous goods with which mixed loading is prohibited in conformity with marg. 467.
- (2) The number of packages of Category II-YELLOW or Category III-YELLOW stored in one place, such as a goods depot or store, shall be so limited that the sum of the transport indices shown on the labels does not exceed 50, unless the packages are in groups in each of which the sum of the transport indices does not exceed 50, and with a distance of at least 6 metres maintained between the groups during handling or storage. If limitation is made by reference to the red bands marked on the labels, a package of Category II-YELLOW and a package of Category III-YELLOW are to be considered equivalent respectively to a transport index of 0.5 and a transport index of 10.
- (3) Packages of Category II-YELLOW or Category III-YELLOW shall be separated in goods depots, in stations or on platforms by the safety distances prescribed in Appendix VI, marg. 1605, from packages which bear a label with the word "FOTO". Moreover, they must not be loaded together in the same handling trolley.
- (4) If a package containing radioactive substances is broken or is visibly leaking or is involved in an accident during carriage, the wagon or affected area shall be isolated so as to prevent all contact of persons with radioactive substances and, when possible, shall be duly marked off or surrounded by barriers. No one shall be authorised to stay within the isolated area until qualified persons arrive to supervise the handling and salvage work. The sender and the authorities concerned shall be notified immediately. Notwithstanding these provisions, the presence of radioactive substances should not be considered as a bar to operations for the rescue of people or fire-fighting.
- (5) If radioactive substances have leaked, have been spilled or have been scattered in any way whatever in a conveyance, place or area or on to goods or equipment used for carriage or storage, qualified persons shall be summoned as soon as possible to direct decontamination operations. The conveyance, place, area or equipment thus contaminated shall not be put back into service until its use has been declared free from danger by qualified persons.
- (6) Until 1 April 1971, type-B packagings for substances of item 1, manufactured before 1 April 1967 and approved in accordance with marg. 452 (4) of the edition of RID of 1 June 1962, are exempted from the approval covered under marg. 452 (7) of the present edition as long as they are used within the quantity limits laid down in marg. 454 (1) and (2) of the edition of RID of 1 June 1962; however, for radioactive substances in a special form, defined in marg. 450, note 4, the limit is raised to 5,000 Ci.

The original approval of the packaging design must be validated on the basis of a drop test of at least 4.5 m and a fire test of at least one half hour at 800° C and in accordance with the procedure specified in marg. 452 (7) of this RID, unless the packages are sent as a full wagon load.

## CLASS V. CORROSIVE SUBSTANCES

1. *List of substances*

**500** Among the substances and articles covered by the heading of Class V, those listed in marg. 501 or which come under a collective heading of this marginal are subject to the conditions set out in marg. 501 to 536 and are consequently substances and articles of RID.

**501** A. SUBSTANCES OF AN ACID NATURE(a) *Inorganic acids*1. *Sulphuric acid:*

- (a) Sulphuric acid containing more than 85% pure acid ( $\text{H}_2\text{SO}_4$ ) and *oleum* (*fuming sulphuric acid*);
- (b) Sulphuric acid containing more than 75% but not more than 85% pure acid ( $\text{H}_2\text{SO}_4$ );
- (c) Sulphuric acid containing not more than 75% pure acid ( $\text{H}_2\text{SO}_4$ );
- (d) *Waste sulphuric acid*, completely denitrated;

NOTE. Incompletely denitrated waste sulphuric acid is not to be accepted for carriage.

(e) *Lead sludge containing sulphuric acid;*

NOTE. Lead sludge containing less than 3% free acid is a substance of Class IV a (see marg. 401, item 73).

(f) *Storage batteries filled with sulphuric acid.*

For (a) to (d), see also marg. 501 a under (a).

2. *Nitric acid:*

- (a) Nitric acid containing more than 70% pure acid ( $\text{HNO}_3$ );
- (b) Nitric acid containing more than 55% but not more than 70% pure acid ( $\text{HNO}_3$ );
- (c) Nitric acid containing not more than 55% pure acid ( $\text{HNO}_3$ ).

For (a) to (c), see also marg. 501 a under (a) and (b).

3. *Mixed nitrating acids (sulphuric and nitric acids):*

- (a) Mixed nitrating acids containing more than 30% pure nitric acid ( $\text{HNO}_3$ );
- (b) Mixed nitrating acids containing not more than 30% pure nitric acid ( $\text{HNO}_3$ ).

NOTE. For waste mixed nitrating acids, see under item 1 (d).

For (a) and (b), see also marg. 501 a under (a) and (b).

4. *Perchloric acid* in aqueous solutions containing not more than 50% pure acid ( $\text{HClO}_4$ ). See also marg. 501 a under (a).

NOTE. Aqueous solutions of perchloric acid containing more than 50% but not more than 72.5% pure acid ( $\text{HClO}_4$ ) are substances of Class III c (see marg. 371, item 3). Solutions containing more than 72.5% pure acid are not to be accepted for carriage; the same applies to mixtures of perchloric acid with any liquid other than water.

5. *Hydrochloric acid solutions, hydrobromic acid solutions, hydriodic acid solutions, and mixtures of sulphuric and hydrochloric acids.* See also marg. 501 a under (a).

NOTE. 1. Mixtures of nitric acid with hydrochloric acid are not to be accepted for carriage.

2. Liquefied hydrogen bromide and hydrogen chloride, anhydrous are substances of Class I d (see marg. 131, items 5 and 10).

6. *Hydrofluoric acid* (aqueous solutions):

(a) Containing more than 60%, but not more than 85% pure acid (HF);

(b) Containing not more than 60% pure acid (HF).

NOTE. 1. Aqueous solutions containing more than 85% pure acid (HF) are not to be accepted for carriage.

2. Liquefied hydrogen fluoride is a substance of Class I d (see marg. 131, item 5).

For (a) and (b), see also marg. 501 a under (a).

7. *Fluoboric acid* [aqueous solutions containing not more than 78% pure acid (HBF<sub>4</sub>)]. See also marg. 501 a under (a).

NOTE. Solutions of fluoboric acid containing more than 78% pure acid (HBF<sub>4</sub>) are not to be accepted for carriage.

8. *Fluosilicic acid* [hydrofluosilicic acid (H<sub>2</sub>SiF<sub>6</sub>)]. See also marg. 501 a under (a).

9. *Sulphur trioxide*, stabilised. See also marg. 501 a under (a) and (c).

NOTE. Unstabilised sulphur trioxide is not to be accepted for carriage.

(b) *Inorganic halides, acid salts and similar halogenated substances*

11. Liquid halides, and similar halogenated substances, with the exception of compounds of fluorine, which, in contact with moist air or water, give off acid fumes such as:

(a) *Antimony pentachloride* (SbCl<sub>5</sub>), *chlorosulphonic acid* [SO<sub>2</sub>(OH)Cl], *disulphur dichloride* (sulphur chloride) (stabilised) (S<sub>2</sub>Cl<sub>2</sub>), *chromyl chloride* (*chromium oxychloride*) (CrO<sub>2</sub>Cl<sub>2</sub>), *phosphoryl chloride* (*phosphorus oxychloride*) (POCl<sub>3</sub>), *phosphorus trichloride* (PCl<sub>3</sub>), *silicon tetrachloride* (SiCl<sub>4</sub>), *sulphuryl chloride* (SO<sub>2</sub>Cl<sub>2</sub>), *thionyl chloride* (SOCl<sub>2</sub>), *titanium tetrachloride* (TiCl<sub>4</sub>) and *stannic chloride* (SnCl<sub>4</sub>);

NOTE. Unstabilised disulphur dichloride is not to be accepted for carriage.

(b) *Phosphorus tribromide* (PBr<sub>3</sub>), *pyrosulphuryl chloride* (S<sub>2</sub>O<sub>5</sub>Cl<sub>2</sub>), and *thiophosphoryl chloride* (PSCl<sub>3</sub>).

For (a) and (b), see also marg. 501 a under (a).

12. Solid halides and similar halogenated substances, with the exception of compounds of fluorine, which, in contact with moist air or water, give off acid fumes such as:

*Aluminium chloride* (anhydrous) (AlCl<sub>3</sub>), *antimony trichloride* (technical) (SbCl<sub>3</sub>), *phosphorus pentachloride* (PCl<sub>5</sub>) and *zinc chloride* (ZnCl<sub>2</sub>). See also marg. 501 a under (a) and (d).

NOTE. Non-anhydrous aluminium chloride is not to be accepted for carriage.

13. *Bisulphates* (acid sulphates). See also marg. 501 a under (a).

NOTE. Bisulphates are not subject to the regulations of RID when the sender certifies in the consignment note that the products are free from sulphuric acid and are dry.

14. *Bromine*. See also marg. 501 a under (a).

15. The following compounds of fluorine:
- (a) *Difluorides (bifluorides, acid fluorides)*;
  - (b) *Ammonium fluoride, chromic fluoride, antimony pentafluoride*;
  - (c) *Boron trifluoride-acetic acid complex, boron trifluoride-propionic acid complex*;
  - (d) *Bromine trifluoride (BrF<sub>3</sub>), bromine pentafluoride (BrF<sub>5</sub>)*.  
For (a) to (d), see also marg. 501 a under (a).
  - (c) *Organic substances*
21. The following acids:
- (a) Chloroacetic acids;
    - 1. *Monochloroacetic and trichloroacetic acids (solids)*;
    - 2. *Dichloroacetic acid (liquid) and mixtures of chloroacetic acids*;
  - (b) *Formic acid containing at least 70% pure acid*;
  - (c) *Glacial acetic acid and its aqueous solutions containing more than 80% pure acid*;
  - (d) *Propionic acid containing more than 80% pure acid*;
  - (e) *Acetic anhydride*.  
For (a) to (e), see also marg. 501 a under (a).
22. Liquid acid halides, such as:  
*Acetyl chloride and benzoyl chloride*. See also marg. 501 a under (a).
23. Alkyl and aryl chlorosilanes:
- (a) *Alkyl and aryl chlorosilanes having a flash-point 1 below 21° C*;
  - (b) *Alkyl and aryl chlorosilanes having a flash-point of 21° C or above*.
- NOTE. Substances of this item which give off inflammable gases on contact with water are not to be accepted for carriage.  
For (a) and (b), see also marg. 501 a under (a).
- B. SUBSTANCES OF A BASIC CHARACTER**
31. (a) *Sodium hydroxide and potassium hydroxide (caustic soda, caustic potash), in lumps, in flakes or in powdered form*. See also marg. 501 a under (a);
- (b) *Sodium hydroxide filled in the molten state*.
32. *Sodium hydroxide and potassium hydroxide in solutions (soda lye, potash lye), also in mixtures (caustic lyes), alkaline solutions of phenol, cresols and xylenols, alkaline residues from oil refineries*. See also marg. 501 a under (a).
33. *Storage batteries filled with alkaline solutions*. See also marg. 501 a under (e).
34. *Hydrazine in aqueous solutions containing not more than 72% hydrazine (N<sub>2</sub>H<sub>4</sub>)*. See also marg. 501 a under (a).
- NOTE. Aqueous solutions containing more than 72% hydrazine (N<sub>2</sub>H<sub>4</sub>) are not to be accepted for carriage.
35. Alkyl and aryl amines and polyamines, such as:  
*1,2-diaminoethane (ethylenediamine), 1,6-diaminohexane (hexamethylenediamine), triethylenetetramine*. See also marg. 501 a under (a).

36. *Sodium sulphide* containing not more than 70% Na<sub>2</sub>S.

NOTE. Sodium sulphide containing more than 70% Na<sub>2</sub>S is not to be accepted for carriage.

37. *Hypochlorite solutions*:

(a) Hypochlorite solutions containing more than 50 g of available chlorine per litre;

(b) Hypochlorite solutions containing not more than 50 g of available chlorine per litre.

For (a) and (b), see also marg. 501 a under (a).

C. OTHER CORROSIVE SUBSTANCES

41. *Solutions of hydrogen peroxide*:

(a) Aqueous solutions of hydrogen peroxide containing more than 40% but not more than 60% hydrogen peroxide;

(b) Aqueous solutions of hydrogen peroxide containing more than 6% but not more than 40% hydrogen peroxide.

For (a) and (b), see also marg. 501 a under (a).

NOTE. Hydrogen peroxide and its aqueous solutions containing more than 60% hydrogen peroxide are substances of Class III c (see marg. 371, item 1).

D. EMPTY RECEPTACLES

51. *Empty packagings*, uncleaned, including receptacles of tank wagons and small tank containers, which have contained substances of Class V, except for those of items 13 and 36.

501a Substances handed over for carriage in conformity with the following provisions are not subject to the regulations of chapter 2 "Conditions of carriage":

(a) Substances of items 1 (a) to (d), 2 (b) and (c), 3 (b), 4 to 9, 11 to 15, 21 to 23, 31 (a), 32, 34, 35, 37 and 41, in quantities not exceeding 1 kg for each substance, on condition that they are packed in leakproof receptacles incapable of being attacked by the contents and that these receptacles are packed with care in strong, leakproof wooden packagings with leakproof closures;

(b) Substances of items 2 (a) and 3 (a), in quantities not exceeding 200 g for each substance, on condition that they are packed in leakproof receptacles incapable of being attacked by the contents and that these receptacles are secured, not more than 10 per case, in wooden cases with inert absorbent cushioning material;

(c) Sulphur trioxide (item 9), whether or not mixed with a small quantity of phosphoric acid, on condition that it is packed in strong sheet-metal boxes, weighing not more than 15 kg, hermetically closed and fitted with a handle;

(d) Phosphorus pentachloride (item 12), compressed into blocks weighing not more than 10 kg each on condition that these blocks are packed in welded and airtight sheet-metal boxes placed, either singly or in groups, in a crate, a case or a small container;

(e) Metal-cased storage batteries filled with alkaline solution (item 33), on condition that they are so closed as to prevent leakage of the solution and are protected against short circuits.

## 2. *Conditions of carriage*

(The regulations relating to empty receptacles are to be found under F.)

### A. PACKAGES

#### 1. *General conditions for packing*

502

(1) Packagings shall be so closed and arranged as to prevent any loss of the contents. For the special regulation relating to storage batteries [items 1 (f) and 33], see marg. 504 and 516; for hypochlorite solutions of item 37 and hydrogen peroxide of item 41, see marg. 520 and 521 respectively.

(2) The materials of which the packagings and their closures are made must not be liable to attack by the contents, or cause the contents to decompose, or form harmful or dangerous compounds therewith.

(3) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. In particular, where substances are in the liquid state or in solution, receptacles and their closures must, unless the section headed "Packing of individual substances" provides otherwise, be able to withstand any pressure which, the presence of air also being taken into account, may arise inside the receptacles in normal carriage. For this purpose, a free space must be left, account being taken of the difference between the temperature of the substances at the time of filling and the highest mean temperature which they are likely to reach during carriage. Inner packagings shall be firmly secured in outer packagings. Unless otherwise specified in the section "Packing of individual substances", inner packagings may be enclosed in outer packagings, either singly or in groups.

(4) Bottles and other glass receptacles must be free from faults liable to impair their strength; in particular, internal stresses must have been suitably relieved. The walls must be not less than 3 mm thick in the case of receptacles weighing, with their contents, more than 35 kg and not less than 2 mm in the case of other receptacles.

The tightness of the closure system must be ensured by an additional device (cap, crown, seal, binding, etc.) capable of preventing any loosening of the closure system during carriage.

(5) When receptacles made of glass, porcelain, stoneware or similar materials, or of a suitable plastics material, are prescribed or allowed, they must, in the absence of any provision to the contrary, be provided with protective packagings. Receptacles made of glass, porcelain, stoneware or similar materials shall be carefully secured therein by cushioning material. Cushioning material shall be suited to the nature of the contents.

#### 2. *Packing of individual substances*

503

(1) Substances of items 1 (a) to (e) and 2 to 5 shall be packed:

(a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar material, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or

(b) In hermetically closed cylindrical receptacles made of glass, porcelain, stoneware or similar material. These receptacles shall be secured by absorbent



cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg; or

- (c) In hermetically closed glass carboys, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength, or firmly fixed in iron or wicker hampers. The carboys shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg.

(2) Substances of items 1 (a) to (e), 2 and 3 may also be packed in hermetically closed metal drums having a suitable lining in the case of substances of item 1 (b), (c), (d) and (e) and a lining only if necessary in the case of substances of items 2 and 3. The drums shall not be filled beyond 95% of their capacity. If, with their contents, they weigh more than 275 kg they shall be fitted with rolling hoops.

(3) Substances of items 1 (a) to (e), 2 and 5 may also be packed in hermetically closed receptacles made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg.

(4) Substances of item 5 may also be packed in hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres, with walls of sufficient thickness, which shall be not less than 4 mm in the case of receptacles of 50 litres or over; the openings shall be closed by two plugs, one placed over the other, one of them being screw-threaded. These receptacles need have no protective packaging if the competent authority of the country of departure so allows. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg.

(5) In the case of substances of items 2 (a), 3 (a) and 4, the absorbent cushioning material must be incombustible; in the case of substances of item 2 (b), it shall be fire-resistant.

(6) For the carriage of substances of items 1 (a) to (d) and 2 to 5 in tank wagons and small tank containers, see marg. 529 and 530 (3).

504

Storage batteries filled with sulphuric acid [item 1 (f)] shall be secured in battery cases. The batteries shall be protected against short circuits and be secured by absorbent cushioning material in a wooden packing case. Packing cases shall be fitted with means of handling.

Nevertheless, if the storage batteries are made of a shock-resistant material and their upper part is so designed that the acid cannot splash out in dangerous quantities, the batteries need not be packed, but they must be protected against any short circuit, sliding, falling or damage, and be fitted with means of handling. No dangerous quantities of acid must appear on the outside of packages.

Similarly, storage batteries forming part of the equipment of vehicles need not have special packaging if the vehicles are securely fixed to the wagons.

505

(1) Substances of items 6, 7 and 8 shall be packed:

- (a) In hermetically closed metal receptacles, with a suitable lining if necessary, of a capacity not exceeding 15 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 90% of their capacity. Such a package must not weigh more than 100 kg; or

- (b) In hermetically closed metal drums, with a suitable lining if necessary. The drums shall not be filled beyond 90% of their capacity. If, with their contents, they weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (c) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength. The receptacles shall not be filled beyond 90% of their capacity. Such a package must not weigh more than 100 kg.
- (2) For the carriage of substances of items 6 and 7 in tank wagons and small tank containers, see marg. 529 and 530 (3).
- 506** (1) Sulphur trioxide (item 9) shall be packed:
- (a) In soldered receptacles made of black sheet-iron or tinplate, or in hermetically closed bottles made of black sheet-iron, tinplate or copper; or
- (b) In flame-sealed glass receptacles, or in hermetically closed receptacles made of porcelain, stoneware or similar materials; or
- (c) In steel drums which have been pressure-tested at 1.5 kg/cm<sup>2</sup>.
- (2) The receptacles referred to in (a) and (b) above shall be secured by incombustible and absorbent cushioning material in packagings made of wood, black sheet-iron or tinplate.
- (3) For carriage in tank wagons, see marg. 529.
- 507** (1) Substances of item 11 shall be packed:
- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar material, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In hermetically closed metal drums, with a suitable lining if necessary. The drums shall not be filled beyond 95% of their capacity. If, with their contents, they weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (c) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (d) In hermetically closed glass carboys, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The carboys shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg.
- (2) For the carriage of the named substances of item 11 (a) in tank wagons and small tank containers, see marg. 529 and 530 (3).
- 508** (1) Substances of item 12 shall be packed:
- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar material, or of a suitable plastics material, which must not contain more than 5 kg of substance each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or

- (b) In hermetically closed metal receptacles, with a suitable lining if necessary, which must not contain more than 15 kg of substance each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 100 kg; or
- (c) In hermetically closed metal drums, with a suitable lining if necessary. If the drums, with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (d) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength. Such a package must not weigh more than 100 kg; or
- (e) In hermetically closed wooden casks of sufficient strength, with a suitable lining. Such a package must not weigh more than 250 kg;
- (f) Zinc chloride may also be packed in hermetically closed bags, made of a suitable plastics material, which shall be placed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg.

(2) For the carriage of antimony trichloride in tank wagons and small tank containers, see marg. 529 and 530 (3).

509

(1) Substances of items 13 and 15 shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar material, or of a suitable plastics material, which must not contain more than 5 kg of substance each; however, glass receptacles are not accepted for fluorides of item 15. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
- (b) In hermetically closed metal receptacles, with a lead lining if necessary, which must not contain more than 15 kg of substance each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 100 kg; or
- (c) In hermetically closed metal drums, with a lead lining if necessary. If the drums, with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (d) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength. Such a package must not weigh more than 100 kg; or
- (e) In hermetically closed bags, made of a suitable plastics material, which shall be placed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
- (f) In hermetically closed wooden casks of sufficient strength, with a suitable lining. Such a package must not weigh more than 250 kg; or
- (g) In stout four-ply paper bags, lined with a hermetically closed bag made of a suitable plastics material. Such a package must not weigh more than 55 kg.

(2) For the carriage in bulk of bisulphates (item 13), see marg. 528 and 530 (4); for the carriage of antimony pentafluoride of item 15 (b) in tank wagons and small tank containers, see marg. 529 and 530 (3).

510 (1) Bromine (item 14) shall be packed in suitable receptacles containing not more than 7.5 kg of substance per receptacle.

(2) Bromine containing less than 0.005% water, or between 0.005% and 0.2% water provided that in the latter case measures are taken to prevent corrosion of the lining of the receptacles, may also be carried in receptacles satisfying the following conditions:

- (a) The receptacles shall be made of steel and be equipped with a leakproof lining made of lead or of some other material affording equivalent protection, and with hermetic closures; receptacles made of Monel metal or nickel, or equipped with a nickel lining, shall also be permitted;
- (b) Their capacity must not exceed 1,250 litres;
- (c) The receptacles shall not be filled beyond 92% of their capacity or beyond 2.86 kg per litre of capacity;
- (d) The receptacles shall be welded and designed for a pressure of not less than 21 kg/cm<sup>2</sup>.

The materials and workmanship must in other respects meet the requirements of marg. 141 (1) and (2) (b). The initial test of unlined steel receptacles shall be subject to the provisions of marg. 145 (1) and 146 (1), A and B.

- (e) The closing devices must project as little as possible from the receptacle and be fitted with a protective cap. The closing devices and the cap shall be fitted with gaskets made of a material not capable of being attacked by bromine. The closing devices must be in the upper part of the receptacles, so that they can in no case be in permanent contact with the liquid;
- (f) The lead lining must be leakproof and be not less than 3 mm thick. If some other material is used, it must provide protection equivalent to that provided by lead;
- (g) The receptacles must be provided with fittings enabling them to stand stably upright, and with lifting attachments (rings, flanges, etc.) on their upper part, which must be tested at twice the working load.

(3) Receptacles in conformity with (2) above shall, before being put into service, be subjected to a tightness test at a pressure of 2 kg/cm<sup>2</sup>. The tightness test shall be repeated every two years and shall be accompanied by an internal inspection of the receptacle and a check of its tare. This test and this inspection shall be supervised by an expert approved by the competent authority.

(4) The receptacles must bear, in clearly legible and indelible characters:

- (a) The name or mark of the maker and the number of the receptacle;
- (b) The word "Bromine";
- (c) The tare of the receptacle and its maximum weight when filled;
- (d) The date (month and year) of the last test undergone;
- (e) The stamp of the expert who carried out the test and the inspections.

(5) For the carriage of bromine in tank wagons, see marg. 529.

511 (1) Substances of item 21 (a) 1. shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar material, or of a suitable plastics material, which must not contain more than 5 kg of substance each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or

- (b) In hermetically closed metal receptacles, with a suitable lining if necessary, which must not contain more than 15 kg of substance each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 100 kg; or
- (c) In hermetically closed metal drums, with a suitable lining if necessary. If the drums, with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (d) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength. Such a package must not weigh more than 100 kg; or
- (e) In hermetically closed bags, made of a suitable plastics material, which shall be placed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or
- (f) In hermetically closed wooden casks of sufficient strength, with a suitable lining. Such a package must not weigh more than 250 kg; or
- (g) In stout four-ply paper bags, lined with a hermetically closed bag made of a suitable plastics material. Such a package must not weigh more than 55 kg; or
- (h) In jute bags rendered moisture-proof by a lining made of a suitable material, coated with bitumen, or in jute bags lined with a hermetically closed bag made of a suitable plastics material. Such a package must not weigh more than 55 kg.

(2) Substances of item 21 (a) 2., (b), (c), (d) and (e) shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar material, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In hermetically closed glass carboys, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The carboys shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg; or
- (c) In hermetically closed metal receptacles, with a suitable lining if necessary, of a capacity not exceeding 15 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (d) In hermetically closed canisters made of a suitable metal, welded or hard-soldered, of a capacity not exceeding 60 litres and fitted with means of handling. The canisters shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg; or
- (e) In hermetically closed metal drums, with a suitable lining if necessary. The drums shall not be filled beyond 95% of their capacity. If, with their contents, they weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (f) In hermetically closed receptacles made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and

tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or

- (g) In hermetically closed receptacles, made of a suitable plastics material of a capacity not exceeding 60 litres, with walls of sufficient thickness, which shall be not less than 4 mm in the case of receptacles of 50 litres or over; the openings shall be closed by two plugs, one placed over the other, one of them being screw-threaded. These receptacles need have no protective packagings if the competent authority of the country of departure so allows. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg.

(3) For the carriage of substances of item 21 (b) in tank wagons and small tank containers, and of substances of item 21 (c) and (e) in tank wagons, see marg. 529 and 530 (3).

**512**

(1) Substances of item 22 shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar material, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In hermetically closed metal drums, with a suitable lining if necessary. The drums shall not be filled beyond 95% of their capacity. If, with their contents, they weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (c) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength. Receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (d) In hermetically closed glass carboys, which shall be secured by absorbent cushioning materials in a wooden case or in some other outer packaging of sufficient strength. The carboys shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg.

(2) For the carriage of acetyl chloride and benzoyl chloride in tank wagons and small tank containers, see marg. 529 and 530 (3).

**513**

(1) Substances of item 23 shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar material, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In hermetically closed metal receptacles, with a suitable lining if necessary, of a capacity not exceeding 15 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or

(c) In hermetically closed metal drums, with a suitable lining if necessary. Drums intended to hold substances of item 23 (a) must satisfy the requirements of Appendix V. The drums shall not be filled beyond 95% of their capacity. If, with their contents, they weigh more than 275 kg, they shall be fitted with rolling hoops.

(2) Substances of item 23 (b) may also be packed:

(a) In hermetically closed canisters made of a suitable metal, welded or hard-soldered, of a capacity not exceeding 60 litres and fitted with means of handling. The canisters shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg; or

(b) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres, with walls of sufficient thickness, which shall be not less than 4 mm in the case of receptacles of 50 litres or over; the openings shall be closed by two plugs, one placed over the other, one of them being screw-threaded. These receptacles need have no protective packaging if the competent authority of the country of departure so allows. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg.

(3) For carriage in tank wagons, see marg. 529.

514

(1) Substances of item 31 (a) shall be packed:

(a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar material, or of a suitable plastics material, which must not contain more than 5 kg of substance each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or

(b) In hermetically closed metal receptacles, with a suitable lining if necessary, which must not contain more than 15 kg of substance each. These receptacles shall be secured by cushioning material in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 100 kg; or

(c) In hermetically closed metal drums, with a suitable lining if necessary. If the drums, with their contents, weigh more than 275 kg, they shall be fitted with rolling hoops; or

(d) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength. Such a package must not weigh more than 100 kg; or

(e) In hermetically closed bags, made of a suitable plastics material, which shall be placed in a wooden case or in some other outer packaging of sufficient strength. Such a package must not weigh more than 75 kg; or

(f) In jute bags rendered moisture-proof by a lining made of a suitable material, coated with bitumen, or in jute bags lined with a hermetically closed bag made of a suitable plastics material. Such a package must not weigh more than 55 kg.

(2) Substances of item 31 (a) in flakes or in powdered form may also be packed in stout four-ply paper bags, lined with a hermetically closed bag made of a suitable plastics material. Such a package must not weigh more than 55 kg.

(3) Sodium hydroxide of item 31 (b) filled in the molten state shall be contained in steel drums with walls not less than 0.5 mm thick. The drums, with their contents, must not weigh more than 450 kg.

515

(1) Substances of item 32 shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar material, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In hermetically closed metal receptacles, with a suitable lining if necessary, of a capacity not exceeding 15 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (c) In hermetically closed canisters made of a suitable metal, welded or hard-soldered, of a capacity not exceeding 60 litres, and fitted with means of handling. The canisters shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg; or
- (d) In hermetically closed metal drums, with a suitable lining if necessary. The drums shall not be filled beyond 95% of their capacity. If, with their contents, they weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (e) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paper-board or of some other material of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (f) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres, and with walls of sufficient thickness, which shall be not less than 4 mm in the case of receptacles of 50 litres or over; the openings shall be closed by two plugs, one placed over the other, one of them being screw-threaded. These receptacles need have no protective packaging if the competent authority of the country of departure so allows. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (g) In hermetically closed cylindrical receptacles made of glass, porcelain, stoneware or similar material, of a capacity not exceeding 20 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg; or
- (h) In hermetically closed glass carboys, which shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength, or be firmly fixed in iron or wicker hampers. The carboys shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg.

(2) For carriage in tank wagons and small tank containers, see marg. 529 and 530 (3).

516

Storage batteries filled with alkaline solutions (item 33) shall be made of metal and the upper part shall be so designed that the lye cannot splash out in dangerous quantities. The batteries shall be protected against short-circuits and be packed in a wooden packing case.



517

(1) Hydrazine (item 34) shall be packed:

- (a) In hermetically closed glass receptacles, of a capacity not exceeding 5 litres, which shall be secured by suitable cushioning material in boxes placed in a wooden case; or
- (b) In receptacles made of aluminium not less than 99.5% pure or of stainless steel or of lead-lined iron; or
- (c) In receptacles, made of a suitable plastics material, fitted with a screw closure and having a capacity not exceeding 65 litres, placed singly in suitable protective packagings or secured in groups by suitable cushioning material in suitable protective packagings; a package must not weigh more than 100 kg, or more than 50 kg if the protective packaging consists of a fibreboard case; or
- (d) In drums, made of a suitable plastics material, of a capacity not exceeding 220 litres and with walls not less than 1.5 mm thick, placed singly in drums fitted with rolling hoops.

(2) No receptacle shall be filled beyond 93% of its capacity. The receptacles under (b), (c) and (d) shall be pressure-tested at 1 kg/cm<sup>2</sup>.

(3) For carriage in tank wagons and small tank containers, see marg. 529 and 530 (3).

518

(1) Substances of item 35 shall be packed:

- (a) In hermetically closed receptacles made of glass, porcelain, stoneware or similar material, or of a suitable plastics material, of a capacity not exceeding 5 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg. Packages weighing more than 30 kg, other than those forwarded as a full load, shall be fitted with means of handling; or
- (b) In hermetically closed metal receptacles, with a suitable lining if necessary, of a capacity not exceeding 15 litres. These receptacles shall be secured by absorbent cushioning material in a wooden case or in some other outer packaging of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (c) In hermetically closed canisters made of a suitable metal, welded or hard-soldered, of a capacity not exceeding 60 litres, and fitted with means of handling. The canisters shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 75 kg; or
- (d) In hermetically closed metal drums, with a suitable lining if necessary. The drums shall not be filled beyond 95% of their capacity. If, with their contents, they weigh more than 275 kg, they shall be fitted with rolling hoops; or
- (e) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres. These receptacles shall be placed singly and tightly in a protective packaging with complete sides, made of paperboard or of some other material of sufficient strength. The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg; or
- (f) In hermetically closed receptacles, made of a suitable plastics material, of a capacity not exceeding 60 litres, with walls of sufficient thickness, which shall be not less than 4 mm in the case of receptacles of 50 litres or over; the openings shall be closed by two plugs, one placed over the other, one of them being screw-threaded. These receptacles need have no protective packaging if the competent authority of the country of departure so allows.

The receptacles shall not be filled beyond 95% of their capacity. Such a package must not weigh more than 100 kg.

(2) For carriage in tank wagons and small containers, see marg. 529 and 530 (3).

519

(1) Sodium sulphide (item 36) shall be packed:

(a) In leakproof iron receptacles; or

(b) In quantities not exceeding 5 kg, also in receptacles, made of glass or of a suitable plastics material, which shall be secured in strong wooden receptacles, glass receptacles being secured therein by cushioning material.

(2) Sodium sulphide in solid form may also be enclosed in other leakproof receptacles. If carried as a full load, it may also be packed:

(a) In stout five-ply paper bags, so closed as to be leakproof and lined with a bag made of a suitable plastics material; or

(b) In bags made of a suitable plastics material equal in strength to the paper bags.

Packages made up of bags must not weigh more than 55 kg.

520

(1) Hypochlorite solutions (item 37) shall be packed:

(a) In receptacles made of glass, porcelain, stoneware or similar material, or of a suitable plastics material, secured in protective packagings; fragile receptacles shall be secured therein by cushioning material; or

(b) In metal drums, suitably lined.

(2) In the case of hypochlorite solutions of item 37 (a), the receptacles or drums shall be so designed as to allow gases to escape, or shall be fitted with pressure-relief valves.

(3) For carriage in tank wagons, see marg. 529.

521

(1) Aqueous solutions of hydrogen peroxide containing more than 40% but not more than 60% hydrogen peroxide [item 41 (a)] shall be contained:

(a) In receptacles, which must be able to stand stably upright, made of aluminium not less than 99.5% pure or of a special steel not liable to cause the hydrogen peroxide to decompose. The capacity of these receptacles must not exceed 200 litres; or

(b) In receptacles, made of glass, porcelain, stoneware or a suitable plastics material, of a capacity not exceeding 20 litres. Each receptacle shall be secured by absorbent, incombustible and inert cushioning material in a sheet-steel packaging with complete sides, lined with suitable materials. This packaging shall be placed in a wooden packing case with a sloping protective cover.

For closure and degree of filling, see under (3).

(2) Aqueous solutions of hydrogen peroxide containing more than 6% but not more than 40% hydrogen peroxide [item 41 (b)] shall be contained in receptacles made of glass, porcelain, stoneware, aluminium not less than 99.5% pure, special steel not liable to cause the hydrogen peroxide to decompose, or a suitable plastics material.

Receptacles of a capacity not exceeding 3 litres shall be secured by cushioning material in wooden cases; if the receptacles contain aqueous solutions of hydrogen peroxide containing more than 35% hydrogen peroxide, the cushioning material must be suitably fire-proofed. A package must not weigh more than 35 kg.

If the receptacles have a capacity of more than 3 litres they must satisfy the following conditions:

- (a) Receptacles made of aluminium or of special steel must be able to stand stably upright. A package must not weigh more than 250 kg;
- (b) Receptacles made of glass, porcelain, stoneware or a suitable plastics material shall be placed in suitable strong protective packagings which will keep them securely upright; the packagings shall be fitted with means of handling. Inner receptacles other than those made of a plastics material shall be secured in outer packagings by cushioning material. Where receptacles contain aqueous solutions of hydrogen peroxide containing more than 35% but not more than 40% hydrogen peroxide, the cushioning material shall be suitably fireproofed. A package of this kind must not weigh more than 90 kg; however, it may weigh up to 110 kg if the protective packagings are, in addition, packed in a case or crate;
- (c) Aqueous solutions of hydrogen peroxide containing more than 6% but not more than 40% hydrogen peroxide may also be contained, without protective packagings, in receptacles made of a suitable plastics material, provided that the thickness of the walls (including areas recessed for labelling) is not at any point less than 4 mm, the walls are protected by strong ribs, and the ends are reinforced. The receptacles shall be fitted with means of handling. The capacity must not exceed 60 litres.

For closure and degree of filling, see under (3).

(3) Receptacles of a capacity not exceeding 3 litres may have a hermetic closure. In such cases the receptacles shall be filled with a weight of solution which, expressed in grams, is equal to not more than two thirds of the figure expressing the capacity of the receptacle in  $\text{cm}^3$ .

Receptacles of a capacity exceeding 3 litres shall be fitted with a special closure preventing excess internal pressure, leakage of the liquid, and the entry of foreign matter into the receptacle. Where receptacles are packed separately, the outer packaging shall be fitted with a cover which, while protecting the closure, makes it possible to verify that the closure is directed upwards. These receptacles may not be filled beyond 95% of their capacity.

(4) For carriage in tank wagons and jar wagons, see marg. 529.

### 3. *Mixed packing*

522

(1) Substances listed under the same item may be packed together in the same package. The inner packagings shall conform to the requirements prescribed for each substance, and the outer packaging shall be that laid down for the substances of the item in question.

(2) If smaller quantities are not prescribed in the section "Packing of individual substances" and if special conditions are not set out below, substances of this Class, in quantities not exceeding 6 kg in the case of solids or 3 litres in the case of liquids for all of the substances listed under the same item or the same letter, may be placed together in the same package either with substances of another item or another letter of the same Class or with substances or articles belonging to other Classes—as long as mixed packing is also permitted for these—or with other goods, subject to the following special conditions.

The inner packagings must comply with the general and special conditions of packing. In addition, the general regulations of marg. 4 (6) and 8 must be observed.

Mixed packing of an acid substance with a basic substance in the same package is not allowed if both substances are contained in fragile receptacles.

A package must not weigh more than 150 kg, or more than 75 kg if it contains fragile receptacles.

*Special conditions:*

Item No.	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
1 (a)	Oleum	3 litres	12 litres	Must not be packed together with chlorates, permanganates, solutions of hydrogen peroxide, perchlorates, peroxides or hydrazine. The limitation of 18 litres applies to sulphuric, nitric and hydrochloric acids, and mixed nitrating acids, for all of these substances. If the package contains an acid subject to a limitation of 12 litres, this limitation must be applied.
1 (a), (b), (c)	Sulphuric acid other than oleum	3 litres	18 litres	
2 (a)	Nitric acid containing more than 70% pure acid	3 litres	12 litres	Must not be packed together with formic acid, triethanolamine, aniline, xylidine, toluidine, chlorates, permanganates, inflammable liquids with a flash-point below 21° C, solutions of hydrogen peroxide, perchlorates, peroxides, hydrazine, glycerine, glycols. Only inert filling materials must be used.
2 (b) and (c)	Nitric acid containing not more than 70% pure acid	3 litres	18 litres	
3	Mixed nitrating acids	3 litres	18 litres	
4	Perchloric acid	Mixed packing not allowed		
5	Hydrochloric acid	5 litres	18 litres	Must not be packed together with chlorates, permanganates, perchlorates, peroxides (other than solutions of hydrogen peroxide).
6	Solutions of hydrofluoric acid	1 litre	10 litres	
11 (a)	Disulphur dichloride	500 g	500 g	

Item No.	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
11 (a)	Antimony pentachloride Chlorosulphonic acid Sulphuryl chloride Thionyl chloride Titanium tetrachloride Stannic chloride	2.5 kg	5 kg	Must not be packed together with substances of item 36 of Class V or with substances of Class III c; must be protected against penetration of moisture.
12	Antimony trichloride			
14	Bromine —In fragile receptacles —In other receptacles	500 g 1 kg	500 g 3 kg	
15 (a)	Difluorides	5 kg	15 kg	Must not be packed together with substances of Classes I e, II and III c, or with nitric acid or mixed nitrating acids.
21 (b)	Formic acid	5 litres	15 litres	Must not be packed together with chlorates, permanganates, solutions of hydrogen peroxide, nitric acid, mixed nitrating acids.
21 (c)	Acetic acid	5 litres	15 litres	Must not be packed together with chlorates or permanganates.
34	Hydrazine	5.5 kg	5.5 kg	Must not be packed together with sulphuric acid, chlorosulphonic acid, nitric acid, mixed nitrating acids, chlorates, permanganates, sulphur, solutions of hydrogen peroxide, perchlorates and peroxides. Must be kept separate from caustic alkaline substances and strong oxidizing agents.
36	Sodium sulphide containing not more than 70% Na <sub>2</sub> S	2.5 kg	15 kg	Must not be packed together with acid substances.
41 (a)	Solutions of hydrogen peroxide containing more than 35% hydrogen peroxide	Mixed packing not allowed		

Item No.	Description of substance	Maximum quantity		Special regulations
		Per receptacle	Per package	
41 (b)	Solutions of hydrogen peroxide containing more than 15% but not more than 35% hydrogen peroxide —In fragile receptacles —In other receptacles	1 litre 3 litres	3 litres 12 litres	Must not be packed together with sulphuric acid, chlorosulphonic acid, formic acid, nitric acid, mixed nitrating acids, triethanolamine, aniline, xylidine, toluidine, permanganates, inflammable liquids with a flash-point below 21° C, metallic peroxides, hydrazine.
	Solutions of hydrogen peroxide containing more than 6% but not more than 15% hydrogen peroxide	3 litres	12 litres	Only inorganic filling materials must be used.

#### 4. Marking and danger labels on packages (see Appendix IX)

523 Cases containing storage batteries [items 1 (f) and 33] shall be legibly and indelibly marked: "*Storage batteries*". This inscription shall be in an official language of the country of departure and also in French, German, or Italian, unless otherwise provided in the international tariffs or agreements concluded between the railway administrations.

524 (1) Every package containing substances of 1 to 7, 9, 11, 12, 14, 15, 22, 31 to 35 and 41 (a) shall bear a label conforming to model No. 5.

(2) Packages containing fragile receptacles not visible from the outside shall bear labels conforming to model No. 9. If the fragile receptacles contain liquids, the packages shall in addition, except in the case of sealed ampoules, bear labels conforming to model No. 8; these labels shall be affixed high up on two opposite sides of cases in an equivalent manner when other packagings are used.

(3) Every case containing storage batteries [items 1 (f) and 33], and packages weighing not more than 75 kg containing substances of items 1 to 7, 9, 11, 21, 31 to 35 and 37 which, under the provisions of marg. 527 (2), may be loaded in covered wagons, shall, in addition, bear on two opposite sides labels conforming to model No. 8.

(4) In the case of consignments forwarded as a full wagon load, label No. 5, as prescribed under (1), need not be affixed to the packages (see also marg. 532).

#### B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

525 (1) Substances of items 1 to 7, 9, 11, 14, 21, 31 to 35, 37 and 41 (a), other than in consignments which, in conformity with marg. 527 (2), may be loaded in covered wagons, may not be forwarded by *grande vitesse* otherwise than in full wagon loads.

(2) Storage batteries of items 1 (f) and 33 may also be forwarded as express parcels; in this case, a package must not weigh more than 40 kg.

## C. PARTICULARS IN THE CONSIGNMENT NOTE

526

(1) The description of the goods in the consignment note must conform to one of the names printed *in italics* in marg. 501. Where the name of the substance is not indicated in the case of items 11, 12, 13, 15, 22 and 35, the trade name must be used. The description of the goods must be *underlined in red* and followed by *particulars of the Class, the item number (together with the letter, if any), and the initials "RID"* [e.g. *V, item 1 (a), RID*].

(2) In the case of bromine containing 0.005% to 0.2% water, carried in receptacles in conformity with marg. 510 (2), the sender must certify as follows in the consignment note: *Steps have been taken to prevent corrosion of the lining of the receptacles*''.

## D. TRANSPORT EQUIPMENT

1. *Conditions relating to wagons and their loading*a. *For packages*

527

(1) Packages containing substances of items 1 to 9, 11, 13 to 15, 21, 31 to 35, 37 and 41 (a) shall be loaded in open wagons. However, substances of items 13, 15, 21 (a) 1. and 31 in bags and substances of item 36 shall be loaded in covered or sheeted open wagons.

(2) The following, regardless of the number of packages, may nevertheless be loaded in covered or sheeted open wagons:

(a) Packages which, containing the substances listed under (1), consist of strong metal drums, on condition that the latter are so wedged that they cannot roll or overturn;

However, in the case of consignments not carried as a full load, metal drums containing hydrofluoric acid (item 6) or hypochlorite solutions (item 37) must not weigh more than 75 kg;

(b) Packages made up of fragile receptacles, on condition that the receptacles are secured by cushioning material (which latter must comply with the requirements set out in the various marginals concerning the packing of each substance) in protective wooden packagings or, in the case of substances of items 1 to 5 and 32, in iron hampers. However, fragile receptacles containing nitric acid of item 2 (a) or mixed nitrating acids of item 3 (a) shall be secured by cushioning material in wooden cases with complete sides;

(c) Storage batteries [items 1 (f) and 33];

(d) Sodium hydroxide (caustic soda) and potassium hydroxide (caustic potash), in lumps, in flakes or in powdered form (item 31).

(3) Fragile receptacles in the same load must be so wedged as to prevent any movement and any spillage of the contents.

Packages containing substances of item 2 (a) or item 3 (a) must all rest on a solid floor; the use, for wedging, of straw or of any other readily inflammable material is prohibited. Wagons intended for the carriage of these substances must be carefully cleaned and, in particular, cleared of any combustible debris (straw, hay, paper, etc.).

(4) When a load comprises at the same time glass carboys and stoneware jars, these should be grouped according to their type.

(5) As regards the use of electrically-fitted wagons for the carriage of substances of items 2 (a) and 3 (a), see Appendix IV.

b. *For carriage in bulk*

- 528 Bisulphates (item 13) despatched in bulk shall be loaded in wagons lined with lead or with a sufficient thickness of fibreboard coated with paraffin wax or tar. The sheets of open wagons shall be so placed that they cannot touch the load.

c. *For tank wagons*

- 529 (1) Substances of items 1 (a) to (d), 2 to 7, 9, 14, 21 (b), (c) and (e), 23, 32, 34, 35, 37 and 41, the named substances of items 11 (a) and 22, antimony trichloride (item 12) and antimony pentafluoride [item 15 (b)] may be carried in tank wagons. Receptacles shall have all their closures shall be in conformity with the general conditions for packing set out in marg. 502.

(2) Receptacles of tank wagons containing sulphuric acid of item 1 (c) shall be made of a corrosion-resistant metal or be fitted with a suitable lining. They shall not be filled beyond 95% of their capacity.

(3) Receptacles of tank wagons containing liquids of items 2 (a) and 3 (a) shall satisfy the requirements prescribed for metal receptacles.

(4) In the case of hydrofluoric acid (item 6), receptacles of tank wagons shall be made of lead-coated sheet steel; however, in the case of hydrofluoric acid of item 6 (a), steel receptacles which are not lead-coated may also be used. Receptacles shall have all their openings above the level of the liquid; no piping or branch-pipe shall pass through the walls of the receptacles below the level of the liquid.

(5) Receptacles of tank wagons intended for the carriage of stabilised sulphur trioxide of item 9 shall satisfy the following requirements:

- (a) The thickness of the walls of their cylindrical section shall not be less than 10 mm and of their ends not less than 12 mm. They shall be thermally insulated and be equipped with a heating device on the outside. If they are designed to be emptied from the bottom, they shall be provided with a rapid-closing device which shall not protrude on the body's outer surface and shall ensure leakproof closure even in the event of damage to the discharge pipe;
- (b) They shall not be filled beyond 88% of their capacity;
- (c) Before being put into service, they shall undergo a hydraulic-pressure test at a pressure of not less than 4 kg/cm<sup>2</sup> and shall be inspected by an expert approved by the competent authority. The pressure test shall be repeated every three years, when an internal inspection of the receptacle shall also be carried out.

(6) Receptacles of tank wagons intended for the carriage of bromine (item 14) shall satisfy the following requirements:

- (a) They shall be made of fine-grain sheet steel of satisfactory weldability, with completely reliable welds. The thickness of the sheet steel shall be such that the figure expressing that thickness (in millimetres) multiplied by the figure expressing the minimum tensile strength (in kg/mm<sup>2</sup>) of the steel used is at least 520. However, a wall thickness of 10 mm shall be sufficient for receptacles with a capacity not exceeding 5,000 litres;
- (b) They shall be fitted with a leakproof lead lining not less than 6 mm thick, or with a lining made of some other material affording equivalent protection;
- (c) They shall have all their openings above the level of the liquid; no piping or branch-pipe shall pass through the walls of the receptacle below the level of the liquid;



- (d) Their openings shall be hermetically closed and the closure shall be protected by a metal cap firmly secured;
- (e) They shall not be filled beyond 92 per cent of their capacity or beyond 2.86 kg per litre of capacity; however, they shall be filled to not less than 90 per cent of their capacity;
- (f) Before being put into service, each receptacle shall undergo a tightness (leakage) test at a pressure of 2 kg/cm<sup>2</sup>. The condition of the lining shall be checked every year by an approved expert who shall inspect the inside of the receptacle;
- (g) A plate permanently affixed to the receptacle shall bear the following particulars:
  - The name or mark of the manufacturer and the number of the receptacle;
  - The name of the owner;
  - The word "Bromine";
  - The test pressure;
  - The date (month, year) of the pressure test and that of the most recent internal inspection;
  - The capacity in litres and the maximum permissible load in kilograms;
  - The stamp of the expert who carried out the tests and inspections.

(7) Receptacles of tank wagons intended for the carriage of chlorosilanes (item 23) shall conform to the requirements of marg. 311, account being taken, in the matter of the tests to which they must be subjected, of the vapour pressure of chlorosilanes and, in the matter of determining the degree of filling, of their coefficient of cubical expansion.

(8) The openings of tank wagons containing hydrazine (item 34) shall be hermetically closed and their closures protected by metal caps firmly secured.

(9) For the carriage of hypochlorite solutions (item 37), receptacles of tank wagons shall have a suitable inner lining. Tank wagons intended for the carriage of hypochlorite solutions of item 37 (a) shall, in addition, be so designed as to prevent any excess pressure in the receptacle whilst ensuring that the liquid will not splash out.

(10) Aqueous solutions of hydrogen peroxide (item 41) may be carried in jar wagons, or else in tank wagons whose receptacles shall be made of welded aluminium of at least 99.5% purity, or of a special steel not liable to cause the hydrogen peroxide to decompose. Receptacles shall have all their openings above the level of the liquid; no piping or branch-pipe shall traverse the walls of the receptacle below the level of the liquid. However, tank wagons fitted with bottom outlets may be used, on condition that the outlets are securely closed and blanked off during carriage.

Both receptacles and jars shall be fitted with a closure preventing any excess internal pressure, any leakage of the liquid and any entry of foreign matter.

*d. For small containers*

530

(1) With the exception of fragile packages within the meaning of marg. 4 (5) and those containing substances of items 1 to 7, 9, 14, 33 and 41, packages containing substances set out in this Class may be carried in small containers.

(2) The prohibitions on mixed loading laid down in marg. 533 must be applied to the contents of a small container.

(3) Substances of items 1 (a) to (d), 2 to 7, 21 (b), 32, 34, 35, named substances of items 11 (a) and 22, antimony trichloride of item 12 and antimony pentafluoride of item 15 (b) may also be carried in small tank containers.

(4) Bisulphates of item 13 may also be contained without inner packaging in small containers with complete walls, which must conform to the regulations of marg. 528.

2. *Marking and danger labels on wagons and on small containers* (see Appendix IX)

531 Tank wagons intended for the carriage of bromine (item 14) shall have affixed to the wagon a plate bearing the following particulars: the word "Bromine", the tare of the wagon, including the fittings and accessories and the maximum permissible load in kilograms.

532 (1) Wagons in which substances of items 1 to 7, 9, 11, 12, 14, 15, 22, 31 to 35 and 41 (a) are loaded shall bear on both sides labels conforming to model No. 5.

(2) Small containers and small tank containers in which substances of items 1 to 7, 11, 12, 15, 22 and 31 to 35 are loaded shall bear a label conforming to model No. 5.

Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

#### E. PROHIBITIONS ON MIXED LOADING

533 (1) Substances of Class V must not be loaded in the same wagon together:

(a) With substances and articles of Class I a (marg. 21);

(b) With substances of Class VII (marg. 701).

(2) Substances of Class V, except solids of items 13, 15 (a) and 21, must not be loaded in the same wagon together with substances of Class IV a, item 12 (a) and (d) (marg. 401).

(3) Substances of items 1 and 3, mixtures containing sulphuric acid of item 5, sulphur trioxide of item 9 and chlorosulphonic acid of item 11 (a) must not be loaded in the same wagon together with substances of Class III c, item 4 (a), (c) and (d) (marg. 371).

(4) Substances and articles of items 1 to 7 and 9, chlorosulphonic acid [item 11 (a)] and substances of item 21 must not be loaded in the same wagon together with substances of Class IV a, items 32 and 33 (marg. 401).

(5) Substances of items 2 (a) and 3 (a) must not be loaded in the same wagon together:

(a) With articles of Class I b (marg. 61);

(b) With phosgene and cyanogen chloride of Class I d, item 8 (a) (marg. 131);

(c) With substances of items 3, 4 and 11 of marg. 201 or with any other substance of Class II (marg. 201), unless their outer packaging consists of metal receptacles;

(d) With substances of Class III a (marg. 301);

(e) With substances of Class III b (marg. 331);

(f) With substances of Class IV b (marg. 451).

(6) Sodium sulphide of item 36 must not be loaded in the same wagon together with substances and articles of items 1 to 7, 9, 11, 12, 15, 21, 22 and 37.

534 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon [art. 6, para. 10 (d), of CIM].

F. EMPTY PACKAGES

535 (1) Receptacles of item 51 must, when carried in less than full wagon loads, be closed in the same manner and leakproof in the same degree as though they were full.

Empty receptacles of tank wagons which have contained bromine (item 14) must be hermetically closed.

(2) The description of the goods in the consignment note must read: "*Empty receptacle, V, item 51, RID*". This description must be *underlined in red*.

(3) Uncleaned receptacles having contained hydrofluoric acid (item 6) or bromine (item 14) which are handed over for carriage in less than full wagon loads must bear a label conforming to model No. 5 (Appendix IX). They must have no traces of acid or bromine on the outside.

G. OTHER REGULATIONS

536 No regulations.

537-599

CLASS VI. REPUGNANT SUBSTANCES AND SUBSTANCES LIABLE TO CAUSE INFECTION

1. *List of substances*

600 Among the substances and articles covered by the heading of Class VI, only those listed in marg. 601 are to be accepted for carriage, and then only subject to the conditions set out in marg. 601 to 626. These substances and articles to be accepted for carriage under certain conditions are to be considered as substances and articles of RID.

601 1. (a) *Fresh tendons, clippings of fresh skins not limed or salted, trimmings from fresh tendons or from clippings of fresh skins;*

NOTE. Clippings of wet fresh skins, lined or salted, are not subject to the provisions of RID.

(b) *Fresh horns, claws or hoofs not cleansed of bone and soft adhering parts, fresh bones not cleansed of flesh or other soft adhering parts;*

(c) *Undressed pig's bristles and hair.*

2. *Fresh skins, unsalted or salted, from which offensive quantities of blood or brine drip.*

NOTE. Properly salted skins containing only a small quantity of moisture are not subject to the provisions of RID.

3. *Cleaned or dried bones, cleaned or dried horns, claws or hoofs.*

NOTE. Dry bones divested of fat, not giving off any putrid odour, are not subject to the provisions of RID.

4. *Fresh calf rennets, cleansed of all traces of edible matter.*

NOTE. Dried calf rennets not giving off an offensive odour are not subject to the provisions of RID.

5. *Compressed residues arising from the manufacture of skin glue (calcareous residues, residues from the liming of skin clippings, or residues used as fertilizers).*

6. Non-compressed *residues arising from the manufacture of skin glue*.
7. Non-infected *urine* protected against decomposition.
8. *Anatomical pieces, entrails and glands*,
  - (a) *Non-infected*,
  - (b) *Infected*.
9. *Manure*.
10. *Excrement*.
11. Other *animal substances*, repugnant or liable to cause infection, not already specifically mentioned in items 1 to 10.
12. *Empty packagings and empty bags* which have contained substances of items 1 to 8, 10 and 11, and *sheets* which have been used to cover substances of Class VI.

NOTE. If uncleaned, these packagings, bags and sheets are not to be accepted for carriage.

## 2. *Conditions of carriage*

(The regulations relating to empty packagings and to sheets are to be found under F.)

### A. PACKAGES

#### 1. *General conditions for packing*

602 (1) Packagings shall be so closed and leakproof as to prevent any loss of the contents. For the special regulation relating to metal receptacles containing substances of items 1, 8 and 11, see marg. 617 (2) (a).

(2) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. In particular, where substances are in the liquid state or are liable to ferment, receptacles and their closures must, unless the section headed "Packing of individual substances" provides otherwise, be able to withstand any pressure which, the presence of air also being taken into account, may arise inside the receptacles in normal carriage. For this purpose a free space must be left, account being taken of the difference between the temperature of the substances at the time of filling and the highest mean temperature which they are likely to reach during carriage.

(3) No trace of the contents must adhere to the outside of packages.

#### 2. *Packing of individual substances*

603 (1) Substances of item 1 shall be packed:

(a) If forwarded in less than full wagon loads:

1. In metal receptacles fitted with a safety closure capable of yielding to internal pressure, or in casks, small vats or cases; or
2. In the case of substances of item 1 (c) in the dry state, also in bags, on condition that the bad odour can be removed by disinfection. In the case of substances not in the dry state, packing in bags is allowed only from 1 November to 15 April;

(b) If forwarded in full wagon loads:

1. In the packagings specified in (a) 1. above; or

2. On condition that the bad odour can be removed by disinfection, in bags impregnated with suitable disinfectants.
  - (2) For carriage in bulk, see marg. 618.
- 604 (1) Substances of item 2 shall be packed:
  - (a) If forwarded in less than full wagon loads:
    1. In casks, small vats or cases; or
    2. During the months from November to February inclusive, in bags impregnated with suitable disinfectants, on condition that the bad odour can be removed by disinfection;
  - (b) If forwarded in full wagon loads:
    1. In the packagings specified in (a) 1. above; or
    2. On condition that the bad odour can be removed by disinfection, in bags impregnated with suitable disinfectants.
  - (2) For carriage in bulk, see marg. 618.
- 605 (1) Substances of item 3 shall be packed in casks, small vats, cases, metal receptacles or bags.
  - (2) For carriage in bulk, see marg. 618.
- 606 Substances of item 4 shall be packed:
  - (a) If forwarded in less than full wagon loads: in casks, small vats, cases, metal receptacles or bags;
  - (b) If forwarded in full wagon loads: in any suitable packagings.
- 607 (1) Substances of items 5 and 6 shall be packed in casks, small vats, cases or metal receptacles.
  - (2) For the carriage in bulk of substances of item 5, see marg. 618.
- 608 Substances of item 7 shall be packed in hermetically closed receptacles made of galvanised sheet steel.
- 609 (1) Substances of item 8, if forwarded either in less than full wagon loads by *petite vitesse* or in full wagon loads, shall be packed in metal receptacles fitted with a safety closure capable of yielding to internal pressure, or in casks or small vats; substances of item 8 (a) may also be packed in cases.
  - (2) If forwarded in less than full wagon loads by *grande vitesse*:
    - (a) Substances of item 8 (a) shall be packed in receptacles made of glass, porcelain, stoneware, metal or a suitable plastics material. These receptacles shall be placed, either singly or in groups, in a strong wooden case, with absorbent cushioning material if the receptacles are fragile. If the substances to be carried are immersed in a preserving fluid, the absorbent material shall be sufficient in quantity to absorb all the fluid. The preserving fluid must not be inflammable. Packages weighing more than 30 kg shall be fitted with means of handling;
    - (b) Substances of item 8 (b) shall be packed in suitable receptacles placed with cushioning material in a strong wooden case having a metal lining rendered leakproof, e.g. by soldering. Packages weighing more than 30 kg shall be fitted with means of handling.
- 610 Substances of item 9 shall be forwarded only in bulk.
- 611 Substances of item 10 shall be packed in receptacles made of sheet metal.

612 Substances of item 11 shall be packed in metal receptacles fitted with a safety closure capable of yielding to internal pressure, or in casks, small vats or cases.

3. *Mixed packing*

613 Substances listed under an item of marg. 601 may be included in the same package only with substances listed under the same item, and then only on condition that the packagings prescribed in sections A.1 and 2 above are used.

614 4. *Marking and danger labels on packages* (see Appendix IX)

Packages containing fragile receptacles not visible from the outside shall bear a label conforming to model No. 9. If the fragile receptacles contain liquids, the packages shall in addition, except in the case of sealed ampoules, bear labels conforming to model No. 8; these labels shall be affixed high up on two opposite sides of cases or in an equivalent manner when other packagings are used.

B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING

615 (1) Substances of items 1 to 6 may not be forwarded by *grande vitesse* otherwise than in full wagon loads.

(2) Substances of items 9 and 10 may not be forwarded otherwise than by *petite vitesse* and in full wagon loads.

(3) Substances of item 7, and substances of item 8 when packed in conformity with marg. 609 (2), may nevertheless be forwarded as express parcels on condition that the weight of a package does not exceed 30 kg in the case of substances of item 7 and 40 kg in the case of substances of item 8.

C. PARTICULARS IN THE CONSIGNMENT NOTE

616 The description of the goods in the consignment note must conform to one of the names printed in *italics* in marg. 601. Where the name of the substance is not indicated, the trade name must be used. The description of the goods must be *underlined in red* and followed by *particulars of the Class, the item number (together with the letter if any), and the initials "RID"* [e.g. VI, item 1 (a), RID].

D. TRANSPORT EQUIPMENT

1. *Conditions relating to wagons and their loading*

a. *For packages*

617 (1) Packages containing substances of Class VI shall be loaded in open wagons.

(2) The following may be loaded in covered wagons:

(a) Substances of items 1, 8 and 11, if they are contained in metal receptacles fitted with a safety closure capable of yielding to internal pressure;

(b) Substances of items 3, 4 and 7.

b. *For carriage in bulk*

618 (1) The following may be loaded in bulk in open wagons:

(a) Substances of items 1 (a) and (c) and 2, but only from November to February inclusive, substances of item 1 (b) throughout the year, on condition that they have been sprayed with suitable disinfectants. If, however, the bad odour cannot be removed by disinfectant these substances shall be packed in casks or small vats;

(b) Substances of item 3;

- (c) Substances of item 5 if they are sprayed with lime-wash so that no putrid odour is discernible. If the bad odour cannot be removed, they shall be packed in casks, small vats or cases;
- (d) Substances of item 9.
  - (2) The following shall be covered with:
    - (a) A sheet impregnated with suitable disinfectants and itself covered with a second sheet: substances of items 1 (a) and (c) and 2;
    - (b) A sheet or tarred or bituminized fibreboard (and sprayed with suitable disinfectants): fresh horns, claws, hoofs or bones [item 1 (b)];
    - (c) A sheet: substances of item 3, unless they are sprayed with suitable disinfectants to prevent any bad odour; and
    - (d) A sheet: substances of item 9.
  - (3) Substances of items 1 (a) and (c) and 2 may also be loaded in specially fitted covered wagons equipped with means of ventilation.
  - (4) Wagons which have carried substances of Class VI must, after unloading, be thoroughly washed out and treated with suitable disinfectants.

c. *For small containers*

- 619 (1) Packages containing substances set out in this Class may also be carried in small containers.
- (2) The prohibitions on mixed loading laid down in marg. 621 must be applied to the contents of a small container.
- (3) Substances whose carriage in bulk is permitted, with the exception of those of item 9, may be enclosed in small containers with complete walls; these, after unloading, must be thoroughly washed out and treated with suitable disinfectants.

2. *Marking and danger labels on wagons and on small containers* (see Appendix IX)

- 620 Small containers enclosing packages bearing a label conforming to model No. 9 shall also bear this label.

E. PROHIBITIONS ON MIXED LOADING

- 621 With the exception of substances of item 7 forwarded as express parcels and of item 8 forwarded as express parcels and packed in conformity with marg. 609 (2) (a) or (b), substances of Class VI must not be loaded in the same wagon together with foodstuffs or other articles for consumption.

- 622 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon [art. 6, para. 10 (d), of CIM].

F. EMPTY PACKAGINGS

- 623 (1) Articles of item 12 shall be cleaned and treated with suitable disinfectants.
- (2) Articles of item 12 may not be carried otherwise than by *petite vitesse* and shall be loaded in open wagons; they must not be loaded in the same wagon together with foodstuffs or other articles for consumption.
- (3) The description in the consignment note must read: "*Empty packaging (or empty bag, or sheet), VI, item 12, RID*". This description must be *underlined in red*.

- 624 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon [art. 6, para. 10 (d) of CIM].

## G. OTHER REGULATIONS

625 (1) The railway may restrict the carriage of substances and articles of Class VI to certain trains and make special arrangements regarding the time and duration of loading and unloading, and of carting on departure or arrival.

(2) If a bad odour is discernible, the railway may have the substances treated at any time with suitable disinfectants to get rid of the odour.

626 With the exception of substances of item 7 and of anatomical pieces, entrails and glands of item 8, packed in conformity with marg. 609 (2), substances of Class VI must be kept apart in goods depots from foodstuffs or other articles for consumption.

627-699

## CLASS VII. ORGANIC PEROXIDES

1. *List of substances*

700 Among the substances and articles covered by the heading of Class VII, only those listed in marg. 701 are to be accepted for carriage and then only subject to the conditions set out in marg. 701 to 721. These substances and articles to be accepted for carriage under certain conditions are to be considered as substances and articles of RID.

NOTE. Organic peroxides which may explode on contact with a flame, or which are more sensitive to shock or to friction than dinitrobenzene, are not to be accepted for carriage unless they are specifically listed in Class I a (see marg. 21, item 10, and Appendix I, marg. 1112).

## 701 GROUP A

1. *Ditertiary butyl peroxide.*
2. *Tertiary butyl hydroperoxide* with not less than 20% ditertiary butyl peroxide and not less than 20% phlegmatiser.

NOTE. Tertiary butyl hydroperoxide with 20% ditertiary butyl peroxide but without phlegmatiser is listed under item 31.

3. *Tertiary butyl peracetate* with not less than 30% phlegmatiser.
4. *Tertiary butyl perbenzoate.*
5. *Tertiary butyl permaleate* with not less than 50% phlegmatiser.
6. *Ditertiary butyl diperphthalate* with not less than 50% phlegmatiser.
7. *2,2-bis (tertiary butyl peroxy) butane* with not less than 50% phlegmatiser.
8. *Benzoyl peroxide:*
  - (a) With not less than 10% water;
  - (b) With not less than 30% phlegmatiser.

NOTE. 1. Benzoyl peroxide in the dry state or with less than 10% water or less than 30% phlegmatiser is a substance of Class I a [see marg. 21, item 10 (a)].

2. Benzoyl peroxide containing not less than 70% dry and inert solid substances is not subject to the provisions of RID.

9. *Cyclohexanone peroxides* [1 hydroxy-hydroperoxydicyclohexylperoxide and bis(1-hydroxycyclohexyl) peroxide and mixtures of these two compounds]:
  - (a) With not less than 5% water;
  - (b) With not less than 30% phlegmatiser.



NOTE. 1. Cyclohexanone peroxides and their mixtures in the dry state or with less than 5% water or less than 30% phlegmatiser are substances of Class I a [see marg. 21, item 10 (b)].

2. Cyclohexanone peroxides and their mixtures containing not less than 70% dry and inert solid substances are not subject to the provisions of RID.

10. *α,α-Dimethylbenzyl hydroperoxide (cumene hydroperoxide, cumyl hydroperoxide)* with a peroxide content not exceeding 95%.
11. *Dilauroyl peroxide*.
12. *1,2,3,4-Tetrahydro-1-naphthyl hydroperoxide (tetralin hydroperoxide)*.
13. *2,4-Dichlorobenzoyl peroxide*:
  - (a) With not less than 10% water;
  - (b) With not less than 30% phlegmatiser.
14. *p-Menthanyl hydroperoxide (p-menthane hydroperoxide)* with a peroxide content not exceeding 95% (remainder: alcohols and ketones).
15. *2,6,6-Trimethylnorpinanyl hydroperoxide (pinanyl hydroperoxide, pinane hydroperoxide)* with a peroxide content not exceeding 95% (remainder: alcohols and ketones).
16. *Di-(α, α-dimethylbenzyl) peroxide (dicumyl peroxide)* with a peroxide content not exceeding 95%.

NOTE. Di-(α, α-dimethylbenzyl) peroxide containing 60% or more dry and inert solids is not subject to the provisions of RID.

17. *Parachlorobenzoyl peroxide*:
  - (a) With not less than 10% water;
  - (b) With not less than 30% phlegmatiser.

NOTE. 1. Parachlorobenzoyl peroxide in the dry state or with less than 10% water or less than 30% phlegmatiser is a substance of Class I a [see marg. 21, item 10 (c)].

2. Parachlorobenzoyl peroxide with a content of 70% or more dry and inert solid substances is not subject to the provisions of RID.

18. *Di-isopropylbenzene hydroperoxide (isopropylcumyl hydroperoxide)* with 45% of a mixture of alcohol and ketone.
19. *4-Methylpentan-2-one peroxide (isobutyl methyl ketone peroxide)* with not less than 40% phlegmatiser.
20. *Tertiary butyl (α, α-dimethylbenzyl) peroxide (tertiary butyl cumyl peroxide)* with not more than 95% peroxide.
21. *Diacetyl peroxide* with not less than 75% phlegmatiser.
22. *Acetyl benzoyl peroxide* with not less than 60% phlegmatiser.

NOTE re items 1 to 22. Substances which are inert to organic peroxides and have a flash-point not lower than 100° C and a boiling-point not lower than 150° C are considered as phlegmatising substances. Substance of Group A may also be diluted with solvents which are inert to these substances.

#### GROUP B

30. *Butanone peroxide (ethyl methyl ketone peroxide)*:
  - (a) With not less than 50% phlegmatiser;
  - (b) In solutions containing not more than 12% of this peroxide in solvents which are inert to it.

31. *Tertiary butyl hydroperoxide:*

- (a) With not less than 20% tertiary butyl peroxide, without phlegmatiser;
- (b) In solutions containing not more than 12% of this hydroperoxide in solvents which are inert to it.

NOTE re items 30 and 31. Substances which are inert to organic peroxides and which have a flash-point not lower than 100° C and a boiling-point not lower than 150° C are considered as phlegmatising substances.

## GROUP C

35. *Peracetic acid* containing not more than 40% peracetic acid and not less than 45% acetic acid and not less than 10% water.

NOTE re Groups A, B and C. Mixtures of products listed in Groups A, B and C are to be accepted for carriage subject to the conditions laid down for Group C if they contain peracetic acid, and in other cases, subject to the conditions of carriage laid down for Group B.

## GROUP D

40. Samples of phlegmatized *organic peroxides* not listed in Groups A, B or C, or of their solutions, are to be accepted in quantities not exceeding 1 kg per package, on condition that their stability in storage is at least equal to that of the substances listed in Groups A and B.

## GROUP E

50. *Empty packagings*, uncleaned, including receptacles of tank wagons, which have contained substances of Class VII.2. *Conditions of carriage*

(The regulations relating to empty receptacles are to be found under F.)

## A. PACKAGES

1. *General conditions for packing*

702 (1) The materials of which the packagings and their closures are made must not be liable to attack by the contents or form harmful or dangerous compounds therewith.

(2) Packagings, including their closures, must be sufficiently rigid and strong in all their parts to prevent any loosening during carriage and to meet the normal requirements of carriage. Inner packagings shall be firmly secured in outer packagings. Unless otherwise specified in the section "Packing of individual substances", inner packagings may be enclosed in outer packagings, either singly or in groups.

(3) Cushioning material must not be readily inflammable; it shall, in addition, be suited to the nature of the contents and must not cause the peroxides to decompose.

2. *Packing of individual substances*a. *Packing of substances of Group A*

703 Receptacles shall be so closed and leakproof as to prevent any loss of the contents.

704 (1) Substances of items 1 to 7, 8 (b), 9 (b), 10 to 12, 13 (b), 14 to 16, 17 (b) and 18 to 22 and their solutions shall be packed:

- (a) In hot-dipped tinned receptacles or in receptacles made of aluminium not less than 99.5% pure; or

- (b) In receptacles made of a suitable plastics material, which shall be placed in protective packagings; or
- (c) Not more than 2 litres per bottle, in tightly closing glass bottles, which shall be secured by cushioning material, in a protective packaging so as to be protected against breakage.
- (2) Substances of items 1 to 3, 5 to 7, 8 (b), 10 to 12, 13 (b), 16, 18 and 20 may also be packed in hot-dipped galvanised receptacles.
- (3) Substances of items 8 (a), 9 (a), 13 (a) and 17 (a) shall be contained, not more than 5 kg per packaging, in water-tight packagings placed in a wooden case.
- (4) Pasty and solid peroxides may also be packed in bags, made of a suitable plastics material, placed in suitable protective packagings. The thickness of the packaging material shall be sufficient to prevent any loss of the contents from the bags in normal carriage. Solid peroxides may be packed, not more than 1 kg per receptacle, in paraffin-waxed fibreboard receptacles placed in a wooden case; however, in the case of cyclohexanone peroxides of item 9 (a), the contents of the receptacles shall be limited to 500 g.
- (5) Substances of items 10 and 14 to 18 may also be packed in receptacles made of sheet steel.
- (6) With the exception of bags made of a suitable plastics material, receptacles containing liquid or pasty organic peroxides must not be filled beyond 93% of their capacity.
- (7) A package must not weigh more than 50 kg. Packages weighing more than 15 kg shall be fitted with means of handling.
- (8) For the carriage of substances of items 10, 14 and 15 in tank wagons see marg. 715.

b. *Packing of substances of Group B*

705

(1) Receptacles filled with substances of items 30 (a) and 31 (a) shall be fitted with a venting device allowing compensation between the internal pressure and the atmospheric pressure and in all circumstances—even in the event of expansion of the liquid through heating—preventing the liquid from splashing out and impurities from entering the receptacle. Only receptacles so closed and leak-proof as to prevent any loss of the contents shall be accepted for substances of items 30 (b) and 31 (b).

(2) Packages shall be fitted with a base which keeps them securely upright without danger of falling.

706

(1) Substances of items 30 (a) and 31 (a) shall be packed:

(a) In hot-dipped tinned or galvanised receptacles or in receptacles made of aluminium not less than 99.5% pure; or

(b) In receptacles, made of a suitable plastics material, placed in protective packagings. The strength of these receptacles shall be sufficient to prevent any loss of the contents in normal carriage; or

(c) Not more than 2 litres per bottle, in glass bottles, which shall be secured by cushioning material in a protective packaging, so as to be protected against breakage.

(2) Receptacles containing liquid or pasty organic peroxides must not be filled beyond 90% of their capacity.

(3) A package must not weigh more than 40 kg; packages weighing more than 15 kg shall be fitted with means of handling.

(4) Substances of items 30 (b) and 31 (b) may be forwarded only in quantities not exceeding 5 kg in receptacles as specified in (1) but not equipped with a venting device (in glass bottles, only in quantities not exceeding 1.5 litres). Receptacles shall not be filled beyond 75% of their capacity.

*c. Packing of substances of Group C*

707 (1) Substances of item 35 and mixtures containing peracetic acid shall be packed, not more than 25 kg per receptacle, in glass receptacles with strong walls or in receptacles made of a suitable plastics material, fitted with a special closure made of a suitable plastics material, capable of being sealed, in communication with the atmosphere through an opening situated above the level of the liquid and in all circumstances—even in the event of expansion of the liquid through heating—preventing the liquid from splashing out and impurities from entering the receptacle.

(2) Glass receptacles shall be firmly secured, by clean mica powder or glass wool used as cushioning material, in protective packagings made of sheet steel or of aluminium, capable of being closed, and fitted with means of handling and with a base which keeps them securely upright; the receptacles shall be secured even if the walls of the protective packagings are not complete. Receptacles made of a suitable plastics material must be placed in protective sheet-steel packagings which are close-fitting and capable of being closed.

*d. Packing of substances of Group D*

708 Substances of Group D shall be packed in quantities not exceeding 1 kg per package, in hot-dipped tinned receptacles, or in receptacles made of aluminium not less than 99.5% pure, or in bottles made of a suitable plastics material injection-moulded or blown and having a sufficient wall thickness, or in glass bottles placed in protective packagings made of sheet steel, aluminium or wood. The glass bottles shall be firmly secured, in the protective packagings by clean mica powder or glass wool used as cushioning material. Solid compounds may also be packed in bags, made of a suitable plastics material of sufficient thickness, likewise placed in protective packagings made of sheet steel, aluminium or wood. If the peroxides give off gases at a temperature lower than 40° C, the receptacles must satisfy the conditions of marg. 705.

*e. Packing of substances in small quantities*

709 Substances of items 1 to 22, 30 and 31, forwarded in small quantities, may also be packed as follows:

(a) Liquid substances

Not more than 1 kg per package, in bottles made of aluminium, a suitable plastics material or glass, with stoppers, made of a suitable plastics material or with yoke or screw closures having, in either case, an elastic gasket. The bottles shall be secured, by clean mica powder or glass wool used as cushioning material, in fibreboard or wooden boxes. There must be sufficient quantity of such material to absorb all the liquid. The bottles shall not be filled beyond 75% of their capacity.

(b) Pasty or powdered substances

Not more than 1 kg per package, in aluminium boxes or in fibreboard or wooden boxes (the two latter being lined with aluminium or a suitable plastics material), with a strong closure. A free space of 10% shall be left in the packagings.

3. *Mixed packing*
- 710 Substances of Class VII must not be included in the same package either with other substances and articles of RID or with other goods. Substances of Group C must not be included in the same package with substances of Groups A and B.
4. *Marking and danger labels on packages* (see Appendix IX)
- 711 (1) Every package containing substances of Class VII shall bear a label conforming to model No. 2.
- (2) Packages containing fragile receptacles not visible from the outside shall bear a label conforming to model No. 9. If the fragile receptacles contain liquids, the packages shall in addition, except in the case of sealed ampoules, bear labels conforming to model No. 8; packages containing substances of items 30, 31, 35 and 40 shall also bear labels conforming to model No. 8; these labels shall be affixed high up on two opposite sides of cases or in an equivalent manner when other packagings are used.
- B. METHOD OF DESPATCH AND RESTRICTIONS ON FORWARDING
- 712 Substances of Class VII may not be carried otherwise than by *petite vitesse*.
- C. PARTICULARS IN THE CONSIGNMENT NOTE
- 713 The description of the goods in the consignment note must conform to one of the names printed *in italics* in marg. 701; it must be *underlined in red* and followed by *particulars of the Class, the item number (together with the letter, if any), and the initials "RID"* [e.g. VII, item 8 (a), RID].
- D. TRANSPORT EQUIPMENT
1. *Conditions relating to wagons and their loading*
- a. *For packages*
- 714 (1) Substances of items 1 to 22, 30 and 31 shall be loaded in covered wagons, and substances of item 35 in open wagons.
- (2) Packages containing liquid peroxides shall be kept upright and be so secured and fixed that they cannot overturn or fall. They shall be protected against any damage which might be caused by other packages.
- (3) Wagons shall be thoroughly cleaned before loading.
- b. *For tank wagons*
- 715 Substances of items 10, 14 and 15 may be carried in tank wagons whose receptacles and closures shall satisfy the following requirements:
- (a) The receptacles must be made of aluminium not less than 99.5% pure and have a capacity of 10 to 15m<sup>3</sup>;
- (b) They must be equipped with a venting device fitted with a flame-trap and closed by a safety valve opening automatically under an internal manometric pressure of 1.8 to 2.2 kg/cm<sup>2</sup>. The constituent materials of closures likely to come into contact with the liquid or its vapour must not exercise a catalytic effect (spring-loaded safety valve made of aluminium-silicon alloy or of V2A stainless steel or of a material of equivalent quality);
- (c) Before being put into service, the receptacles must be tested under the supervision of an expert approved by the competent authority; the internal manometric pressure for the hydraulic-pressure test must be 3 kg/cm<sup>2</sup>. The tests shall be repeated at least once every six years and shall be accompanied by an internal inspection;

- (d) The degree of filling must not exceed 75% of capacity;
- (e) The receptacles shall be equipped with thermal insulation in conformity with marg. 159 (4). The covering and the uncovered part of the receptacle paint, which shall be given a coat of white shall be cleaned before each journey and be renewed if it turns yellow or deteriorates;
- (f) The receptacles must be free from impurities at the time of filling.
- c. *For small containers*
- 716 (1) With the exception of fragile packages as specified in marg. 4 (5), packages containing substances set out in this Class may be carried in small containers.
- (2) The prohibitions on mixed loading laid down in marg. 718 must be applied to the contents of a small container.
2. *Marking and danger labels on wagons and on small containers* (see Appendix IX)
- 717 (1) Wagons in which packages containing organic peroxides are loaded shall bear on both sides labels conforming to model No. 2.
- (2) Small containers in which substances of this Class are loaded shall bear a label conforming to model No. 2.
- Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.
- E. PROHIBITIONS ON MIXED LOADING
- 718 Substances of Class VII must not be loaded in the same wagon together:
- (a) With substances and articles of Class I a (marg. 21);
- (b) With articles of Class I b (marg. 61);
- (c) With substances of Class I e (marg. 181);
- (d) With substances of Class II (marg. 201);
- (e) With substances of Class III a (marg. 301);
- (f) With substances of Class III b (marg. 331);
- (g) With substances of Class IV b (marg. 451);
- (h) With substances of Class V (marg. 501).
- 719 Separate consignment notes must be made out for consignments which may not be loaded together in the same wagon [art. 6, para. 10 (d), of CIM].
- F. EMPTY PACKAGINGS
- 720 (1) Receptacles of item 50 must be closed in the same way and leakproof in the same degree as though they were full.
- (2) The description in the consignment note must read: “*Empty receptacle, VII, item 50, RID*”. This description must be *underlined in red*.
- G. OTHER REGULATIONS
- 721 No regulations.
- 722-1099

## PART III. APPENDICES

## APPENDIX I

A. STABILITY AND SAFETY CONDITIONS RELATING TO EXPLOSIVE SUBSTANCES,  
INFLAMMABLE SOLIDS AND ORGANIC PEROXIDES

- 1100** The conditions of stability set out below are the standard minima defining the stability required of substances to be accepted for carriage. These substances may be handed over for carriage, only if they fully conform to the following regulations.
- 1101** *Re marg. 21, item 1, marg. 101, item 4 and marg. 331, item 7 (a):*  
Nitrocellulose heated for half an hour at 132° C must not give off visible yellowish-brown nitrous fumes. The ignition temperature must be above 180° C. Pyroxylin thread must satisfy the same conditions of stability as nitrocellulose. See marg. 1150, 1151 (a) and 1153.
- 1102** *Re marg. 21, items 3, 4 and 5 and marg. 331, item 7 (b) and (c):*  
1. Nitrocellulose powders not containing nitroglycerine; plasticised nitrocellulose: 3 g of powder or of plasticised nitrocellulose, heated for one hour at 132° C must not give off visible yellowish-brown nitrous fumes. The ignition temperature must be above 170° C.  
2. Nitrocellulose powders containing nitroglycerine: 1 g of powder, heated for one hour at 110° C must not give off visible yellowish-brown nitrous fumes. The ignition temperature must be above 160° C.  
With regard to 1. and 2., see marg. 1150, 1151 (b) and 1153.
- 1103** *Re marg. 21, items 6, 7, 8 (a) and (b) and 9 (a), (b) and (c):*  
1. Trinitrotoluene (trotyl), mixtures termed liquid trinitrotoluene and trinitroamisol (item 6), hexyl (hexanitrodiphenylamine) and picric acid [item 7 (a)], pentolites (mixtures of pentaerythritol tetranitrate and trinitrotoluene) and hexolites (mixtures of trimethylene-trinitramine and trinitrotoluene) [item 7 (b)], phlegmatised penthrite and phlegmatised hexogen [item 7 (c)], trinitroresorcinol [item 8 (a)], tetryl (trinitrophenylmethylnitramine) [item 8 (b)], penthrite (pentaerythritol tetranitrate) and hexogen (trimethylene-trinitramine) [item 9 (a)], pentolites (mixtures of penthrite and trinitrotoluene) and hexolites (mixtures of hexogen and trinitrotoluene) [item 9 (b)] and mixtures of penthrite or hexogen with wax, paraffin wax or substances similar to wax or paraffin wax [item 9 (c)], heated for 3 hours at a temperature of 90° C, must not give off visible yellowish-brown nitrous fumes. See marg. 1150 and 1152 (a).  
2. Organic nitro-compounds mentioned in item 8, other than trinitroresorcinol and tetryl (trinitrophenylmethylnitramine), heated for 48 hours at a temperature of 75° C must not give off visible yellowish-brown nitrous fumes. See marg. 1150 and 1152 (b).  
3. Organic nitro-compounds mentioned in item 8 must not be more sensitive to ignition, impact or friction than:  
Trinitroresorcinol, if they are soluble in water,  
Tetryl (trinitrophenylmethylnitramine), if they are insoluble in water.  
See marg. 1150, 1152, 1154, 1155 and 1156.
- 1104** *Re marg. 21, item 11 (a) and (b):*  
1. Black powder [item 11 (a)] must not be more sensitive to ignition, impact or friction than the finest sporting powder having the following composi-

tion: 75% potassium nitrate, 10% sulphur and 15% black alder charcoal. See marg. 1150, 1154, 1155 and 1156.

2. Slow mining powders similar to black powder [item 11 (b)] must not be more sensitive to ignition, impact or friction than the standard explosive having the following composition: 75% potassium nitrate, 10% sulphur and 15% lignite. See marg. 1150, 1154, 1155 and 1156.

**1105** *Re marg. 21, item 12*

Nitrate explosives, in powder form [item 12 (a)], and explosives not containing inorganic nitrates, in powder form [item 12 (b)], must be capable of being stored for 48 hours at 75° C without giving off visible yellowish-brown nitrous fumes. Before and after storage they must not be more sensitive to ignition, impact or friction than the standard explosive having the following composition: 80% ammonium nitrate, 12% trinitrotoluene, 6% nitroglycerine and 2% wood flour. See marg. 1150, 1152 (b), 1154 (a) and (b), 1155 and 1156.

A sample of the standard explosive referred to above is held at the disposal of the Contracting States by Laboratoire des substances explosives, Sevran (Seine-et-Oise), France.

**1106** *Re marg. 21, item 13:*

Chlorate and perchlorate explosives must not contain any ammonium salt. They must not be more sensitive to ignition, impact or friction than a chlorate explosive having the following composition: 80% potassium chlorate, 10% dinitrotoluene, 5% trinitrotoluene, 4% castor oil and 1% wood flour. See marg. 1150, 1154, 1155 and 1156.

**1107** *Re marg. 21, item 14 (a) and (b):*

Explosives of item 14 (a) and (b) must not be more sensitive to ignition, impact or friction than blasting gelatine containing 93% nitroglycerine or guhr dynamite containing not more than 75% nitroglycerine. They must satisfy the exudation test of marg. 1158. See marg. 1150, 1154 (b), 1155 and 1156.

*Re marg. 21, item 14 (c):*

Explosives of item 14 (c) must be capable of being stored for 48 hours at 75° C without giving off visible yellowish-brown nitrous fumes. Before and after storage, they must not be more sensitive to ignition, impact or friction than the standard explosive having the following composition: 37.7% nitroglycol or nitroglycerine or a mixture of the two, 1.8% guncotton, 4.0% trinitrotoluene, 52.5% ammonium nitrate and 4.0% wood flour. See marg. 1150, 1152 (b), 1154 (a), (b), (c) and (d), 1155 and 1156.

**1108** *Re marg. 61, item (b):*

The explosive substances must not be more sensitive to ignition, impact or friction than tetryl. See marg. 1150, 1154, 1155 and 1156.

**1109** *Re marg. 61, item 1 (c):*

The explosive substance must not be more sensitive to ignition, impact or friction than penthrite. See marg. 1150, 1154, 1155 and 1156.

**1110** *Re marg. 61, item 5 (d):*

The transmission charge must not be more sensitive to ignition, impact or friction than tetryl. See marg. 1150, 1154, 1155 and 1156.

**1111** *Re marg. 100 (2) (d):*

The explosive charge, after having been stored for four weeks at 50° C, must show no signs of deterioration due to insufficient stability. See marg. 1150 and 1157.



1112 *Re marg. 701, items 1 to 40:*

The substances shall be subjected to the tests described in marg. 1154, 1155 and 1156.

1113-  
1149

#### B. RULES FOR TESTS

1150 (1) The test procedures set out below are to be applied when differences of opinion arise as to the acceptance of substances for carriage by rail.

(2) If other methods or test procedures are used to verify the conditions of stability set out in part A of this appendix, those methods must lead to the same findings as could be reached by the methods specified below.

(3) In carrying out the stability tests by heating described below, the temperature of the oven containing the sample under test must not deviate by more than 2° C from the prescribed temperature; the prescribed duration of a 30-minute or 60-minute test must be observed to within two minutes, that of a 48-hour test to within one hour, and that of a 4-week test to within 24 hours.

The oven must be such that the required temperature is restored not more than five minutes after insertion of the sample.

(4) Before undergoing the tests prescribed in marg. 1151, 1152, 1153, 1154, 1155 and 1156, the samples must be dried for not less than 15 hours at the ambient temperature in a vacuum desiccator containing fused and granulated calcium chloride; the substance shall be spread in a thin layer; for this purpose, substances which are neither in powder form nor fibrous shall be ground or grated or cut into small pieces. The pressure in the desiccator must be brought below 50 mm of mercury.

(5) (a) Before being dried as prescribed in (4) above, substances of marg. 21, item 1 (except those containing paraffin wax or a similar substance), items 2, 9 (a) and (b), and those of marg. 331, item 7 (b), shall undergo preliminary drying in a well-ventilated drying oven with its temperature set at 70° C, until the loss of weight per quarter-hour is not less than 0.3% of the original weight.

(b) For substances of marg. 21, item 1 (when they contain paraffin wax or a similar substance), items 7 (c) and 9 (c), the preliminary drying must be carried out as in (a) above, except that the temperature of the oven shall be set at between 40° and 45° C.

(6) Nitrocellulose of marg. 331, item 7 (a), shall first undergo a preliminary drying as prescribed in (5) (a) above; drying shall be completed by keeping the nitrocellulose for at least 15 hours over concentrated sulphuric acid in a desiccator.

#### TEST OF CHEMICAL STABILITY UNDER HEAT

1151 *Re marg. 1101 and 1102:*

(a) *Test of substances listed in marg. 1101*

(1) Into each of two glass test tubes having the following dimensions:

Length .....	350 mm
Internal diameter .....	16 mm
Thickness of the walls .....	1.5 mm

is put 1 g of substance dried over calcium chloride (the drying must be carried out, if necessary, by reducing the substance to fragments weighing not more

than 0.05 g each). Both test tubes, completely covered with loose-fitting closures, are then so placed in an oven that at least four fifths of their length can be seen, and are kept at a constant temperature of 132° C for 30 minutes. It is observed whether nitrous gases in the form of yellowish-brown fumes clearly visible against a white background are given off during this time.

(2) The substance is to be considered stable in the absence of such fumes.

(b) *Test of powders listed in marg. 1102*

(1) Nitrocellulose powders not containing nitroglycerine, whether gelatinised or not, and plasticised nitrocellulose: 3 g of powder are put into glass test tubes similar to those referred to in (a), which are then placed in an oven kept at a constant temperature of 132° C.

(2) Nitrocellulose powders containing nitroglycerine: 1 g of powder is put into glass test tubes similar to those referred to in (a), which are then placed in an oven kept at a constant temperature of 110° C.

(3) The test tubes containing the powders referred to in (1) and (2) are kept in the oven for one hour. During this time no nitrous gases must be visible. Observation and appraisal as in (a).

**1152** *Re marg. 1103 and 1105:*

(a) *Test of substances listed in marg. 1103, 1.*

(1) Two samples of explosive each weighing 10 g are put into cylindrical weighing bottles having an internal diameter of 3 cm and a height of 5 cm to the underside of the cover (which should be tightly closed) and heated for 3 hours at a constant temperature of 90° C in an oven in which they are clearly visible.

(2) During this time no nitrous gases must be visible. Observation and appraisal as under marg. 1151 (a).

(b) *Test of substances listed in marg. 1103, 2., and 1105*

(1) Two samples of explosive each weighing 10 g are put into cylindrical weighing bottles having an internal diameter of 3 cm and a height of 5 cm to the under side of the cover (which should be tightly closed) and heated for 48 hours at a constant temperature of 75° C in an oven in which they are clearly visible.

(2) During this time no nitrous gases must be visible. Observation and appraisal as under marg. 1151 (a).

**1153** IGNITION TEMPERATURE (see marg. 1101 and 1102)

(1) The ignition temperature is determined by heating 0.2 g of substance enclosed in a glass test tube immersed in a Wood's alloy bath. The test tube is placed in the bath when the latter has reached 100° C. The temperature of the bath is then raised progressively by 5° C per minute.

(2) The test tubes must have the following dimensions:

Length .....	125 mm
Internal diameter .....	15 mm
Wall thickness .....	0.5 mm

and must be immersed to a depth of 20 mm.

(3) The test must be repeated three times, the temperature at which ignition of the substance occurs, i.e., slow or rapid combustion, deflagration or detonation, being noted each time.

(4) The lowest temperature recorded in the three tests is the ignition temperature.

**1154** TEST FOR SENSITIVITY TO RED HEAT AND TO IGNITION (see marg. 1103 to 1110)

(a) *Test in red-hot hemispherical iron crucible* (see marg. 1103 to 1106 and 1108 to 1110)

(1) Quantities of the explosive to be examined increasing from 0.5 g to 10 g are thrown into a red-hot hemispherical iron crucible 1 mm thick and 120 mm in diameter.

The results of the test are to be classified as follows:

1. Ignition with slow combustion (explosives with an ammonium nitrate base),
2. Ignition with rapid combustion (chlorate explosives),
3. Ignition with violent combustion and deflagration (black powder),
4. Detonation (fulminate of mercury).

(2) The effect on the sequence of events of the amount of explosive used should be taken into account.

(3) The explosive to be examined must not show any fundamental difference from the standard explosive.

(4) The iron crucibles must be carefully cleaned before each test and replaced at frequent intervals.

(b) *Test for ease of ignition* (see marg. 1103 to 1110)

(1) The explosive to be examined is placed in a small heap on an iron plate in quantities increasing—in the light of the results of the tests under (a)—from 0.5 g to a maximum of 100 g.

(2) A burning match is applied to the apex of the small heap and note is taken whether the explosive ignites and burns slowly, deflagrates or detonates, and whether, once ignition has occurred, combustion continues even after the match has been removed. If no ignition takes place, a similar test is made by bringing the explosive into contact with a gas flame and noting the same points.

(3) The results of the test are compared with those obtained with the standard explosive.

(c) *Combustion test in a confined space in a sheet-steel box* (see marg. 1107)

(1) The combustion test is carried out in a cubical box made of sheet steel with edges 8 cm long and a wall thickness of 1 mm. The box is made of annealed mild sheet steel and closed in as tight a manner as possible by folding the edge of the lid over (fig. 1).

(2) In the case of explosives sensitive to friction, the top surface should be covered with a sheet of paper to prevent particles of explosive from finding their way between the edges and remaining trapped there when the edge of the lid is being bent over. The box is completely filled with the explosive so that the latter has as nearly as possible the same density as when in cartridges. The box is placed in the fire with care; it shall first be wrapped in, for example, several layers of packing paper to avoid immediate ignition of the explosive.

A pile of wood 0.8 m high is prepared for the fire by first placing on the ground a thin layer of wood-wool and then on top of it, lying flat, three billets about 0.5 m long and 0.25 m in diameter. Across these are laid three more billets of similar size. On top of all are placed three layers of small sticks cut about 0.2 m long, with wood-wool between the layers. On each side, three or four pieces of wood about 0.5 m long are leant against the pile to prevent it from collapsing while it burns. The pile is set alight with a lighted fuse of wood-wool.

(3) Observations are made to see whether the explosive flares or explodes; how long combustion lasts and what characteristics it shows; and what changes the box undergoes.

(4) The test is carried out four times. A photograph is taken of the steel boxes after they have been used.

(d) *Test by heating in a confined space in a steel tube with a calibrated orifice plate (steel-tube test)* (see marg. 1103 to 1110 and 1112)

(1) The tests in (a) to (c) may be supplemented by the following test.

(2) Description of the steel tube (fig. 2):

The tube is made by pressing from sheet steel suitable for deep drawing\*. The dimensions are: inner diameter 24 mm; wall thickness 0.5 mm; length 75 mm. The open end is fitted with an outer flange. The tube is closed with a pressure-resistant central-orifice plate fixed tightly on the flange by a threaded collar slipped over the tube and by a box nut screwed onto this collar. The plate is made from heat-resisting chrome steel\*\* 6 mm thick. To allow the escape of gases of decomposition, plates are used having cylindrical central orifices (a) with the following diameters: 1.0 – 1.5 – 2.0 – 2.5 – 3 – 4 – 5 – 6 – 8 – 10 – 12 – 14 – 16 – 18 – 20 mm; to these must be added the diameter of 24 mm when the tube is used without orifice plate and closing device. The threaded collar and nut are made of manganese-chrome steel, heat-resistant up to 800° C\*\*\*. With orifice plates of from 1 to 8 mm diameter, nuts with a perforation (b) 10 mm in diameter must be used; if the diameter of the orifice is above 8 mm, that of the nut must be 20 mm. Each tube is used for one test only. On the other hand, the orifice plates, threaded collars and nuts may be used again provided they are undamaged. As a check the orifice must be measured after each test.

(3) Heating and protective device (fig. 3):

Heating is provided by town gas with a net calorific power value of 4,000 kcal/m<sup>3</sup>, from 4 burners producing about 2.4 kcal/sec. for a consumption of 0.6 l/sec.

As destruction of the tube is possible heating is undertaken in a splinter-proof welded box made of steel 10 mm thick, open on one side and on top. The tube is suspended between two rods 4 mm in diameter inserted through holes drilled in opposite walls of the box, and is then heated by four Teclu burners (external tube diameter 19 mm), the lowest heating the bottom of the tube, those at the right and left the walls, and that at the rear the closure. The burner tubes are inserted and secured in holes 20 mm in diameter drilled in the walls of the splinter-proof box. The burners are lit simultaneously by a pilot jet and regulated by a strong inflow of air so that the tips of the blue inner cones of the flames are almost touching the tube.

The whole installation is contained in a test stand separated from the observation area by a strong wall in which sight holes protected by armoured glass and slatted steel plates are arranged. The splinter-proof box is placed with its open side towards the observation area, care being taken that the flames are not affected by any draughts. Equipment for extracting gases of decomposition and smoke from the explosion is installed in the test room.

If town gas is not available, propane can be used for heating. In such a case the propane is taken from an industrial cylinder fitted with a pressure regulator

\* E.g. Material Specification No. I.0336.505 g. in accordance with DIN 1623 Sheet 1.

\*\* E.g. Material Specification No. I.4783, in accordance with Sheet "Stahl-Eisen-Werkstoff" 490-52.

\*\*\* E.g. Material Specification No. I.3817, in accordance with Sheet "Stahl-Eisen-Werkstoff" 490-52.

(500 mm water gauge) through a meter (bellows-type meter with a capacity of 2 litres at 500 mm water gauge), and distributed by a manifold to the four burners, whose jets have a diameter of 0.8 mm. Each burner consumes not more than about 1.7 litres of propane a minute. The gas cylinders and the meter are placed outside the test stand.

(4) Test procedure:

The tube is filled with the explosive substance to within 15 mm of the brim, i.e. to a height of 60 mm. If the substance is in powdered form, it is compressed by gentle and cautious taps on the tube, and then by light pressure with a small wooden rod. If the substance is gelatinous, it is put into the tube with a spatula; after each addition the substance is lightly pressed down with a small wooden rod to eliminate air bubbles. When the quantity of substance inserted has been weighed, the threaded collar is slipped onto the tube, the required orifice plate is put in place and the nut is tightened by hand. It is essential to check that none of the substance is trapped between the flange and the plate, or in the threads. The tube is then put in a rigidly mounted vice, with shielding against premature explosion and the nut is fully tightened with a spanner. The tube, now ready for the test, is suspended between the two rods in the splinter-proof box; the pilot jet is lighted and, after closure of the test stand, the gas supply to the four burners is turned on. At the same time, a stop-watch is started to measure the time  $t_1$  elapsing between the lighting of the burners and the ignition of the substance as shown by the escape of a flame from the orifice in the plate and the time  $t_2$  between lighting and explosion. Once the test is completed, the gas supply is turned off and the exhaust system in the test stand is started up; no one is allowed into the stand until sufficient time has elapsed.

To make sure that the heating device is working satisfactorily, tests must be preceded by a "dummy run".

(5) Interpretation of results:

The relative degree of sensitivity of a substance to heating in the steel tube is expressed by the limiting diameter, this being the largest orifice diameter in millimetres with which, in three tests, at least one tube explodes, that is to say breaks up into at least three pieces.

The thermal sensitivity is greater as the limiting diameter increases and times  $t_1$  and  $t_2$  decrease.

Organic peroxides (except those wetted or diluted with volatile substances, e.g. water) for which the limiting diameter is equal to or greater than 2.0 mm should be considered as explosive substances of Class I a (see also note to marg. 700).

(e) *Heating test in a pressure vessel with an orifice plate and bursting disc (pressure-vessel test)* (see marg. 1112).

(1) For organic peroxides, the tests shown under (a), (b) and (d) may be supplemented by the following test.

(2) Description of the pressure vessel (figs. 4 to 6):

The diagrams 4 to 6 and the appropriate captions give the details of the apparatus used and the dimensions and materials of the constituent parts.

It should be noted that the use of 24 plates is provided for, the diameters of the orifices being: 1.0 – 1.2 – 1.5 – 2.0 – 2.5 – 3.0 – 3.5 – 4.0 – 4.5 – 5.0 – 5.5 – 6.0 – 7.0 – 8.0 – 9.0 – 10.0 – 11.0 – 12.0 – 14.0 – 16.0 – 18.0 – 20.0 – 22.0 – and 24.0 mm. These plates have a thickness of 2.0 mm  $\pm$  0.2 mm.

The bursting disc is cut by a punch from a sheet of brass 0.05 mm thick, withstanding a bursting pressure of 5.4  $\pm$  0.5 kg/cm<sup>2</sup> at normal temperature. Brass rolled, not annealed, containing 67% copper is suitable.

(3) Heating device:

The pressure vessel is heated by technical-grade butane taken from a cylinder fitted with a pressure regulator. The heat output must be about 2,700 kcal/h. With a net calorific value of 27,000 kcal/m<sup>3</sup> (at 1 atm and 20° C), the rate of gas supply must be about 100 l/h. A Teclu butane burner is used. The amount of gas used is measured by a rotameter or other meter and regulated by the burner valve.

Instead of butane, town gas or propane may be used with a suitable burner, provided that the heat output of the gas is likewise about 2,700 kcal/h (for example, in the case of town gas with a net calorific value of 4,050 kcal/m<sup>3</sup>, it would be necessary to supply about 670 l/h).

The gas cylinder and the rotameter or other meter must be situated outside the test area.

(4) Test procedure:

For a normal test, 10 grams of the substance are placed in the vessel. In the case of a substance the sensitivity of which is unknown, a start is made with smaller quantities: 1 gram to begin with, then (if possible) 5 grams, and finally 10 grams. The bottom of the vessel must be evenly covered with the substance. The bursting disc, central-orifice plate and retaining ring are then put in place. The wing nuts are tightened by hand and the box nut with a spanner. The bursting disc is covered with enough water to keep it at a low temperature.

The pressure vessel is placed on a tripod (with an inside ring diameter of 67 mm) which is inside a protective cylinder. The ring at the bottom of the vessel rests on the tripod.

The burner is lit; the flow of gas is set at the required rate and the flow of air is so adjusted that the colour of the flame is blue and the inner cone of the flame light blue. The tripod must be of such a height that the inner cone almost touches the bottom of the vessel. Then the burner is placed under the vessel through a hole in the protective cylinder.

The test area must be very well ventilated and admission to it prohibited during the test. The vessel is observed from outside either by mirrors or through a sight hole in the wall, fitted with armoured glass.

The time  $t_1$  between the commencement of heating and the commencement of a reaction (flame, production of smoke, hissing) and the time  $t_2$  until the end of the reaction (detonation, end of hissing and production of smoke, or extinction of the flame) are measured. The vessel is then cooled with water and cleaned.

(5) Interpretation of results:

The relative degree of sensitivity of a substance to heating in the pressure vessel is expressed by the limiting diameter, this being the largest orifice diameter in millimetres with which the bursting disc is broken at least once in three tests, while having remained intact during three tests with the next larger diameter.

The thermal sensitivity is greater as the limiting diameter increases and times  $t_1$  and  $t_2$  decrease.

Organic peroxides (except those wetted or diluted with volatile substances, e.g. water) for which the limiting diameter is equal to or greater than 9 mm should be considered as explosive substances of Class I a (see also note to marg. 700).

**1155** TEST FOR SENSITIVITY TO IMPACT (see marg. 1103 to 1110 and 1112)

(a) *Fall-hammer test I (figs. 7 and 8) against a standard (control) explosive*

(1) The explosive, after drying as described in marg. 1150, is put into the following form:

- (a) Compact explosives are rasped fine enough to pass through a sieve of 1 mm mesh; only the residue remaining on a sieve of 0.5 mm mesh is kept for the following test;
- (b) Explosives in powdered form are passed through a sieve of 1 mm mesh; all that passes through this sieve is kept for the impact test;
- (c) Plastic and gelatinous explosives are formed into small, roughly spherical pills weighing between 25 and 35 mg.

(2) The apparatus for carrying out the test consists of a weight which, sliding between two bars, is capable of being set to fall from a prearranged height and of being readily released for the fall. The weight does not fall directly onto the explosive, but falls onto a striker D resting on an anvil E, both in very hard steel and sliding easily in the guide ring F (fig. 7). The sample of explosive is placed between the striker and the anvil. The striker, anvil and guide ring are in a protective cylinder C made of hardened steel and placed on a steel block B embedded in a cement block A (fig. 8). The dimensions of the various parts are given in the figures.

(3) The tests are carried out in turn on the explosive to be tested and on the standard (control) explosive as follows:

- (a) The explosive, in the form of a spherical pill (if it is plastic) or measured with a measuring spoon of 0.05 cm<sup>3</sup> capacity (if it is in the form of a powder or of raspings), is arranged with care between the striker and the anvil, whose contact surfaces must not be moist. The ambient temperature must not exceed 30° C nor be less than 15° C. Each sample of the explosive must be subjected to one impact only. After each test the striker, the anvil and the guide ring must be carefully cleaned, any residue of explosive being removed.
- (b) The tests must begin at heights of fall likely to cause complete explosion of the explosives under test. The height of fall is reduced gradually until the resulting explosion is incomplete or no explosion results. At this height four impact tests are carried out, and if at least one produces a definite explosion, four further fall tests from a slightly lower height are carried out, and so on.
- (c) The lowest height of fall causing a definite explosion in a series of at least four tests at that height is taken as the limit of sensitivity.
- (d) The impact test is normally carried out with a drop weight of 2 kg; however, if the sensitivity to impact with this weight requires a height of fall greater than 60 to 70 cm, the impact test must be carried out with a weight of 5 kg.

(b) *Fall-hammer test II (figs. 9 to 13) with numerical expression of impact sensitivity (impact energy in kgm)*

(1) The test described in (a) may be replaced by the following test.

(2) Description of the apparatus:

The essential parts of the apparatus are the impact device [see under (4)], the cast-steel block with base, the anvil, the column, the guides and the hammer with release device (fig. 9). A steel anvil (100 mm in diameter, 70 mm high) is screwed on the steel block (230 × 250 × 200 mm) cast integral with the base (450 × 450 × 60 mm). Bolted to the back of the steel block is the support into which the column formed from a seamless-drawn steel tube (90 mm outside diameter, 75 mm inside diameter) is fixed. The two guides are fixed to the column by means of three cross-members and are fitted with a toothed rack to limit the rebound of the hammer and with a movable graduated scale for setting the height of fall. The hammer holding and releasing device is adjustable between the guides and is clamped to them by the operation of a lever-nut on two jaws. The apparatus is so fixed on a concrete block (600 × 600 × 600 mm) by means of four anchoring

screws sealed in the concrete that the base is in contact with the concrete over its whole area and the guides are exactly vertical. A wooden splinterproof box which has a lead lining 2 mm thick and opens easily surrounds the apparatus up to the level of the bottom cross-member. An exhauster enables the explosion gases and dust from the substance to be removed.

(3) Description of the fall-hammers:

Each hammer is provided with two positioning grooves holding it between the guides as it drops and with a suspension spigot, a removable cylindrical striking head and a rebound catch which are screwed on to the hammer (fig. 10). The striking head is of hardened steel (HRC 60 to 63); its minimum diameter is 25 mm; it has a shoulder preventing it from being forced into the hammer by the impact.

There are three hammers of different weights. The 1-kg hammer is used for highly sensitive substances, the 5-kg hammer for substances of medium sensitivity and the 10-kg hammer for substances of low sensitivity. The 5-kg and 10-kg hammers are of massive and compact steel\*. The 1-kg hammer must have a heavy steel centre carrying the striking head and forming with it the main mass of the hammer.

The 1-kg hammer is used for drop heights of 10 to 50 cm (impact energy 0.1 to 0.5 kgm), the 5-kg hammer for drop heights of 15 to 60 cm (impact energy 0.75 to 3 kgm), and the 10-kg hammer for drop heights of 35 to 50 cm (impact energy 3.5 to 5 kgm).

(4) Description of the impact device:

The sample to be examined is enclosed in an impact device (fig. 11) consisting of two steel cylinders coaxially placed one above the other in a cylindrical guide ring likewise made of steel. The cylinders are steel rollers for anti-friction bearings and are 10 mm in diameter (type with a mean deviation of  $-4$  microns for a tolerance of  $-2$  microns, i.e. a diameter of  $10 \pm 0.003$  mm, 10 mm high, with polished surfaces and rounded edges (radius of curvature 0.5 mm) and an HRC hardness between 58 and 65. The guide ring has an outer diameter of 16 mm, a lapped bore of  $10 \pm 0.005$  mm and a height of 13 mm. A gauge may be used to check that the bore diameter is within the prescribed tolerances. The cylinders and the guide ring shall be degreased with acetone before use.

The impact device is placed on an intermediate anvil 26 mm in diameter and 26 mm high and centred by a locating ring provided with a ring of vent-holes to permit the escape of the gases (figs. 11 and 12). Each striking surface of the cylinders shall be used only once. If an explosion occurs, the guide ring shall not be used again.

(5) Preparation of the samples:

The explosive substances are tested in the dry state. Substances of marg. 21, items 11 to 14 and 16, are tested as delivered provided that their water content agrees with the value indicated by the manufacturer. If the water content is higher, the mixtures must be dried before the test until their moisture content is that indicated.

In addition, in the case of solid substances other than those in paste-like form the following points should be observed:

- (a) Substances in powdered form are sieved (sieve mesh 0.5 mm); everything that passes through the sieve is used for the test;

\* At least St 37-1, in accordance with DIN 17000.



(b) Substances which have been compressed, cast or otherwise consolidated are broken into small pieces and sieved; the siftings from 0.5 mm to 1.0 mm in diameter are used for the test.

(6) Test procedure:

In the case of substances in powdered form, a sample is taken with a cylindrical measure of 40 mm<sup>3</sup> capacity (3.7 mm diameter × 3.7 mm). For substances in paste-like form, a cylindrical tube of the same capacity is used, which is plunged into the mass. After levelling off the excess extending beyond the measure, the sample is taken out by means of a wooden rod. For explosive liquids a fine-drawn pipette of 40 mm<sup>3</sup> capacity is used.

The sample is placed in the open impact device, which is already in the locating ring on the intermediate anvil, and in the case of substances in powdered or paste-like form the upper steel cylinder is lightly and carefully pressed with the forefinger until it touches the sample without flattening it. In the case of liquid substances the upper steel cylinder is pressed down with the aid of the depth scale of a vernier gauge until it is 1 mm from the lower cylinder, and held in this position by a rubber ring previously slipped on to it (fig. 13).

The device is placed centrally on the anvil, the protective wooden box is closed, the hammer suspended at the required height is released, and the exhauster is then started up. The test is performed six times at each height of fall.

(7) Interpretation of results:

In interpreting the results of the test of sensitivity to impact, a distinction is made between "no reaction", "decomposition" (without flame or detonation; recognizable by colour-change or odour) and "explosion" [with weak to strong detonation\*]. The degree of sensitivity to impact of a substance is measured by determining the weight of the hammer in kg and the lowest height of drop in cm with which an explosion occurs in at least one out of six tests, and the resultant impact energy in kgm. The sensitivity of the substance to impact is greater the lower the impact energy in kgm.

1156 TEST FOR SENSITIVITY TO FRICTION (see marg. 1103 to 1110 and I112)

(a) *Friction test in a porcelain mortar*

(1) The explosive is dried over calcium chloride. A sample of the explosive is compressed and ground in an unglazed porcelain mortar by means of a pestle, also unglazed. The mortar and pestle must have a temperature about 10 degrees higher than the ambient temperature (15° to 30° C).

(2) The results of the test are compared with those obtained with the standard (control) explosive, and are classified as follows:

1. No effect;
2. Faint occasional crackling;
3. Frequent crackling or very pronounced occasional crackling.

(3) Explosives which, under test, give the result set out in 1. are to be considered as practically insensitive to friction; if they give the result set out in 2. they are to be considered as moderately sensitive to friction; if they give the result set out in 3. they are to be considered as very sensitive to friction.

\* For some substances there is "ignition without detonation". This reaction is, however, regarded as an explosion (and designated by the terms in inverted commas) because it involves the entire sample and an explosion can also occur under identical conditions.

(b) *Test with the friction apparatus* (figs. 14 and 15)

(1) The test described in (a) may be replaced by the following test.

(2) Description of the apparatus:

The friction apparatus is made up of a cast-steel base on which the friction device proper, comprising a fixed porcelain peg and a movable porcelain plate (fig. 14), is mounted. The porcelain plate is held in a carriage which runs in two guides. On operation of a push-button switch the carriage is moved by an electric motor through a connecting-rod, an eccentric disc and suitable gearing in such a way that the porcelain plate moves back and forth once only beneath the porcelain peg, the distance of travel being 10 mm. The peg-holder pivots on an axis so that the porcelain peg can be changed; it is extended by a loading arm with six notches for hanging a weight. Balance in the "zero" position (without weights) is achieved by adjusting a counter-weight. When the peg-holder is lowered on to the porcelain plate the longitudinal axis of the porcelain peg is perpendicular to the upper surface of the plate. One of the weights is hung by means of a ring and hook in the appropriate notch; the load on the peg can be varied from 0.5 to 36 kg.

(3) Description of the porcelain plate and peg:

The flat porcelain plates are made of pure technical white porcelain and have the following dimensions: 25 mm × 25 mm × 5 mm. Before being fired, their two rubbing surfaces are thoroughly roughened by being rubbed with a sponge. The sponge-marks are clearly visible.

The cylindrical porcelain pegs are also made of technical white porcelain; they are 15 mm long and 10 mm in diameter and their roughened ends are rounded, with a radius of curvature of 10 mm.

Samples of porcelain pegs and plates of the quality described above are deposited with the Bundesanstalt für Materialprüfung, Berlin-Dahlem, which can supply the addresses of manufacturers.

As the natural undamaged roughness of the plates and pegs is an essential condition for the reaction of the explosive substance, each part of the surface must be used only once. In consequence, the two end surfaces of each peg are sufficient for two tests, and the two friction surfaces of a plate will each serve for about three to six tests.

(4) Preparation of samples:

The explosive substances are tested in the dry state. Substances of marg. 21, items 11 to 14 and 16, are tested as delivered, provided that their water content agrees with the value indicated by the manufacturer. If the water content is higher, the mixtures must be dried before the test until their moisture content is that indicated.

In addition, for solid substances, except those in paste-like form, the following points should be observed:

(a) Substances in powdered form are sieved (sieve mesh 0.5 mm); everything that passes through the sieve is used for the test;

(b) Substances which have been compressed, cast or otherwise consolidated are broken into small pieces and sieved; everything that passes through a sieve mesh of 0.5 mm is used for the test.

(5) Test procedure:

A porcelain plate is fixed on the carriage of the friction apparatus so that the grooves of the sponge-marks on it run transversely to the direction of movement. The quantity to be tested, about 10 mm<sup>3</sup>, is taken from substances in powdered

form by means of a cylindrical measure (2.3 mm diameter × 2.4 mm); in the case of substances in paste-like form, the sample is measured by a cylindrical tube which is plunged into the mass. After levelling off the excess extending beyond the measure, the sample is taken out by means of a wooden rod and placed on the porcelain plate. The firmly clamped porcelain peg is set on the heaped-up quantity as shown in fig. 15; the loading arm is loaded with the required weight and the push-button switch is operated. Care must be taken to ensure that the peg rests on the sample and that there is enough of the substance in front of it to come under the peg as the plate moves.

(6) Interpretation of results:

In interpreting the results of the test, a distinction is made between "no reaction", "decomposition" (change of colour, smell), "ignition", "crackling" and "explosion".

The relative degree of sensitivity of a substance to friction in the friction apparatus as described is indicated (without taking the coefficient of friction into account) by the smallest load on the peg, in kg, with which ignition, crackling or an explosion occurs in at least one out of six tests. In this connexion, even ignition and crackling are deemed to be dangerous reactions. The sensitivity of an explosive substance to friction is greater the lower the ascertained load on the peg (loading weight in relation to length of loading peg).

Explosive liquids and substances in paste-like form are not in general sensitive to friction under the conditions of this test, since because of the lubricating effect the slight frictional heat produced is insufficient to induce ignition. With such substances the absence of any reaction is no indication that the substance is not dangerous.

1157 The stability of the products referred to in marg. 1111 is to be checked by ordinary laboratory methods.

1158 TEST OF DYNAMITE FOR EXUDATION (see marg. 1107)

(1) The apparatus for testing dynamite for exudation (figs. 16 to 18) consists of a hollow bronze cylinder. This cylinder, which is closed at one end by a plate of the same metal, has an internal diameter of 15.7 mm and a depth of 40 mm. It is pierced by 20 holes 0.5 mm in diameter (4 sets of 5 holes) on the circumference. A bronze piston, cylindrical over 48 mm of its total length of 52 mm, can slide in the vertical cylinder; this piston, whose diameter is 15.6 mm, is loaded with a weight of 2,220 g so as to produce a pressure of 1.2 kg/cm<sup>2</sup>.

(2) A small plug of dynamite weighing 5 to 8 g, 30 mm long and 15 mm in diameter, is wrapped in very fine gauze and placed in the cylinder; the piston and its loading weight are then placed on it so that the dynamite is subjected to a pressure of 1.2 kg/cm<sup>2</sup>.

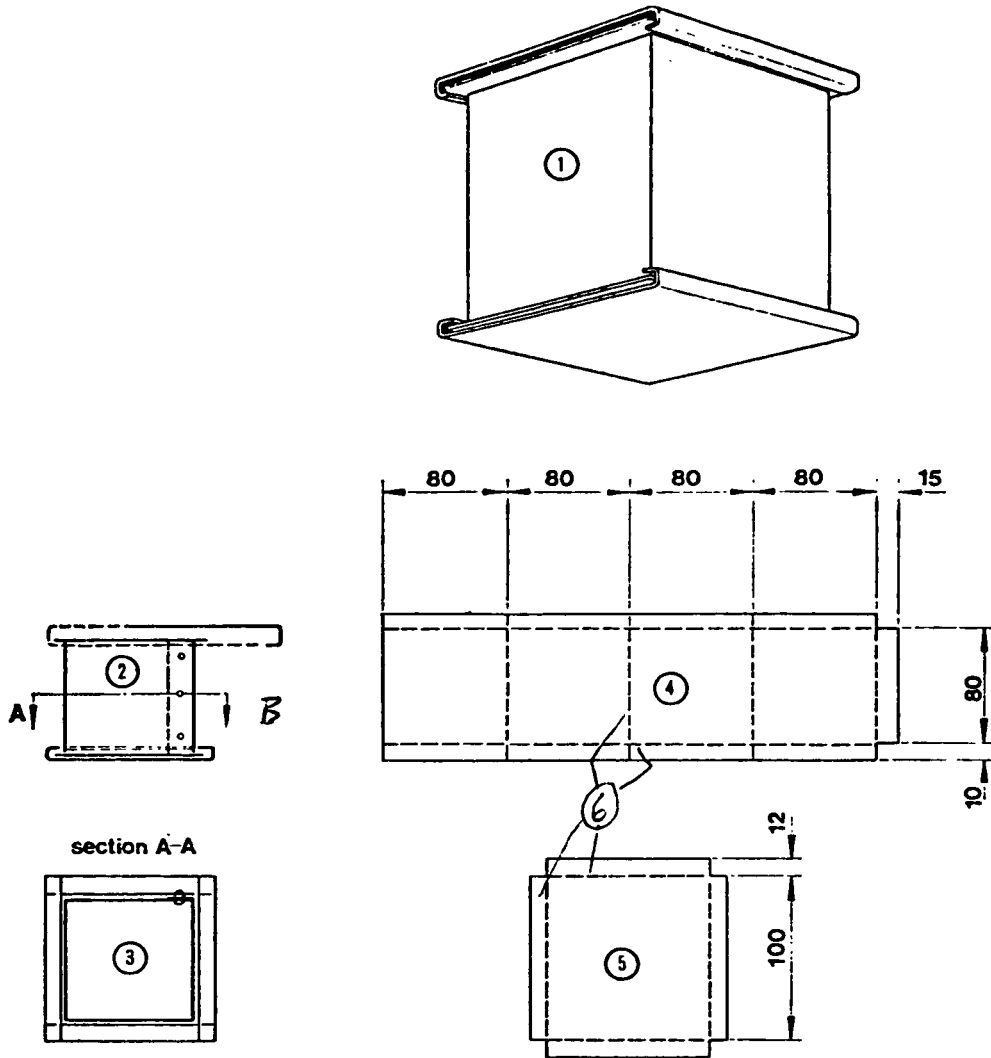
The time taken for the appearance of the first signs of oily droplets (nitro-glycerine) at the outer orifices of the cylinder holes is noted.

(3) The dynamite is considered satisfactory if the time elapsing before the appearance of the liquid exudations is more than 5 minutes, the test having been carried out at a temperature of 15° to 25° C.

1159-  
1199

*Combustion test*

Re marg. 1154 (c)



*Fig. 1: Steel box*  
 thickness of wall 1 mm  
 dimensions in mm

- (1) general view
- (2) vertical section
- (3) section A-B
- (4) fabrication of wall
- (5) fabrication of base and cover
- (6) edges to be folded

*Test by heating in a steel tube with a calibrated orifice plate*

Re marg. 1154 (d)

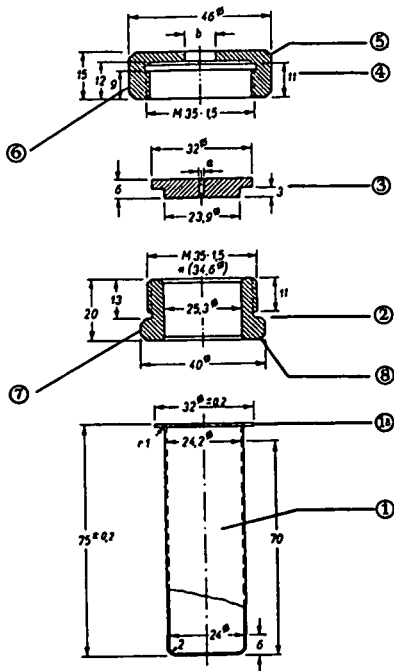


Fig. 2: Steel tube and accessories

dimensions in mm; for construction materials see marg. 1154 (d) (2) & (3)

- (1) tube
- (1a) outer flange
- (2) threaded collar; low-friction thread
- (3) orifice plate  
a = 1.0 . . . 20.0 diam.
- (4) nut  
b = 10 . . . 20 diam.
- (5) chamfered surface
- (6) 2 flats for spanner size 41
- (7) 2 flats for spanner size 36

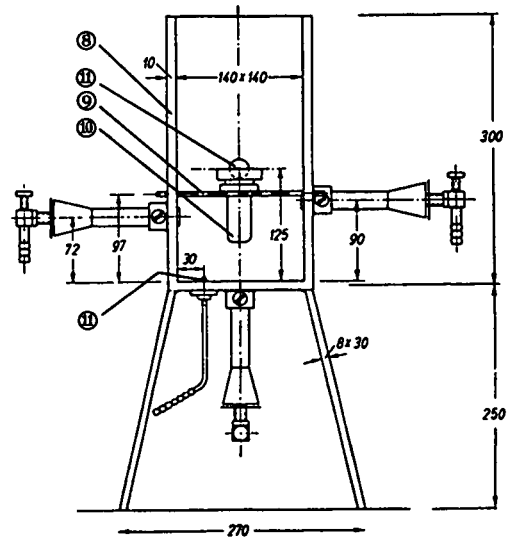
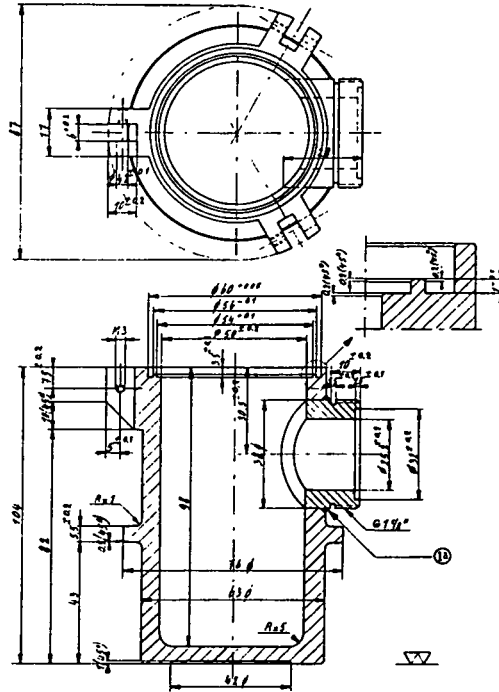
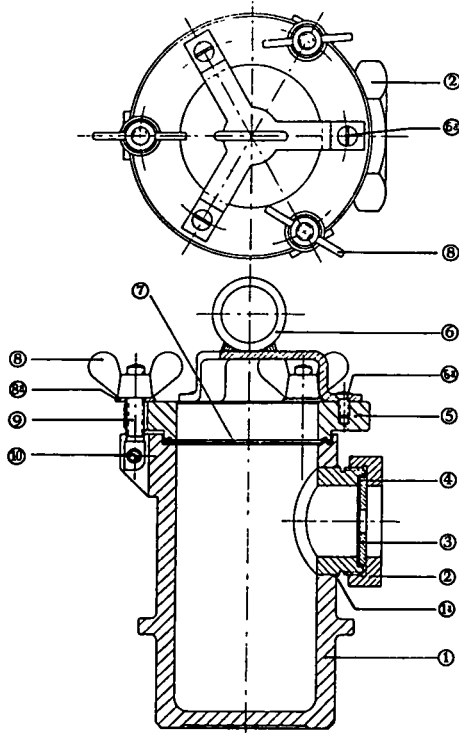


Fig. 3: Heating and protective device

- (8) splinter-proof box
- (9) 2 supporting rods for the tube
- (10) assembled tube
- (11) position of rear burner;  
the other burners are visible.
- (12) pilot jet

*Heating test in a pressure vessel with an orifice plate  
and bursting disc*

Re marg. 1154 (e)



*Fig. 4: Assembled pressure vessel;  
vertical section and plan*

*Fig. 5: Pressure vessel  
dimensions in mm*

- (1) pressure vessel (stainless steel)
- (1a) welded joint
- (2) box nut (fully-killed weldable steel)
- (3) central-orifice plate (stainless steel)
- (4) inert retaining ring, 0.5 thick
- (5) pressure ring (stainless steel)
- (6) brass handle
- (6a) brass screw (material M4 × 8 DIN 88)
- (7) bursting disc [for material see marg. 1154 (e) (2)]
- (8) wing nuts (brass M6 DIN 315)
- (8a) washer (brass 6 DIN 125)
- (9) eye-bolt (stainless steel)
- (10) pivot for wing nuts (stainless steel)

*Note:* Stainless steel having the following average composition is considered suitable:  
Cr 18%, Ni 9%, Mn ≤ 2%, Si ≤ 1%,  
C ≤ 0.12%

Heating test in a pressure vessel with an orifice plate and bursting disc

Re marg. 1154 (e)

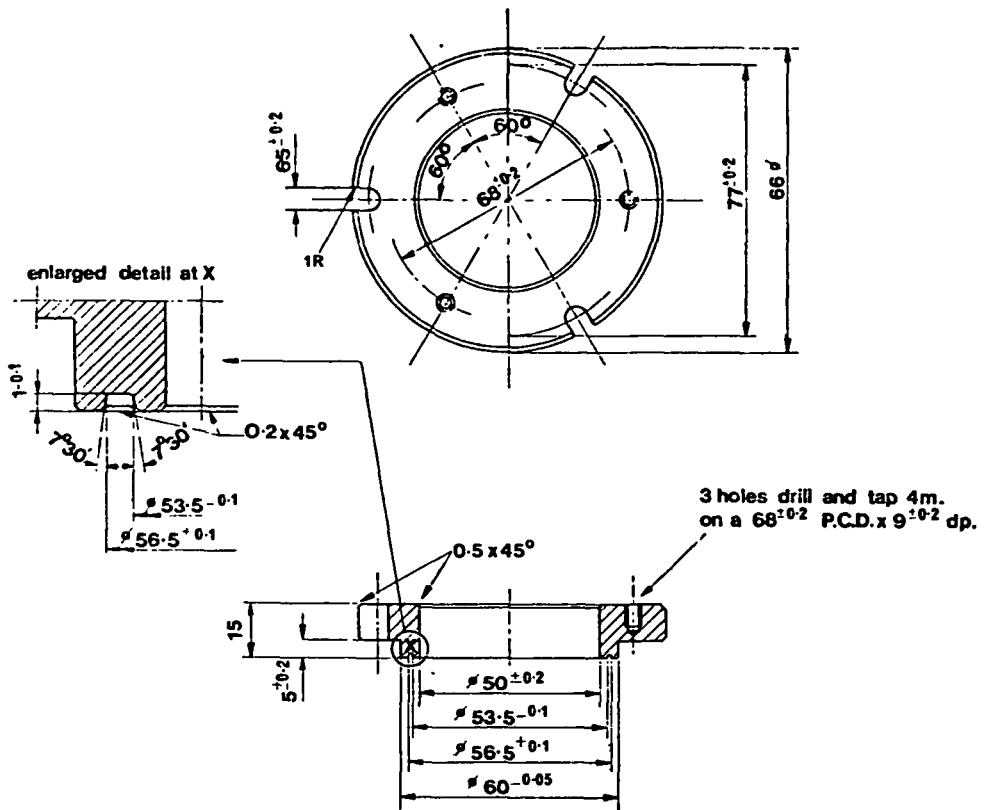


Fig. 6: Pressure ring of the vessel;  
Details in vertical section and plan view  
dimensions in mm

*Fall-hammer test I*

Re marg. 1155 (a)

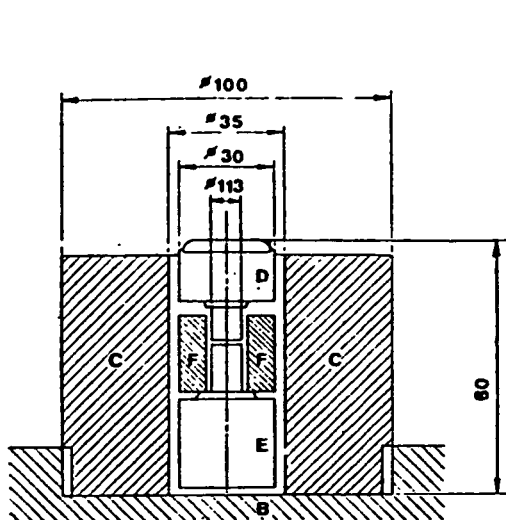


Fig. 7: Impact device, vertical section dimensions in mm

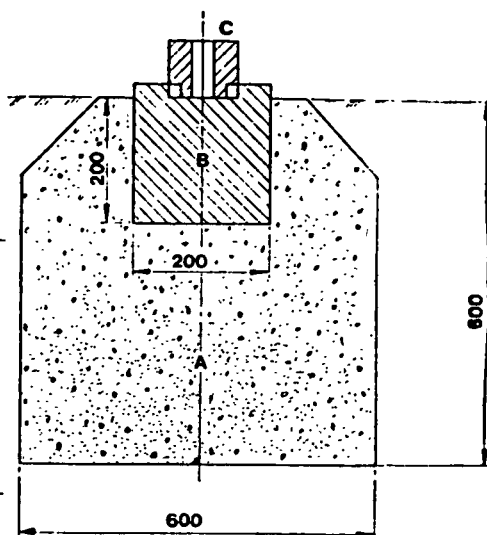


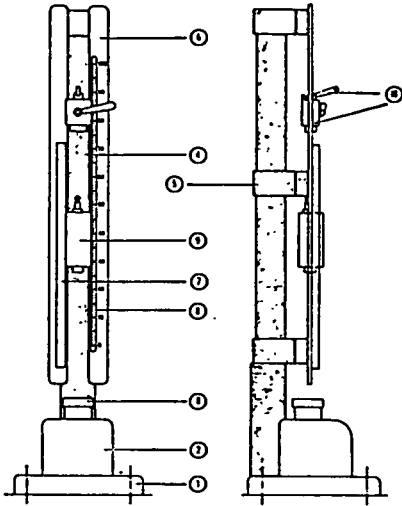
Fig. 8: Base for impact device, vertical section dimensions in mm

- A. concrete cement block
- B. steel block
- C. protective cylinder
- D. striker
- E. anvil
- F. guide ring



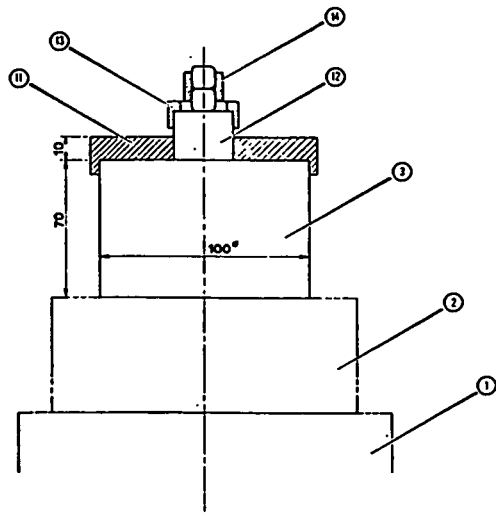
*Fall-hammer test II*

Re marg. 1155 (b)



*Fig. 9: Fall-hammer test II, front and side general view dimensions in mm*

- (1) base, 450 × 450 × 60
- (2) steel block, 230 × 250 × 200
- (3) anvil, 100 diam × 70
- (4) column
- (5) middle cross-member
- (6) 2 guides
- (7) toothed rack
- (8) graduated scale
- (9) fall-hammer
- (10) holding and releasing device

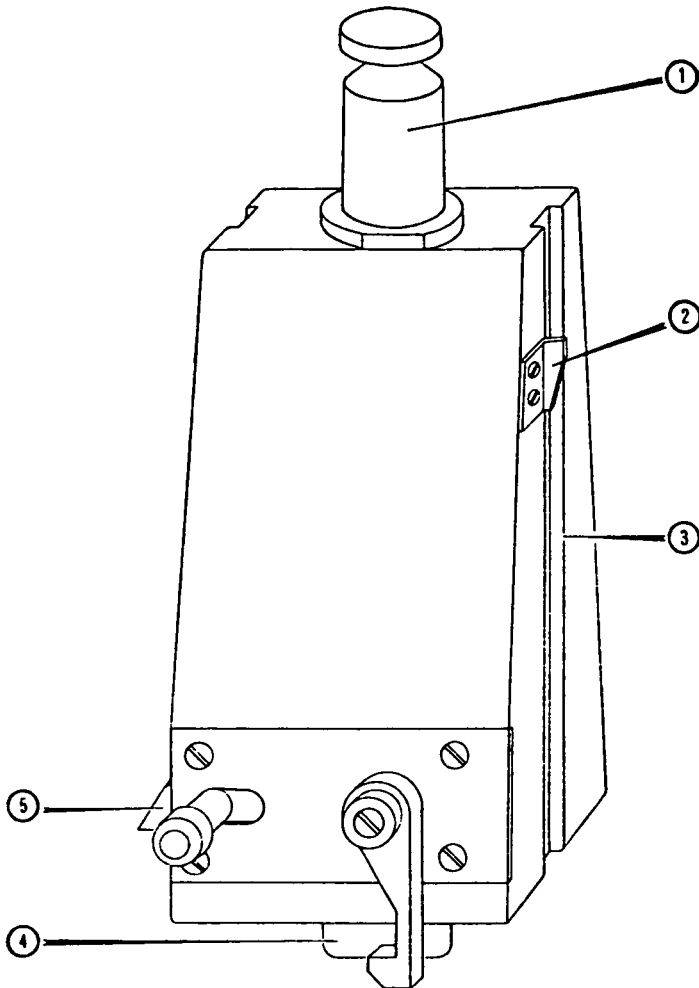


*Fig. 10: Fall-hammer test II, lower part dimensions in mm*

- (1) base, 450 × 450 × 60
- (2) steel block, 230 × 250 × 200
- (3) anvil, 100 diam × 70
- (11) locating plate
- (12) intermediate anvil (interchangeable), 26 diam × 26
- (13) locating ring with orifices
- (14) impact device

*Fall-hammer test II*

Re marg. 1155 (b)



*Fig. 11: Hammer (drop weight) of 5 kg.*

- (1) suspension spigot
- (2) height marker
- (3) positioning groove
- (4) cylindrical striking head
- (5) rebound catch

## Fall-hammer test II

Re marg. 1155 (b)

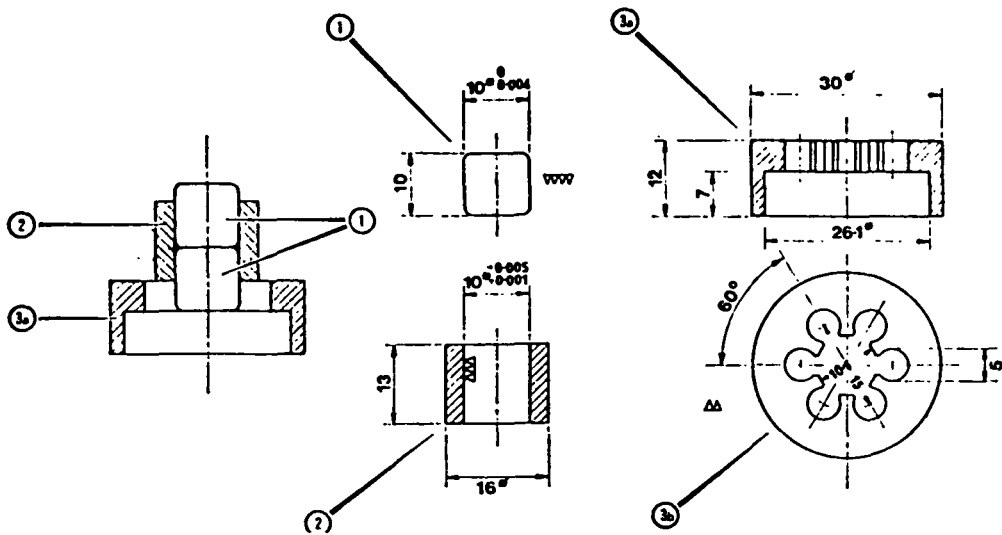


Fig. 12: Impact device for substances in powdered form or paste-like form  
dimensions in mm

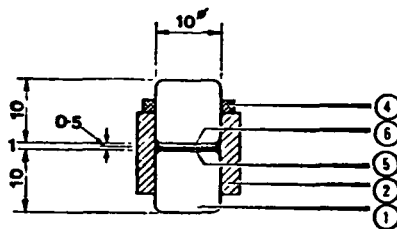


Fig. 13: Impact device for liquid substances  
dimensions in mm

- |                                     |  |
|-------------------------------------|--|
| (1) steel cylinders*                | (4) rubber ring                            |
| (2) guide ring for steel cylinders* | (5) liquid substance (40 mm <sup>3</sup> ) |
| (3) locating ring with orifices     | (6) space free from liquid                 |
- (a) vertical section  
(b) plan

\* Steel can have the following composition:  
Cr ± 1.55%, C ± 1.0%, Si max 0.25,  
Mn ± 0.35%—HRC 58 . . . 65  
(heat-treated steel)

*Test with friction apparatus*

Re marg. 1156 (b)

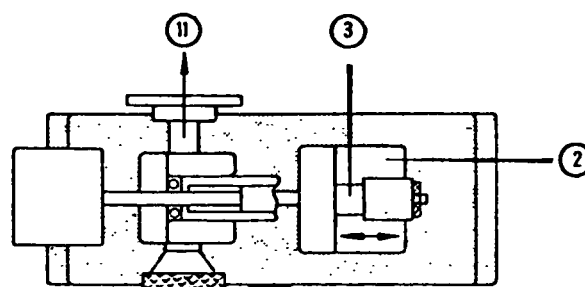
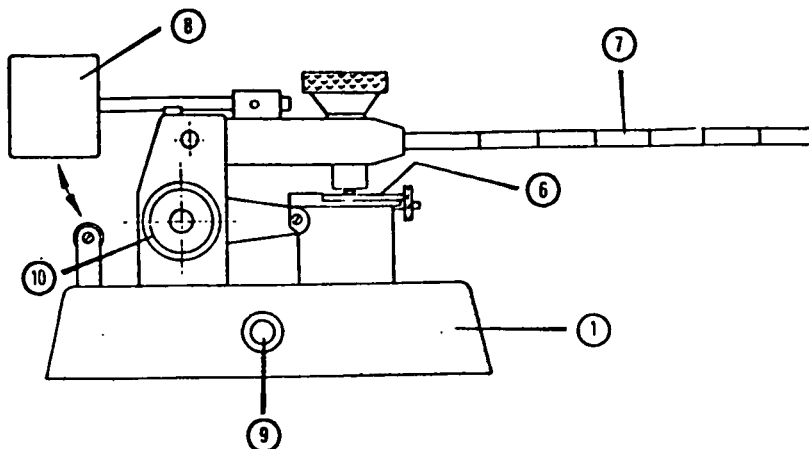


Fig. 14: Friction apparatus; vertical and plan view

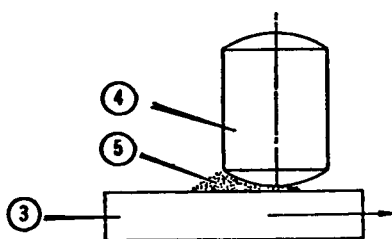


Fig. 15: Starting position of peg on sample

- |   |   |
|---|---|
| (1) steel base  | (7) loading arm   |
| (2) movable carriage                                      | (8) counterweight   |
| (3) porcelain plate, 25 × 25 × 5 mm, held on the carriage | (9) switch  |
| (4) fixed porcelain peg. 10 diam × 15 mm                  | (10) handle for setting the carriage at starting position |
| (5) sample under test, approx. 10 mm <sup>3</sup>         | (11) direction to electric drive motor                    |
| (6) peg-holder  |   |

*Test of dynamite for exudation*

Re marg. 1158

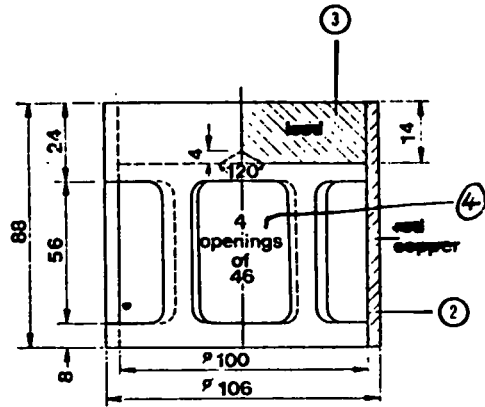
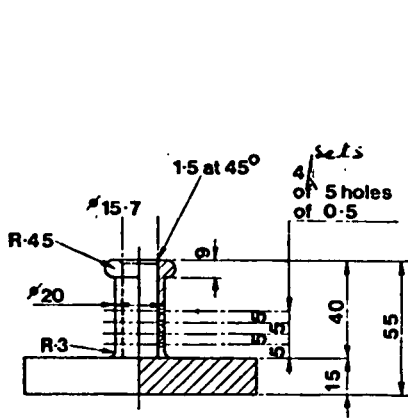


Fig. 17: Bell-shaped weight of 2,220 g, capable of being suspended on the bronze piston

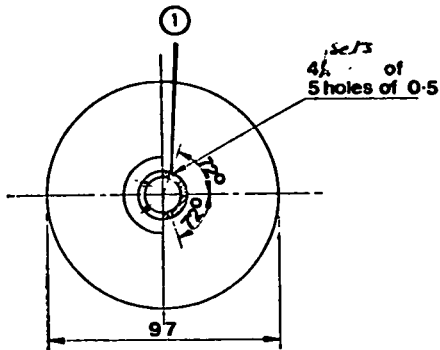


Fig. 16: Hollow bronze cylinder, closed at one end; plan and vertical section dimensions in mm

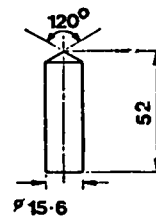


Fig. 18: Cylindrical bronze piston dimensions in mm

- (1) 4 sets of 5 holes of 0.5 diam
- (2) copper
- (3) lead plate with central tapered recess on underside
- (4) 4 openings, about 46 × 56, evenly spaced round periphery

## APPENDIX II

## A. RECOMMENDATIONS RELATING TO THE NATURE OF ALUMINIUM-ALLOY RECEPTACLES FOR CERTAIN GASES OF CLASS I D

I. *Quality of the material*

1200 (1) The materials of aluminium-alloy receptacles which are to be accepted for the gases included in marg. 133 (2) (b) should satisfy the following requirements:

	Materials for receptacles subjected to a test pressure		
	up to 30 kg/cm <sup>2</sup>	up to 60 kg/cm <sup>2</sup>	up to 375 kg/cm <sup>2</sup>
Brinell hardness HB in kg/mm <sup>2</sup> .....	55 to 65	75 to 95	105 to 140
Tensile strength $\beta_z$ in kg/mm <sup>2</sup> .....	22 to 26	26 to 30	38 to 55
Yield stress $\sigma_f$ in kg/mm <sup>2</sup> (permanent set $\lambda = 0.2\%$ ) .....	10 to 14	17 to 21	23 to 41
Permanent elongation at fracture ( $l = 5 d$ ), % .....	30 to 22	22 to 19	16 to 12
Bending coefficient k (bend test on circumferential test pieces)			
External surface in tension } .....	40 to 30	30 to 25	24 to 13
Internal surface in tension }			
Impact strength $\chi$ in kgm/cm <sup>2</sup> .....	4	3	3 to 2.5

Intermediate values must be read from the diagrams in marg. 1203.

NOTE. 1. The characteristics above are based on previous experience with the following materials used for receptacles:

Test pressure up to 30 kg/cm<sup>2</sup>: alloys of aluminium and magnesium;

Test pressure up to 60 kg/cm<sup>2</sup>: alloys of aluminium, silicon and magnesium;

Test pressure up to 375 gk/cm<sup>2</sup>: alloys of aluminium, copper and magnesium.

2. The permanent elongation at fracture ( $l = 5 d$ ) is measured by means of a test-piece of circular section in which the gauge length  $l$  is equal to five times the diameter  $d$ ; if test-pieces of rectangular section are used, the gauge length must be calculated from the formula  $l = 5.65 \sqrt{F_0}$  where  $F_0$  indicates the initial cross-sectional area of the test-piece.

3. The bending coefficient  $k$  is defined as follows:  $k = 50 \frac{s}{r}$ , where  $s$  = wall thickness in cm and  $r$  = mean radius of curvature in cm. To calculate the effective value of  $k$  with the external and internal surfaces in tension, account must be taken of the bending coefficient  $k_0$  for the initial condition (mean radius  $r_0$ ).

If, in the case of the appearance of a crack in the external (internal) surface under tension, the mean radius of curvature at the place is  $r_1$  ( $r_2$ ) cm, the bending coefficient  $k_1$  ( $k_2$ ) is used to calculate the effective bending coefficients as follows:

Coefficient  $k_{\text{exterior}} = k_1 - k_0$  and coefficient  $k_{\text{interior}} = k_2 + k_0$ .

4. The impact strength data relate to tests carried out in accordance with standard No. 10925 of November 1950 of the VSM (Verein Schweiz. Maschinindustrieller).

(2) The following tolerances are allowed as regards the values of the material indicated in (1): permanent elongation at fracture minus 10% of the figures given in the table above; bending coefficient minus 20%; impact strength minus 30%.

(3) The wall thickness of the aluminium-alloy receptacles at the thinnest point must be as follows:

If the diameter of the receptacle is less than 50 mm, not less than 1.5 mm,

If the diameter of the receptacle is from 50 to 150 mm, not less than 2.0 mm,

If the diameter of the receptacle is more than 150 mm, not less than 3.0 mm.

(4) The ends of the receptacles shall have a semicircular, elliptical or "basket-handle" section; they must afford the same degree of safety as the body of the receptacle.

II. *Additional official test for aluminium alloys containing copper*

1201 (1) In addition to the tests required by marg. 145, 146 and 147, it is further necessary to test for the possibility of intercrystalline corrosion of the inside wall of the receptacle if made of an aluminium alloy containing copper.

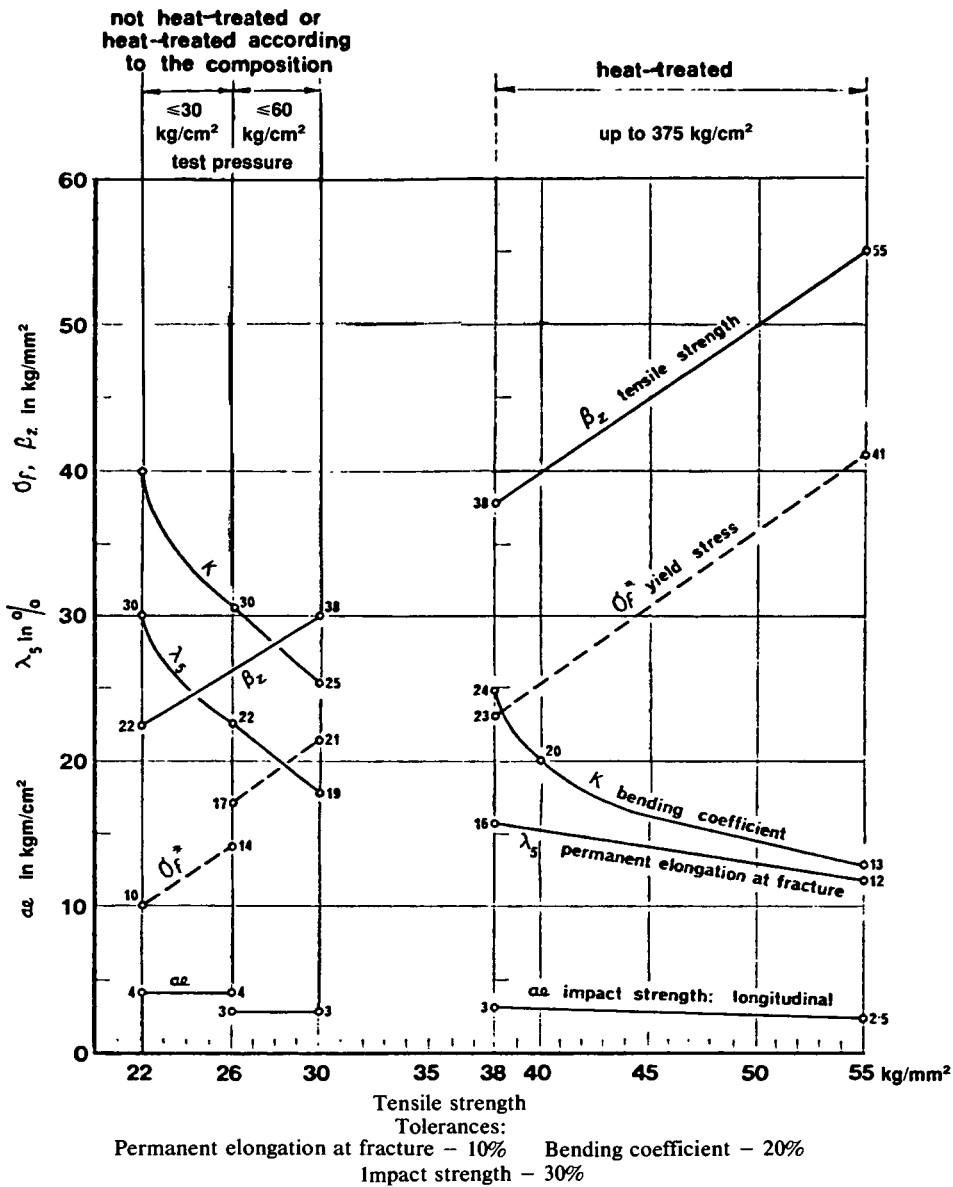
(2) When the inner side of a test-piece of 1,000 mm<sup>2</sup> (33.3 × 30 mm) of the material containing copper is treated with an aqueous solution containing 3% NaCl and 0.5% HCl at the ambient temperature for 72 hours, the loss of weight must not exceed 50 mg/1,000 mm<sup>2</sup>.

III. *Protection of the inner surface*

1202 The inner surface of aluminium-alloy receptacles must be covered with a suitable anti-corrosive substance if the competent testing stations consider this to be necessary.

1203

Aluminium-alloy receptacles



\* The yield stress  $\sigma_f$  must be at least equal to  $4/3$  of the circumferential stress  $\sigma_r$  at the test pressure

$$\text{circumferential stress } \sigma_r = \frac{P_i \cdot r_i}{100s} \text{ kg/mm}^2$$

$P_i$  = test pressure in kg/cm<sup>2</sup>  
 $r_i$  = internal radius in cm  
 $s$  = wall thickness in cm

1204-  
1249



B. REGULATIONS AND RECOMMENDATIONS CONCERNING THE MATERIALS AND CONSTRUCTION OF RECEPTACLES OF TANK WAGONS INTENDED FOR THE CARRIAGE OF DEEPLY REFRIGERATED LIQUEFIED GASES OF CLASS I D

I. Regulations

- 1250 (1) The receptacles of tank wagons shall be made of steel, aluminium, aluminium alloy, copper or brass. However, receptacles made of copper or brass shall be allowed only for gases containing no acetylene; ethylene may however contain not more than 0.005% acetylene.
- (2) For receptacles and their fittings and accessories, only materials appropriate to the lowest working temperature arising may be used.
- The temperature deemed to be the lowest working temperature for any given gas shall be that of the liquid phase at the time of filling.
- 1251 The following shall be allowed for the manufacture of receptacles:
- (a) Sheet steel:
1. Where the lowest working temperature is  $-40^{\circ}\text{C}$ : unalloyed, fully-killed (fine-grained) steel;
  2. Where the lowest working temperature is  $-110^{\circ}\text{C}$ : low-alloy steel, e.g. with 3.5% Ni, quenched and tempered;
  3. Where the lowest working temperature is  $-200^{\circ}\text{C}$ : austenitic high-alloy steel (e.g. Cr-Ni 18/8), quenched and either stabilized or with carbon content not exceeding 0.07%;
  4. Where the lowest working temperature is  $-270^{\circ}\text{C}$ : austenitic high-alloy steel (e.g. Cr-Ni 18/12), quenched and either stabilized or with a carbon content not exceeding 0.07%;
- (b) Aluminium sheet not less than 99.5% pure and aluminium-alloy sheet of the types Al-Mn, Al-Mg and Al-Zn-Mg;
- (c) Deoxidized-copper sheet not less than 99.9% pure and alpha-brass sheet with a copper content of 63 to 72%.
- 1252 (1) Receptacles made of steel, aluminium or aluminium alloy shall be either seamless or welded.
- (2) Receptacles made of copper or brass shall be either seamless, or welded, or hard-soldered.
- (3) The welds or hard-soldered joints shall be checked for strength.
- 1253 The fittings and accessories may be secured to the receptacles as follows:
- (a) Receptacles made of steel, aluminium or aluminium alloy: by welding;
- (b) Receptacles made of copper or brass: by welding or hard-soldering.
- 1254 The receptacles shall be so secured to the underframe of the tank wagon as to preclude with certainty any reduction of temperature likely to render any part of the underframe brittle. The fastenings of the receptacles shall themselves be so designed that even when the receptacle is at its lowest working temperature they still possess the necessary mechanical properties.
- 1255 The outside surfaces of the receptacles shall, if necessary, have been treated to prevent corrosion.
- 1256-  
1264

## II. Recommendations

## 1. Materials and receptacles

## (a) Steel receptacles

1265

The sheets used for the manufacture of receptacles and the receptacles themselves should satisfy the requirements set out in the following table:

*Steels for receptacles intended for deeply refrigerated liquefied gases*

Group	Working temperature capable of going down to	Materials				Receptacles or test-pieces taken from them		
		Kind	Impact strength (1)			Heat treatment	Impact strength (1)	
			Condition for test	Test temperature	Minimum value kgm/cm <sup>2</sup> (2)		Test temperature	Minimum value kgm/cm <sup>2</sup> (2)
1	2	3	4	5	6	7	8	9
I	-40° C	unalloyed fully-killed steel (fine-grained steel)	aged — compressed 10% and held at 250° C for 30 mins.	-40° C	3	stress-relieved at a temperature of 620 ± 20° C for at least 2 hours	-40° C	4
II	-110° C	low-alloy steel, e.g. with 3.5% Ni, quenched and tempered	stress-relieved at a temperature of 600 ± 20° C for at least 2 hours	-110° C	5	stress-relieved at a temperature of 600 ± 20° C for at least 2 hours	-110° C	5
III	-200° C	austenitic high-alloy steel (such as Cr-Ni 18/8), quenched, either stabilised, or containing not more than 0.07% carbon	as delivered	-196° C (4)	9	none	-196° C (4)	9 (3)
IV	-270° C	austenitic high-alloy steel (such as Cr-Ni 18/12), quenched, either stabilised, or containing not more than 0.07% carbon	as delivered	-253° C (5) or -196° C (4)	7 10	none	-253° C (5) or -196° C (4)	7 (3) 10 (3)

(1) See marg. 1275-1278.

(2) The values relate to the test-pieces according to VSM 10925 (November, 1950); test-pieces according to DVM (DIN-50115) and Messager yield almost identical values. For test pieces according to ISO R83 (1959), values about 20% lower are to be expected.

(3) See marg. 1279.

(4) Normal boiling temperature of nitrogen.

(5) Normal boiling temperature of hydrogen.

1266

The minimum impact strengths shown apply equally to the sheet, to the seams and to the transition zone (see, however, marg. 1279).

## (b) Receptacles made of aluminium and aluminium alloy

1267

The sheets used for the manufacture of the receptacles, and their welds, should satisfy the following requirements as regards the bending coefficient at ambient temperature:

Thickness of sheet s in mm	Bending coefficient k <sup>(1)</sup> for		
	Sheet	Weld	
		Root in compression zone	Root in tension zone
≤ 12 .....	≥ 25	≥ 15	≥ 12
> 12 to 20 .....	≥ 20	≥ 12	≥ 10
> 20 .....	≥ 15	≥ 9	≥ 8

<sup>(1)</sup> See marg. 1285 and 1286.

(c) *Receptacles made of copper and brass*

- 1268 The sheets used for the manufacture of receptacles, and the receptacles themselves, should have an impact strength equal to or greater than 3 kgm/cm<sup>2</sup> at a temperature of -196° C (see, however, marg. 127).
- 1269 The minimum impact strength shown applies equally to the sheet, to the seams and to the transition zone.
- 1270-  
1274

2. *Tests*(a) *Impact strength tests*

- 1275 The impact strengths shown in marg. 1265 (table) and 1268 relate to test pieces 10 mm × 10 mm with a U-shaped notch of 1 mm radius.

NOTE. 1. For the shape of the test-piece, see footnote 2 to marg. 1265 (table).

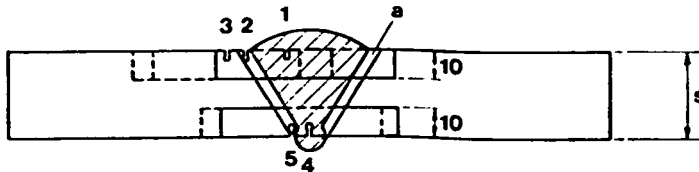
2. For sheets less than 10 mm but at least 7 mm thick, test-pieces with a cross-section of 10 mm × s mm shall be used, where "s" represents the thickness of the sheet. However, such impact-strength tests generally yield higher values than when standard test-pieces are used.

- 1276 (1) In the case of sheets, test-pieces shall be cut both in and at right angles to the direction of rolling.

The notch shall be perpendicular to the surface of the sheet.

(2) Test pieces for the testing of welds shall be cut perpendicularly to the line of the weld, as in the diagram below:

The notches shall be made in the direction of the weld.



1, 2, 3, 4, 5 = Position of the notch on the test-pieces taken from the various zones

a = Zone affected by the heat

s = Thickness of the sheet in mm

- 1277 (1) In the case of sheets, the impact strength shall be determined on three test-pieces in both directions.
- (2) For testing the welds, three test-pieces shall be taken at each of the five points shown in the diagram in marg. 1276 (2).
- 1278 (1) In the case of sheets, the tests in the direction yielding the lowest values shall be decisive. The average of these three tests should satisfy the minimum values shown; none of the individual values should be more than 30 per cent below the minimum shown.
- (2) In the case of welds, the average results obtained from the three test-pieces taken at each of the sampling points should correspond to the minimum values shown. None of the individual values should be more than 30% below the minimum shown.

1279 For austenitic steels of Groups III and IV of marg. 1265 (table), the impact strength of the weld and of the transition zone may be 30% lower than the minimum specified for the unwelded material.

1280-  
1284

(b) *Determination of bending coefficient*

1285 (1) The bending coefficient  $k$  referred to in marg. 1267 is defined as follows:

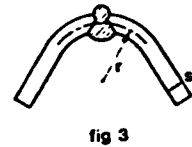
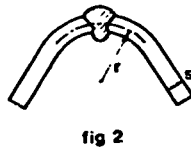
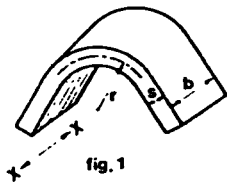
$$k = 50 \frac{s}{r}$$

where  $s$  = thickness of the sheet in mm, and

$r$  = mean radius of curvature in mm of the test-piece at the time when the first crack appears in the tension zone.

(2) The bending coefficient  $k$  shall be determined for both the sheet and the weld. The width  $b$  of the test-piece shall be equal to  $3s$ .

(3) The bending coefficient of the sheet shall be determined at right angles to the direction of rolling (fig. 1). The test of the weld shall be performed on test-pieces with the root in the compression zone (fig. 2) and on test-pieces with the root in the tension zone (fig. 3).



x — x = direction of rolling

1286 Two tests shall be performed on the sheet and four on the weld (two with the root in the compression zone, two with the root in the tension zone); all the results obtained should satisfy the minimum values shown in marg. 1267.

1287-  
1290

C. REGULATIONS RELATING TO TESTS ON AEROSOL DISPENSERS AND NON-REFILLABLE CONTAINERS FOR GASES UNDER PRESSURE OF CLASS I D, ITEMS 16 AND 17

1. *Pressure and bursting tests on receptacle model*

1291 Hydraulic-pressure tests shall be carried out on at least 5 empty receptacles of each model:

- (a) Until the prescribed test pressure is reached, by which time no leakage or visible permanent deformation must occur;
- (b) Until leakage or bursting occurs, the dishing of the bottom, if the latter is concave, first reversing and the receptacle not leaking or bursting until a pressure 1.2 times the test pressure has been reached.

2. *Tightness (leakage) tests on all receptacles*

1292 (1) For the test on aerosol dispensers (item 16) and non-refillable containers of gas under pressure (item 17) in a bath of hot water, the bath temperature and

the duration of the test shall be such that the internal pressure of each receptacle reaches at least 90% of the internal pressure that would be reached at 55° C.

However, if the contents are sensitive to heat or if the receptacles are made of a plastics material which softens at the temperature of this test, the temperature of the bath shall be from 20° to 30° C; one dispenser out of every 2,000 must, in addition, be tested at the temperature prescribed in the preceding paragraph.

(2) No leakage or permanent deformation of receptacles must occur. The provision concerning permanent deformation is not applicable to receptacles made of a plastics material which softens.

1293-  
1299

### APPENDIX III

#### TESTS RELATING TO INFLAMMABLE LIQUIDS OF CLASSES III a AND IV a

1300 (1) The flash-point is determined by means of one of the following types of apparatus:

- (a) For use at temperatures not exceeding 50° C: Abel, Abel-Pensky, Luchaire-Finances, Tag;
- (b) For use at temperatures above 50° C: Pensky-Martens, Luchaire-Finances;
- (c) Failing these, any other closed-cup apparatus capable of giving results within 2° C of those which an apparatus listed above would give at the same place.

(2) To determine the flash-point of paints, gums and similar viscous products containing solvents, only apparatus and test methods suitable for determining the flash-point of viscous liquids may be used, such as method A of IP standard 170/59 or more recent IP standards, German standards DIN 53 213 and TGL 14 301 Leaflet 2.

1301 The test procedure shall be:

- (a) For the Abel apparatus, that of the IP\* standard 33/44; this standard may also be used for the Abel-Pensky apparatus;
- (b) For the Pensky-Martens apparatus, that of the IP\* standard 34/47, or that of A.S.T.M.\*\* standard D.93/46;
- (c) For the Tag apparatus, that of A.S.T.M.\*\* standard D.53/46;
- (d) For the Luchaire apparatus, that of the Instruction annexed to the ministerial order (France) of 26 October 1925 issued by the Ministère du Commerce et de l'Industrie and published in the *Journal Officiel* of 29 October 1925.

If any other apparatus is used, the following precautions must be taken:

1. The test must be performed away from draughts.
2. The rate of temperature increase of the liquid tested must never exceed 5° C per minute.
3. The pilot-flame must be 5 mm ( $\pm$  0.5 mm) long.
4. The pilot-flame must be applied to the opening of the receptacle after each rise of 1° C in the temperature of the liquid.

\* The Institute of Petroleum, 61, New Cavendish Street, London, W.1.

\*\* American Society for Testing and Materials, 1916 Race Street, Philadelphia 3 (Pa).

1302 In the event of a dispute as to the classification of an inflammable liquid, the number proposed by the sender shall be accepted if a check-test yields a result not differing by more than 2° C for the limits of the flash-point, carried out on the liquid in question (21°, 55° and 100° C respectively) stated in marg. 301. If a check-test yields a result differing from these limits by more than 2° C, a second check-test must be carried out, and the highest figure shall be adopted.

1303 The peroxide content of a liquid shall be determined as follows:

A quantity  $p$  (about 5 g, weighed to the nearest cg) of liquid to be titrated shall be placed in an Erlenmeyer flask; 20 cm<sup>3</sup> of acetic anhydride and about 1 g of powdered solid potassium iodide are added; the flask is shaken and, after 10 minutes, heated to about 60° C for 3 minutes; it is then allowed to cool for 5 minutes, after which 25 cm<sup>3</sup> of water are added; after an interval of half an hour, the iodine released is titrated with a decinormal solution of sodium thiosulphate, no indicator being added; complete decolorisation indicates the end of the reaction. If  $n$  is the number of cm<sup>3</sup> of thiosulphate solution required, the percentage of peroxide (calculated as H<sub>2</sub>O<sub>2</sub>) present in the sample is obtained by the formula  $\frac{17n}{100p}$ .

1304-  
1399

#### APPENDIX IV

##### CONDITIONS GOVERNING THE USE OF ELECTRICALLY-FITTED WAGONS

- 1400 Substances and articles of Class I a,  
Articles of Class I b,  
Articles of Class I c, items 4, 21, 22, 23 and 26,  
Substances of items 1, 2 and 3, and acetaldehyde, acetone and acetone mixtures of item 5 of Class III a in packages of more than 50 kg,  
Substances of Class III b, items 3 to 7,  
Substances of Class III c, and  
Substances of Class V, items 2 (a) and 3 (a),  
shall not be carried in electrically-fitted wagons unless the wagons satisfy the following requirements.
- (a) The electric wiring shall be securely fixed and protected against any mechanical damage. Unless lead-covered cable or wiring similar to cable protected by jointless and rustless metal coverings is used, the wiring shall be placed in impermeable steel pipes. Live wires and earthing parts shall be ensured against working loose. The metal parts of the wagon shall be incapable of being used as a return conductor.
  - (b) Lighting shall be provided solely by incandescent electric filament lamps. The point of entry of the leads to the bulbs shall be impermeable, and the bulbs on the loading space side shall be provided with strong firmly sealed protective glass. If the bulbs are not fixed in recesses in the walls or ceiling protecting them against any mechanical damage, they should be encased in a strong protective basket or grill. Incandescent lamps shall be ensured against working loose from their seating.
  - (c) Electrical machinery, regulating equipment, switches and safety appliances (e.g. short-circuit fuse wire, automatic current switches) whose operation may produce sparks, and radiators, heaters and lightning-arresters, shall

be so made as to be unable to cause any explosive mixtures of air and gas, of air and fumes, or of air and dust which might exist in the ambient space (anti-explosion manufacture) to ignite. This requirement shall not apply to electrical installations situated in a compartment which is completely separated from the space reserved for loading by absolutely impermeable walls without communicating doors, and is provided with ventilators communicating with the outside.

1401 (1) Substances and articles of marg. 1400 shall not be loaded in wagons fitted with transformers.

(2) The use of wagons fitted with air-cooled transformers is allowed for substances of Classes III a, III b and III c, and for substances of items 2 (a) and 3 (a) of Class V, as detailed in marg. 1400, if all the constituent raw materials of the transformers are incombustible or not readily inflammable. Air gap transformers must be placed under the body of the wagon and separated from it by an insulator of such nature and size that the electric arc produced if a winding melts cannot set fire to the body.

(3) Wagons fitted with transformers must carry a distinctive sign, unless otherwise recognisable.

1402 Wagons not conforming to these conditions may, however, be used for the carriage of substances and articles referred to above if all electrical installations which do not satisfy the requirements are deprived of current and ensured against being rendered live during carriage.

1403-  
1499

## APPENDIX V

### REGULATIONS RELATING TO TESTS ON STEEL DRUMS FOR THE CARRIAGE OF INFLAMMABLE LIQUIDS OF CLASS III a

#### I. *Pressure tests*

1500 Three drums of each type of construction and from each manufacturer shall be subjected by immersion in water to a pressure test at a gauge pressure of not less than 0.75 kg/cm<sup>2</sup>. The test pressure must remain constant and the drum leak-proof throughout a test period of 10 minutes.

#### II. *Drop test*

1501 The drums shall be filled to 95% of their capacity with water at 20° C and tested by being dropped either onto a non-resilient horizontal steel plate anchored to the floor or onto a horizontal concrete slab. The height of free drop shall be 110 cm. Each receptacle must satisfy the following three tests:

- (a) A drop on an edge of one end of the drum, the longitudinal axis of the drum being inclined and the point of impact being vertically below the centre of gravity. If one of the ends is fitted with a bung, that end shall be tested first. In this case, the point of impact shall be immediately beside the bung;
- (b) A drop as in (a) on that point of the edge of the other end of the drum which is opposite to the point of impact referred to in (a);
- (c) A drop flat on the side of the drum, the line of impact lying in the same plane as the point of impact referred to in (a).

After these tests, all the drums must be leakproof. They are still considered to be leakproof if the interval between the detachment of two successive drops of liquid exceeds five minutes. If one of the three drums tested is not leakproof, six further drums of the same type of construction shall be tested and must pass all the tests prescribed in I and II.

The tests under I and II shall be carried out by an approved body.

### III. *Marking*

- 1502 Drums of tested types of construction shall be durably marked with the impressed or printed symbol of the State\* in which the test was carried out, with the mark "RID, III a", and with a registration number assigned by the body which carried out the tests.

### IV. *Test report*

- 1503 A test report must be drawn up, which shall give the following particulars:
1. The manufacturer of the drum,
  2. A description (e.g. material used, thickness of walls and ends, joints, seams) and a drawing;
  3. The results of the tests;
  4. The mark of the drum.
- A copy of the test report shall be sent to a body designated by the State.

1504-  
1599

\* The relevant symbols are as follows:

A	Austria	GB	Great Britain	PL	Poland
B	Belgium	GR	Greece	R	Romania
BG	Bulgaria	H	Hungary	S	Sweden
CH	Switzerland	I	Italy	SF	Finland
CS	Czechoslovakia	IRQ	Iraq	SYR	Syria
D	Germany†	L	Luxembourg	TN	Tunisia
DK	Denmark	MA	Morocco	TR	Turkey
E	Spain	N	Norway	YU	Yugoslavia
F	France	NL	Netherlands		
FL	Liechtenstein	P	Portugal		

† *Observation of the Central Office:* In accordance with a communication from the competent Authorities of Germany (DB and DR), the symbol "D" is supplemented as follows: in the case of the territory served by DB:  $\frac{"D"}{DB}$ ; in the case of the territory served by DR:  $\frac{"D"}{DR}$ .



## APPENDIX VI

TABLES; METHOD OF APPLYING THE CRITERIA OF NUCLEAR SAFETY CLASS I;  
METHODS OF TESTING PACKAGINGS INTENDED FOR SUBSTANCES OF CLASS IV B

## PART A. TABLES

1600

*Classification of radionuclides for the purposes of carriage*

## Re Introductory Note 2 of Class IV b

NOTE. 1. The asterisk indicates that the radionuclide has been classified in a group in conformity with the table of marg. 1601.

2. For radionuclides which do not appear in this list, see marg. 1601.

Symbol	Radionuclide	Group	Symbol	Radionuclide	Group
Ac	Actinium-227	I	Bi	Bismuth-206	IV
	Actinium-228	I		Bismuth-207	III
Ag	Silver-105	IV		Bismuth-210 (Ra.E)	II
	Silver-110m	III		Bismuth-212	III
	Silver-111	IV	Bk	Berkelium-249	I
Am	Americium-241	I	Br	Bromine-82	IV
	Americium-243	I	C	Carbon-14	IV
Ar	Argon-37	VI	Ca	Calcium-45	IV
	Argon-37 (uncompressed) <sup>(1)</sup>	VI		Calcium-47	IV
	Argon-41	II	Cd	Cadmium-109	III
	Argon-41 (uncompressed) <sup>(1)</sup>	V		Cadmium-115m	III
		Cadmium-115		IV	
As	Arsenic-73	IV	Ce	Cerium-141	IV
	Arsenic-74	IV		Cerium-143	IV
	Arsenic-76	IV		Cerium-144	III
	Arsenic-77	IV	Cf	Californium-249	I
At	Astatine-211	III		Californium-250	I
		Californium-252		I	
Au	Gold-193*	III	Cl	Chlorine-36	III
	Gold-194*	III		Chlorine-38	IV
	Gold-195*	III	Cm	Curium-242	I
	Gold-196	IV		Curium-243	I
	Gold-198	IV		Curium-244	I
	Gold-199	IV		Curium-245	I
		Curium-246		I	
Ba	Barium-131	IV	Co	Cobalt-56*	III
	Barium-140	III		Cobalt-57	IV
Be	Beryllium-7	IV		Cobalt-58m	IV
				Cobalt-58	IV
				Cobalt-60	III
<sup>(1)</sup> <i>Uncompressed</i> means: whose absolute pressure referred to a temperature of 0° C does not exceed one atmosphere (i.e., the mean pressure of the atmosphere at a latitude of 45° and at mean sea level).			Cr	Chromium-51	IV

Symbol	Radionuclide	Group
Cs	Caesium-131	III
	Caesium-134m	IV
	Caesium-134	III
	Caesium-135	IV
	Caesium-136	IV
	Caesium-137	IV
Cu	Copper-64	IV
Dy	Dysprosium-154*	III
	Dysprosium-165	IV
	Dysprosium-166	IV
Er	Erbium-169	IV
	Erbium-171	IV
Eu	Europium-150*	III
	Europium-152(A) (9.2 hrs)	IV
	Europium-152(B) (12.7 yrs)	III
	Europium-154	II
	Europium-155	IV
F	Fluorine-18	IV
Fe	Iron-55	IV
	Iron-59	IV
Ga	Gallium-67*	III
	Gallium-72	IV
Gd	Gadolinium-153	IV
	Gadolinium-159	IV
Ge	Germanium-71	IV
H	Hydrogen-3— <i>see T-Tritium</i>	
Hf	Hafnium-181	IV
Hg	Mercury-197m	IV
	Mercury-197	IV
	Mercury-203	IV
Ho	Holmium-166	IV
I	Iodine-124*	III
	Iodine-125*	III
	Iodine-126	III
	Iodine-129	III
	Iodine-131	III
	Iodine-132	IV
	Iodine-133	III
	Iodine-134	IV
Iodine-135	IV	

Symbol	Radionuclide	Group
In	Indium-113m	IV
	Indium-114m	III
	Indium-115m	IV
Ir	Iridium-190	IV
	Iridium-192	III
	Iridium-194	IV
K	Potassium-42	IV
	Potassium-43*	III
Kr	Krypton-85m	III
	Krypton-85m (uncompressed) <sup>(1)</sup>	V
	Krypton-85	III
	Krypton-85 (uncompressed) <sup>(1)</sup>	VI
	Krypton-87	II
	Krypton-87 (uncompressed) <sup>(1)</sup>	V
La	Lanthanum-140	IV
Lu	Lutecium-172*	III
	Lutecium-177	IV
M.f.p.	Mixed fission products	II
Mg	Magnesium-28*	III
Mn	Manganese-52	IV
	Manganese-54	IV
	Manganese-56	IV
Mo	Molybdenum-99	IV
Na	Sodium-22	III
	Sodium-24	IV
Nb	Niobium-93m	IV
	Niobium-95	IV
	Niobium-97	IV
Nd	Neodymium-147	IV
	Neodymium-149	IV
Ni	Nickel-56*	III
	Nickel-59	IV
	Nickel-63	IV
	Nickel-65	IV
Np	Neptunium-237	I
	Neptunium-239	I

<sup>(1)</sup> *Uncompressed* means: whose absolute pressure referred to a temperature of 0° C does not exceed one atmosphere (i.e., the mean pressure of the atmosphere at a latitude of 45° and at mean sea level).

Symbol	Radionuclide	Group
Os	Osmium-185	IV
	Osmium-191m	IV
	Osmium-191	IV
	Osmium-193	IV
P	Phosphorus-32	IV
Pa	Protactinium-230	I
	Protactinium-231	I
	Protactinium-233	II
Pb	Lead-203	IV
	Lead-210	II
	Lead-212	II
Pd	Palladium-103	IV
	Palladium-109	IV
Pm	Promethium-147	IV
	Promethium-149	IV
Po	Polonium-210	I
Pr	Praseodymium-142	IV
	Praseodymium-143	IV
Pt	Platinum-191	IV
	Platinum-193m	IV
	Platinum-197m	IV
	Platinum-197	IV
Pu	Plutonium-238	I
	Plutonium-239	I
	Plutonium-240	I
	Plutonium-241	I
	Plutonium-242	I
Ra	Radium-223	II
	Radium-224	II
	Radium-226	I
	Radium-228	I
Rb	Rubidium-86	IV
	Rubidium-87	IV
	Rubidium natural	IV
Re	Rhenium-183	IV
	Rhenium-186	IV
	Rhenium-187	IV
	Rhenium-188	IV
	Rhenium natural	IV
Rh	Rhodium-103m	IV
	Rhodium-105	IV
Rn	Radon-220	IV
	Radon-222	II

Symbol	Radionuclide	Group
Ru	Ruthenium-97	IV
	Ruthenium-103	IV
	Ruthenium-105	IV
	Ruthenium-106	III
S	Sulphur-35	IV
Sb	Antimony-122	IV
	Antimony-124	III
	Antimony-125	III
Sc	Scandium-46	III
	Scandium-47	IV
	Scandium-48	IV
Se	Selenium-75	IV
Si	Silicon-31	IV
Sm	Samarium-145*	III
	Samarium-147	III
	Samarium-151	IV
	Samarium-153	IV
Sn	Tin-113	IV
	Tin-117m*	III
	Tin-121*	III
	Tin-125	IV
Sr	Strontium-85m	IV
	Strontium-85	IV
	Strontium-89	III
	Strontium-90	II
	Strontium-91	III
Strontium-92	IV	
T	Tritium (in a form other than those below)	IV
	Tritium (in the form of T <sub>2</sub> or HT)	VII
	Tritium (activated luminous paint or tritium gas adsorbed on a solid carrier)	VIII
Ta	Tantalum-182	III
Tb	Terbium-160	III
Tc	Technetium-96m	IV
	Technetium-96	IV
	Technetium-97m	IV
	Technetium-97	IV
	Technetium-99m	IV
	Technetium-99	IV

Symbol	Radionuclide	Group	Symbol	Radionuclide	Group	
Te	Tellurium-125m	IV	W	Tungsten-181	IV	
	Tellurium-127m	IV		Tungsten-185	IV	
	Tellurium-127	IV		Tungsten-187	IV	
	Tellurium-129m	III	Xe	Xenon-125	III	
	Tellurium-129	IV		Xenon-125* (uncompressed) <sup>(1)</sup>	III	
	Tellurium-131m	III		Xenon-131m	III	
	Tellurium-132	IV		Xenon-131m (uncompressed) <sup>(1)</sup>	V	
Th	Thorium-227	II		Xenon-133	III	
	Thorium-228	I		Xenon-133 (uncompressed) <sup>(1)</sup>	VI	
	Thorium-230	I		Xenon-135	II	
	Thorium-231	I	Xenon-135 (uncompressed) <sup>(1)</sup>	V		
	Thorium-232	III	Y	Yttrium-88*	III	
	Thorium-234	II		Yttrium-90	IV	
	Thorium natural	III		Yttrium-91m	III	
Tl	Thallium-200	IV		Yttrium-91	III	
	Thallium-201	IV		Yttrium-92	IV	
	Thallium-202	IV		Yttrium-93	IV	
	Thallium-204	III		Yb	Ytterbium-175	IV
Tm	Thulium-168*	III	Zn		Zinc-65	IV
	Thulium-170	III			Zinc-69m	IV
	Thulium-171	IV		Zinc-69	IV	
	U	Uranium-230	II	Zr	Zirconium-93	IV
Uranium-232		I	Zirconium-95		III	
Uranium-233		II	Zirconium-97		IV	
Uranium-234		II	<sup>(1)</sup> <i>Uncompressed</i> means: whose absolute pressure referred to a temperature of 0° C does not exceed one atmosphere (i.e., the mean pressure of the atmosphere at a latitude of 45° and at mean sea level).			
Uranium-235		III	V	Vanadium-48	IV	
Uranium-236		II		Vanadium-49*	III	
Uranium-238		III				
Uranium natural		III				

1601

*Formula for the classification for carriage of radionuclides  
not listed in marg. 1600*

Re Introductory Note 3 to class IV b

Radionuclide	Physical half-life		
	0 to 1,000 days	More than 1,000 days to 10 <sup>6</sup> years	More than 10 <sup>6</sup> years
Atomic number 1 to 81 .....	Group III	Group II	Group III
Atomic number 82 and over.....	Group I	Group I	Group III

1602

*Mass-activity ratios for natural thorium and uranium  
for purposes of carriage*

Re Introductory Note 5 to class IV b

Radioactive substance	Curies per gram	Grams per curie
Natural thorium .....	$1.11 \times 10^{-7}$	$9 \times 10^6$
Uranium (according to percentage by weight below of U-235)		
0.45 .....	$5.0 \times 10^{-7}$	$2.0 \times 10^6$
0.72 (natural) .....	$7.06 \times 10^{-7}$	$1.42 \times 10^6$
1.0 .....	$7.6 \times 10^{-7}$	$1.3 \times 10^6$
1.5 .....	$1.0 \times 10^{-6}$	$1.0 \times 10^6$
5.0 .....	$2.7 \times 10^{-6}$	$3.7 \times 10^5$
10.0 .....	$4.8 \times 10^{-6}$	$2.1 \times 10^5$
20.0 .....	$1.0 \times 10^{-5}$	$1.0 \times 10^5$
35.0 .....	$2.0 \times 10^{-5}$	$5.0 \times 10^4$
50.0 .....	$2.5 \times 10^{-5}$	$4.0 \times 10^4$
90.0 .....	$5.8 \times 10^{-5}$	$1.7 \times 10^4$
93.0 .....	$7.0 \times 10^{-5}$	$1.4 \times 10^4$
95.0 .....	$9.1 \times 10^{-5}$	$1.1 \times 10^4$

1603

*Neutron flux to be regarded for purposes of carriage  
as equivalent to a dose rate of 1 mR/h*

Re marg. 453 (2), note

Neutron energy	Flux density (neutrons/cm <sup>2</sup> /sec)
Thermal .....	268
5 keV .....	228
20 keV .....	112
100 keV .....	32
500 keV .....	12
1 MeV .....	7.2
5 MeV .....	7.2
10 MeV .....	6.8

NOTE. The flux values for energies intermediate between those listed above are to be obtained by linear interpolation.

1604

*Maximum permissible levels of radioactive contamination*

Re marg. 451a 1. (b), marg. 452 (4) (i), 462 (4),  
463 (4), 464 (9) and 465 (3) (e)

Emitter	Maximum permissible level
Beta or gamma emitters .....	$10^{-4}$ $\mu\text{Ci}/\text{cm}^2$
Alpha emitters.....	$10^{-5}$ $\mu\text{Ci}/\text{cm}^2$

NOTE. The above levels constitute the mean permissible levels for any area 300 cm<sup>2</sup> of the surface considered.

1605

*Safety distances for the loading and storage of packages bearing a label with the word FOTO together with packages of Category II-YELLOW or category III-YELLOW*

Re marg. 462 (3) and 470 (3)

Total of packages of category		Total of transport indices	Duration of carriage in hours							
III-YELLOW	II-YELLOW		1	2	4	10	24	48	120	240
			Minimum distances in metres							
		0.2	0.3	0.3	0.3	0.5	1	1	2	3
	1	0.5	0.3	0.3	0.5	1	1	2	3	4
	2	1	0.3	0.5	1	1	2	3	4	5
	4	2	0.5	1	1	2	3	3	5	7
	8	4	1	1	2	2	3	5	7	10
1	20	10	1	2	2	4	5	7	11	16
2	40	20	2	2	3	5	7	10	16	22
3	60	30	2	3	4	6	9	12	19	27
4	80	40	2	3	4	7	10	14	22	31
5	100	50	3	4	5	7	11	16	25	35

1606-

1620

*PART B**Method of applying the criteria of Nuclear Safety Class I*

Re marg. 456 (7)

1621 *Method of calculation*

(a) Every package must comply with the criteria set out in marg. 456 (7);

(b) Every package, whether damaged or not, must be so designed that the fissile substances it contains are protected against thermal neutrons;

(c) If a parallel beam of neutrons having the energy spectrum specified in the table below strikes an undamaged package at any angle, the multiplication factor for epithermal neutrons at the surface, i.e. the ratio of the number of epithermal neutrons emitted by the package to the number of epithermal neutrons penetrating into the package, must be less than one, and the spectrum of the neutrons emitted by the package—which is assumed to be one of an infinite array of such packages—must not be harder than that of the incident neutrons;

(d) Conformity with the standards set out in marg. 456 (7) (b) 2 must be demonstrated.

*Neutron energy spectrum\* to be used*

Neutron energy E	Percentage of neutrons with energy less than E
11 MeV .....	100
2.4 MeV .....	80.2
1.1 MeV .....	59
0.55 MeV .....	46
0.26 MeV .....	37.3
0.13 MeV .....	31.9
43 keV .....	26.3
10 keV .....	21
1.6 keV .....	15.6
0.26 keV .....	11.1
42 eV .....	7.2
5.5 eV .....	3.6
0.4 eV .....	0

\* This spectrum corresponds to the epithermal portion of the spectrum in a state of equilibrium, emitted by a package having a wooden shield 5 cm thick, in a critical array of such packages.

**1622** *Physical model*

(1) Description of packagings:

(a) The packaging is so made that the fissile substance is surrounded by a layer of material capable of absorbing all thermal neutrons incident on it\* and that this neutron-absorbing layer is itself surrounded by a thickness of not less than 10.2 cm of wood having a hydrogen content of not less than 6.5 per cent by weight, the smallest external dimension of this wooden casing being not less than 30.5 cm.

(b) The packaging is so made that in the conditions resulting from the tests prescribed in marg. 1642 to 1646 and 1648 to 1651 of this Appendix the fissile content will remain surrounded by the neutron-absorbing layer, this neutron absorber will remain surrounded by wood, and the wood will not be affected to

\* This layer may be a casing of cadmium not less than 0.38 mm thick, equivalent to 0.325 g Cd per cm<sup>2</sup>.

such an extent as to reduce the thickness remaining to be less than 9.2 cm or the smallest external dimension of the remaining to less than 28.5 cm.

(2) Permissible content:

This content must not exceed the permissible masses of fissile substance, indicated in tables I to X below, consistent with

The nature of the substance;

The maximum moderation; and

The greatest diameter (or volume)

which would result from subjecting the packaging to conditions corresponding to the tests referred to under (1) (b) above.

NOTE. A detailed calculation for a given packaging, carried out by the method described in marg. 1621, may yield less restrictive values.



Table I. *Aqueous solutions of plutonium nitrate*  
Permissible mass of plutonium nitrate per package according to packaging wood density

I.1. Limited by maximum internal diameter of inner receptacle														
Inner receptacle diameter not exceeding (cm)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than													
	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25
kg Pu(NO <sub>3</sub> ) <sub>4</sub> per package														
10.16	←				No limit				→					
No limit	0.044	0.108	0.171	0.232	0.291	0.348	0.40	0.46	0.51	0.55	0.59	0.63	0.66	0.69
I.2. Limited by maximum internal volume of inner receptacle														
Inner receptacle volume not exceeding (litres)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than													
	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25
kg Pu(NO <sub>3</sub> ) <sub>4</sub> per package														
2	0.310	0.61	1.06	1.64	2.37	3.24	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2
3	0.096	0.271	0.50	0.77	1.42	1.55	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2
4	0.044	0.155	0.193	0.271	1.42	1.42	1.42	1.42	1.42	1.82	2.44	3.17	4.04	5.03
5	0.044	0.108	0.173	0.240	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42
7	0.044	0.108	0.171	0.232	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42
No limit	0.044	0.108	0.171	0.232	0.291	0.348	0.40	0.46	0.51	0.55	0.59	0.63	0.66	0.69

Table II. *Aqueous solutions of uranyl\* fluoride or uranyl\* nitrate*  
Permissible mass of uranium per package according to packaging wood density

II.1. Limited by maximum internal diameter of inner receptacle														
Inner receptacle diameter not exceeding (cm)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than													
	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25
kg uranium per package														
10.16	No limit													
No limit	0.084	0.120	0.157	0.193	0.231	0.267	0.301	0.335	0.370	0.400	0.429	0.456	0.478	0.498
II 2. Limited by maximum internal volume of inner receptacle														
Inner receptacle volume not exceeding (litres)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than													
	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25
kg uranium per package														
2	0.152	0.380	0.66	1.01	1.47	2.00	2.66	3.50	4.64	6.04	7.62	9.39	11.3	13.3
3	0.084	0.223	0.416	0.65	0.93	1.25	1.58	1.96	2.34	2.74	3.16	3.57	3.99	4.42
4	0.084	0.120	0.157	0.193	0.231	0.274	0.356	0.498	0.73	1.05	1.47	2.02	2.70	3.55
5	0.084	0.120	0.157	0.193	0.231	0.267	0.301	0.495	0.57	0.66	0.74	0.84	0.92	1.02
7	0.084	0.120	0.157	0.193	0.231	0.267	0.301	0.347	0.406	0.467	0.53	0.60	0.66	0.73
No limit	0.084	0.120	0.157	0.193	0.231	0.267	0.301	0.335	0.370	0.400	0.429	0.456	0.478	0.498

\* Uranium containing no U<sup>233</sup> and not more than 93.5 per cent by weight U<sup>235</sup>.

Table III. *Non-hydrogenous uranium\* compounds or mixtures whose uranium-235 concentration does not exceed 4.8 g/cm<sup>3</sup>\*\**

(Including unmoderated uranium metal of uranium-235 enrichment not exceeding 25 per cent by weight)  
Permissible mass of uranium per package according to packaging wood density

III.1. Limited by maximum internal diameter of inner receptacle	
Inner receptacle diameter not exceeding (cm)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than 0.6 g/cm <sup>3</sup>
10.16 No limit	kg uranium per package No limit 0.69
III.2. Limited by maximum internal volume of inner receptacle	
Inner receptacle volume not exceeding (litres)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than 0.65
3	0.7
4	0.75
5	0.8
7	0.85
No limit	No limit 0.69
kg uranium per package	
3	7.0
4	10.0
5	12.2
7	14.5
No limit	14.5

\* Uranium containing no U<sup>233</sup> and not more than 93.5 per cent by weight U<sup>235</sup>.

\*\* Mixtures containing beryllium or deuterium are excluded, and the mass of carbon must not exceed five times the permissible mass of uranium.

Table IV. *Non-hydrogenous uranium\* compounds or mixtures whose uranium-235 concentration does not exceed 9.6 g/cm<sup>3</sup>\*\**

(Including unmoderated uranium metal of uranium-235 enrichment not exceeding 50 per cent by weight)  
Permissible mass of uranium per package according to packaging wood density

IV.1. Limited by maximum internal diameter of inner receptacle	
Inner receptacle diameter not exceeding (cm)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than
	0.6 0.65 0.7 0.75 0.8 0.85 0.9 0.95 1.0 1.05 1.1 1.15 1.2 1.25
	kg uranium per package
7.5	← No limit
8	← No limit
8.5	← No limit
9	← No limit
9.5	← No limit
10	← No limit
No limit	← No limit
	kg uranium per package
	6 7 8 9.2 10 11 12 14 15 16 17 17 17 19
	0.69 0.69 0.69 0.69 0.69 0.69 0.69 0.69 0.69 0.69 0.69 0.69 0.69 0.69
	No limit No limit No limit No limit No limit No limit No limit No limit No limit No limit No limit No limit No limit
IV.2. Limited by maximum internal volume of inner receptacle	
Inner receptacle volume not exceeding (litre)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than
	0.65 0.7 0.75 0.8 0.85 0.9 0.95 1.0
	kg uranium per package
3	7 8 9.2 10 11 12 14 14.5
4	4.8 7.8 7.8 7.8 7.8 7.8 7.8 7.8
5	3.63 3.63 3.63 3.63 3.63 3.63 3.63 3.63
7	1.41 1.41 1.41 1.41 1.41 1.41 1.41 1.41
No limit	0.69 0.69 0.69 0.69 0.69 0.69 0.69 0.69

\* Uranium containing no U<sup>233</sup> and not more than 93.5 per cent by weight U<sup>235</sup>.

\*\* Mixtures containing beryllium or deuterium are excluded, and the mass of carbon must not exceed five times the permissible mass of uranium.

Table V. *Unmoderated uranium\* metal*  
Permissible mass of uranium per package according to packaging wood density

V.1. Limited by maximum internal diameter of inner receptacle														
Inner receptacle diameter not exceeding (cm)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than													
	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25
kg uranium per package														
6	7	7	8	9.2	10	11	12	14	14	15	16	No limit	No limit	No limit
6.5	7	7	8	9.2	10	11	12	14	14	15	16	17	17	19
7	7	7	8	9.2	10	11	12	14	14	15	16	17	17	19
7.5	6	7	8	9.2	10	11	12	14	14	15	16	17	17	19
10	6	7	8	9.2	10	11	12	14	14	15	16	17	17	19
No limit	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
No limit**	6	7	8	9.2	10	11	12	14	14	15	16	17	17	19

V.2. Limited by maximum internal volume of inner receptacle														
Inner receptacle volume not exceeding (litres)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than													
	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25
kg uranium per package														
2	6	7	8	9.2	10	11	12	14	14	15	16	17	17	19
3	6	7	8	9.2	10	11	12	14	14	14.5	14.5	14.5	14.5	14.5
4	6	7	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
5	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63	3.63
7	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41
No limit	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
No limit**	6	7	8	9.2	10	11	12	14	14	15	16	17	17	19

\* Uranium containing no U<sup>233</sup> and not more than 93.5 per cent by weight U<sup>235</sup>.

\*\* These larger masses are permissible where the fissile material is in the form of massive metal pieces weighing not less than 2 kg each and free from re-entrant surfaces.

Table VI. Uranium\* compounds or mixtures whose uranium concentration does not exceed  $\frac{26.44}{H/U + 1.41} \text{ g/cm}^3$   
Permissible mass of uranium per package according to packaging wood density

VI.1. Limited by maximum internal diameter of inner receptacle														
Inner receptacle diameter not exceeding (cm)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than													
	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25
	kg uranium per package													
6	2.80	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
6.5	2.80	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
7	2.80	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
7.5	0.330	0.87	1.10	1.80	2.50	3.50	4.6	7.1	7.7	9.6	11.6	13.8	16.1	18.3
10	0.084	0.120	0.157	0.193	0.231	0.267	0.301	0.335	0.370	0.400	0.429	0.456	0.478	0.498
No limit														
VI.2. Limited by maximum internal volume of inner receptacle														
Inner receptacle volume not exceeding (litres)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than													
	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25
	kg uranium per package													
2	0.152	0.380	0.66	1.01	1.47	2.00	2.66	3.50	4.64	6.04	7.62	9.39	11.3	13.3
3	0.084	0.223	0.416	0.65	0.93	1.25	1.58	1.96	2.34	2.74	3.16	3.57	3.99	4.42
4	0.084	0.120	0.157	0.193	0.231	0.274	0.356	0.498	0.73	1.05	1.47	2.02	2.70	3.55
5	0.084	0.120	0.157	0.193	0.231	0.267	0.301	0.495	0.57	0.66	0.74	0.84	0.92	1.02
7	0.084	0.120	0.157	0.193	0.231	0.267	0.301	0.347	0.406	0.467	0.53	0.60	0.66	0.73
No limit	0.084	0.120	0.157	0.193	0.231	0.267	0.301	0.335	0.370	0.400	0.429	0.456	0.478	0.498

\* Uranium containing no U<sup>233</sup> and not more than 93.5 per cent by weight U<sup>235</sup>.

Table VII. *Non-hydrogenous plutonium compounds or mixtures whose plutonium-239 concentration does not exceed 10 g/cm<sup>3</sup>\**

Permissible mass of plutonium per package according to packaging wood density

VII.1. Limited by maximum internal diameter of inner receptacle											
Inner receptacle diameter not exceeding (cm)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than		0.95		1.05		1.1		1.15		
	0.6	0.65	0.7	0.75	0.8						
kg plutonium per package											
6	3.60	4.2	4.2	4.7	5.3	5.3	5.9	7.1	8.1	8.3	8.6
6.5	3.60	4.2	4.7	5.3	5.3	5.9	7.1	8.1	8.3	8.6	8.9
7	3.60	4.2	4.7	5.3	5.3	5.9	7.1	8.1	8.3	8.6	8.9
7.5	3.60	4.2	4.7	5.3	5.3	5.9	7.1	8.1	8.3	8.6	8.9
10	3.60	4.2	4.7	5.3	5.3	5.9	7.1	8.1	8.3	8.6	8.9
No limit	0.405	0.405	0.405	0.405	0.405	0.405	0.405	0.405	0.405	0.405	0.405
No limit											
VII.2. Limited by maximum internal volume of inner receptacle											
Inner receptacle volume not exceeding (litre <sup>v</sup> )	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than		0.7		0.75		0.8				
	0.6	0.65	0.7	0.75	0.8						
kg plutonium per package											
3	3.60	4.2	4.2	4.7	5.3	5.3	5.9	7.1	8.1	8.3	8.6
4	3.60	4.2	4.7	5.3	5.3	5.9	7.1	8.1	8.3	8.6	8.9
5	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44
7	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
No limit	0.405	0.405	0.405	0.405	0.405	0.405	0.405	0.405	0.405	0.405	0.405

\* Mixtures containing beryllium and deuterium are excluded, and the mass of carbon must exceed 1/10 of the permissible mass of plutonium.

Table VIII. *Unmoderated plutonium metal*  
Permissible mass of plutonium per package according to packaging wood density

VIII.1. Limited by maximum internal diameter of inner receptacle		Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than	
Inner receptacle diameter not exceeding (cm)	0.6	0.65	0.7
	kg plutonium per package		
4	3.20	3.60	No limit
10	3.20	3.60	3.90
No limit	0.405	0.405	0.405
No limit*	3.20	3.60	3.90
			4.2
			4.4
			0.405
			4.4
			4.5
			0.405
			4.5
			0.85

VIII.2. Limited by maximum internal volume of inner receptacle		Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than	
Inner receptacle volume not exceeding (litres)	0.6	0.65	0.7
	kg plutonium per package		
3	3.20	3.60	3.90
4	3.20	3.60	3.84
5	2.44	2.44	2.44
7	1.20	1.20	1.20
No limit	0.405	0.405	0.405
No limit*	3.20	3.60	3.90
			4.2
			4.4
			3.84
			2.44
			1.20
			0.405
			4.2
			0.85

\* These larger masses are permissible where the fissile material is in the form of massive metal pieces weighing not less than 2 kg each and free from re-entrant surfaces.



Table IX. *Plutonium compounds or mixtures whose plutonium concentration does not exceed  $\frac{26.56}{HIPu + 1.35}$  g/cm<sup>3</sup>*  
Permissible mass of plutonium per package according to packaging wood density

IX.1. Limited by maximum internal diameter of inner receptacle															
Inner receptacle diameter not exceeding (cm)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than														
	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25	
kg plutonium per package															
4	←	3.2	3.60	3.90	4.2	4.4	←	No limit					←	4.5	4.5
5	←	2.80	3.60	3.90	4.2	4.4	←	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
6	←	2.50	3.40	3.80	4.2	4.4	←	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
6.5	←	2.20	3.10	3.70	4.2	4.4	←	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
7	←	1.90	2.70	3.40	4.1	4.4	←	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
7.5	←	1.60	2.30	3.0	3.80	4.4	←	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
8	←	1.30	1.80	2.40	3.20	3.80	4.3	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
8.5	←	0.97	1.30	1.80	2.40	3.00	3.40	3.60	3.80	4.0	4.2	4.4	4.4	4.4	4.4
9	←	0.65	0.88	1.20	1.50	1.90	2.20	2.40	2.60	2.80	3.10	3.60	4.4	4.4	4.4
9.5	←	0.330	0.42	0.50	0.58	0.70	0.83	0.99	1.20	1.50	1.90	2.70	3.90	4.5	4.5
10	←	0.022	0.053	0.084	0.114	0.143	0.171	0.199	0.226	0.250	0.274	0.294	0.311	0.327	0.339
No limit	←														
IX.2. Limited by maximum internal volume of inner receptacle															
Inner receptacle volume not exceeding (litres)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than														
	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25	
kg plutonium per package															
2	0.152	0.309	0.52	0.80	1.16	1.59	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
3	0.047	0.133	0.247	0.380	0.700	0.76	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
4	0.022	0.076	0.095	0.133	0.700	0.700	0.700	0.700	0.700	0.89	1.19	1.55	1.98	2.47	
5	0.022	0.053	0.085	0.118	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	
7	0.022	0.053	0.084	0.114	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	
No limit	0.022	0.053	0.084	0.114	0.143	0.171	0.199	0.226	0.250	0.274	0.294	0.311	0.327	0.339	

Table X. *Aqueous solutions of uranium-233 nitrate or uranium-233 fluoride*  
Permissible mass of uranium per package according to packaging wood density

X.1. Limited by maximum internal diameter of inner receptacle															
Inner receptacle diameter not exceeding (cm)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than														
	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25	
kg uranium per package															
9	No limit														
9.5	0.035	0.067	←	No limit										↑	
10	0.035	0.067	0.100	←	No limit										↑
No limit	0.035	0.067	0.100	0.134	0.169	0.200	0.231	0.261	0.289	0.316	0.340	0.361	0.371	0.391	
X.2. Limited by maximum internal volume of inner receptacle															
Inner receptacle volume not exceeding (litres)	Wood density not exceeding 1.25 g/cm <sup>3</sup> and not less than														
	0.6	0.65	0.7	0.75	0.8	0.85	0.9	0.95	1.0	1.05	1.1	1.15	1.2	1.25	
kg uranium per package															
2	0.152	0.309	0.475	0.71	0.99	1.33	1.71	2.11	2.54	2.99	3.44	3.94	4.41	4.8	
3	0.085	0.133	0.180	0.228	0.285	0.332	0.389	0.446	0.50	0.56	0.60	0.67	0.73	0.78	
4	0.085	0.109	0.133	0.175	0.213	0.266	0.304	0.356	0.408	0.460	0.51	0.57	0.63	0.69	
5	0.035	0.076	0.114	0.152	0.190	0.223	0.256	0.292	0.323	0.356	0.389	0.422	0.451	0.484	
7	0.035	0.073	0.109	0.142	0.175	0.204	0.235	0.263	0.289	0.318	0.342	0.368	0.394	0.420	
No limit	0.035	0.067	0.100	0.134	0.169	0.200	0.231	0.261	0.289	0.316	0.340	0.361	0.377	0.391	

1623-  
1640

## PART C. TEST METHODS

## I. Packaging

*General*

1641

(1) The tests must be carried out on samples or prototypes of packaging of the design in question. However, proof that the packaging design satisfies the required conditions may also be furnished by calculations or by any other pertinent method.

(2) Number of samples or prototypes to be tested:

In the interest of both economy and safety, the number of packaging samples or prototypes to be tested will depend on the number of packagings of the type concerned which are to be produced and used, on the frequency of their use, and on the unit cost of very costly packagings. For samples and prototypes of a packaging design which are required to be tested, a programme of the tests must be drawn up showing the tests actually to be performed, their sequence, and the number of samples or prototypes required. The results of the tests may necessitate an increase in that number to meet the requirements of the methods with regard to maximum damage.

(3) Preparation of a packaging sample or prototype for tests:

(a) Before being tested, every packaging must be examined for the purpose of identifying and noting defects or damage, and more particularly:

1. Non-conformity with specifications or drawings;
2. Defects of construction;
3. Corrosion or other deterioration;
4. Distortion of components.

(b) The packaging must be freed from any dirt and moisture.

(c) The packaging must be an exact replica of the one which is to be used for carriage; it must, in particular, include all attachments, casings, frames and other external accessories. The contents of the sample package must simulate as closely as possible the radioactive substance to be carried. The effects of spontaneous heating through radioactive disintegration may be assessed separately, but must be taken into account in evaluating the results of both the free-fall test and the thermal test. The contents may include a suitable radioactive substance. The weight of the sample package tested must be the same as that of a real package (packaging plus contents)

(d) The containment vessel must be clearly identifiable.

(e) The external parts of the packaging must be clearly identified so that any point on them can be easily and unambiguously referred to.

(4) Verification of soundness of containment vessel and shield:

After the sample package has been subjected to any one of the tests prescribed in marg. 1642 to 1651, it must still be shown that containment and shielding have been preserved to the extent required for the type of packaging considered. One means of doing so consists in verifying containment and shielding by the methods described in marg. 1652.

*Methods prescribed for the tests referred to in marg. 452 (3) (i), (5) (a) and (6) (a); 455 (1) (b), (3), (4) (a) and (d), (6) (b) and (c); 456 (6), (7) (a) 1. and (b) 2.; (9), (10) (a) and (b) 2.; and 1622 (1) (b)*

**1642** The sample package must be subjected to each of the tests referred to below from which it is not expressly exempted. A sample must be subjected successively to at least two of the tests from which the package design is not expressly exempted.

*Water-spray test followed by free fall*

**1643** (1) Exemptions:

Packagings whose outer casing is made entirely of metal, wood, ceramic or a plastics material, or of any combination of these materials, are exempted from this test.

(2) Method:

(a) (i) The sample package, standing on its base on a level surface, is sprayed with water from four directions successively, as described in (d) below, for 30 minutes in each direction, the changes of direction being effected as quickly as possible; or

(ii) The sample package, standing on its base on a level surface, is sprayed from the four directions simultaneously, as described in (d) below, for not less than 30 minutes;

(b) The undried sample package is subjected to the free-fall test from a height of 1.20 m specified in marg. 1644, immediately after spraying if the method described in (a) (i) above has been used, or after an interval of 1 h 30 min to 2 h 30 min if the method described in (a) (ii) above has been used;

(c) The water must be sprayed\* at a pressure of  $2 \pm 0.3$  kg/cm<sup>2</sup> in conformity with the following provisions:

(i) The jet of water must be in the shape of a solid cone with a vertex angle of 35° measured at the nozzle outlet;

(ii) The delivery of each jet must be  $230 \pm 23$  litres per hour;

(iii) More than 50% of the drops of water must be 3 to 5 mm in diameter;

(d) The jet must be directed downwards onto the sample package from a distance of 2.40 m (measured from the nozzle to a corner or edge of the package) at an angle of 45° to the horizontal, the axis of the jet being in a vertical plane defined as follows:

(i) In the case of rectangular sample packages, the plane of the diagonal connecting the corner aimed at with the opposite corner;

(ii) Cylindrical sample packages must stand on one of their plane faces and the jet must be directed from four directions successively, each at right angles to the next preceding and/or following.

The water must be able to drain away continuously; in other words, the package must not stand in a pool of water.

*Free-fall test*

**1644** (1) Exemptions:

Cylinders to hold compressed gases at a pressure exceeding 7 kg/cm<sup>2</sup> are exempted from this test.

\* To satisfy the requirements of this test, it is permissible to use, for example, a rose nozzle whose outlet consists of a flat non-rustable metal plate 1.6 mm thick, pierced by 36 holes of 1 mm diameter evenly spaced in concentric circles in the following manner:

16 holes in a circumference of 25 mm radius  
8 holes in a circumference of 19 mm radius  
8 holes in a circumference of 13 mm radius  
4 holes in a circumference of 6 mm radius.

## (2) Method:

(a) The sample package is dropped onto the target in such a way as to sustain the greatest possible damage with respect to the safety factors to be verified;

(b) The height of fall, measured from the lowest point of the sample package to the surface of the target, must be 1.20 m;

(c) In addition, in the case of rectangular sample packagings made of paper-board or wood and weighing not more than 50 kg, a separate sample must be subjected to a free-fall test from a height of 30 cm on to each of its corners;

(d) In addition, in the case of cylindrical sample packages made of paper-board and weighing not more than 100 kg, a separate sample must be subjected to a free-fall test from a height of 30 cm on to each quarter of each of the circular rims;

(e) In the case of packages of Nuclear Safety Class II, the sample package to be tested as prescribed in (b) must, before the test, be subjected to a free-fall test from a height of 30 cm on to each of its corners or, if the sample package is cylindrical, on to each quarter of each of the circular rims.

## (3) Target:

The target on which the packaging falls must have a rigid, smooth, flat and horizontal surface. It may consist, for example, of the upper surface of a block of a material of sufficient mass to absorb the impacts without appreciable movement. The surface of the target may be covered by a protective steel plate.

*Compression test*

## Method:

1645

The sample package must be subjected for not less than 24 hours to a compressive force equal to the greater of the following two values: five times its weight, or the product of 1,300 kg/m<sup>2</sup> by the vertically projected area of the sample package expressed in m<sup>2</sup>. This force shall be applied uniformly to two opposite sides of the package, one of them being the base on which it normally stands.

*Penetration test*

## Method:

1646

(1) The sample package is placed on a rigid, flat and horizontal surface which should not move significantly while the test is being carried out.

(2) A bar 32 mm in diameter, weighing 6 kg, and having a hemispherical end is, with its longitudinal axis vertical, released above the sample package and so guided that its end strikes the centre of the weakest part of the packaging and will strike the containment vessel if it penetrates far enough.

(3) The height of fall of the bar, measured from the latter's lower end to the upper surface of the sample package, must be 1 m. The bar must be made of a material which will not suffer significant deformation during the test.

*Methods prescribed for the tests referred to in marg. 452 (5), (b) and (c)*

1647

## (1) Exemptions:

The following are exempted from this test:

(a) Type-A packagings intended for liquids and satisfying the provisions of marg. 452 (5) (b) 1. or 2.;

(b) Containment vessels of type-A packagings intended for tritium having an activity below 200 Ci or for other gases having a total activity below 20 Ci.

## (2) Method:

(a) (i) In the case of type-A packagings intended for liquids, the package is dropped on to the target in such a way as to sustain the maximum damage with respect to containment;

(ii) In the case of type-A packagings intended for gases, the containment vessel is dropped on to the target in such a way as to sustain the maximum damage with respect to containment;

(b) The height of fall, measured from the lower part of the sample package in the case referred to in (a) (i) or of the containment vessel in the case referred to in (a) (ii) to the upper surface of the target, must be 9 m.

## (3) Target:

The target must have a flat, horizontal surface such that any increase in its resistance to displacement or deformation under impact does not significantly increase the damage sustained by the sample package or the containment vessel. Such a surface may, for example, be a steel plate placed on a concrete block of a mass not less than ten times that of any sample package subjected to the test. The concrete block must rest on firm ground, and the steel plate, not less than 1.25 cm thick, must be placed on the concrete when the latter is fresh, so as to ensure perfect adhesion.

*Methods prescribed for the tests referred to in marg. 452 (3) (i) and (6) (a); 455 (1) (b), (4) (a), (d), (f) and (h), and (6) (b); 456 (7) (a) 1. and (b) 2., and (10) (a) and (b) 2.; and 1622 (1) (b)*

**1648** The sample package must be subjected to the cumulative effects of the mechanical test referred to in marg. 1649, the thermal test referred to in marg. 1650 and, unless it is specifically exempted therefrom, the immersion test referred to in marg. 1651, in that order.

*Mechanical test*

**1649** (1) Exemptions: none.

(2) The test consists of the two falls mentioned below, sustained in an order chosen to cause damage such that the thermal test to which the package must then be subjected will produce the maximum effect. These two falls are described in paragraphs (3) and (4) below.

(3) (a) The sample package is dropped onto a target in such a way as to sustain the maximum damage;

(b) The target must be as specified in marg. 1647 (3);

(c) The height of fall, measured from the lowest point of the sample package to the upper surface of the target, must be 9 m.

(4) (a) The sample package is dropped onto a target in such a way as to sustain the maximum damage;

(b) The target consists of a solid mild-steel bar of circular cross-section 15 cm ± 0.5 cm in diameter, mounted vertically and rigidly on the base described in marg. 1647 (3). The surface of the target must be flat and horizontal, its edge being rounded to a radius of not more than 6 mm; the bar must be 20 cm long unless a longer bar would cause greater damage, in which case a bar sufficiently long to cause the maximum damage shall be used;

(c) The height of fall, measured from the lowest point of the sample package to the upper surface of the target, must be 1 m.

*Thermal test*

**1650** (1) Exemptions: none.

(2) A thermal test shall be considered satisfactory if the quantity of heat received by the sample package is not smaller than it would be if the whole package were exposed for 30 minutes to a radiant environment at 800° C having a radiation coefficient of 0.9, the surfaces of the package being assumed to have an absorption coefficient of 0.8.

If the packaging possesses a thermal insulation capable of being partly lost in conditions other than those simulated by the tests prescribed in marg. 1643 to 1646 and 1649 (e.g. rough scraping of the package), then only 50% of the packaging shall be assumed to be protected by that insulation.

(3) Method:

The thermal test method described below is regarded as meeting the conditions specified in (2) above:

(a) The sample package, at ambient temperature, is exposed to an open fire satisfying the conditions of paragraph (b) below. The package is so held that its bottom is 1 m above the bottom of the tank containing the fuel. The structure supporting the package must be such as to withhold only an insignificant fraction of the surface of the package from the direct action of the heat. The position of the package must be such that maximum damage occurs;

(b) The fire must be produced by burning in the open air a hydrocarbon which, obtained by the distillation of petroleum at a temperature not exceeding 330° C, has a flash-point of not less than 46° C and a gross calorific value of 11,100 to 11,700 kilocalories/kg. The fire must be such that all the sides of the package are exposed to a luminous flame between 0.7 m and 3 m thick. The tank must be of such a depth that the fuel fills it almost to the brim;

(c) The sample package is exposed to the fire for 30 minutes in the conditions described above. It must not be artificially cooled until three hours have elapsed, unless it can be shown by means of a thermocouple or by any other means that the internal temperature has begun to fall.

*Immersion test*

1651 (1) Exemptions: packages other than those of Nuclear Safety Classes I and II.

(2) Method:

(a) The package must be so immersed in water that the joint or joints to be tested\* are not less than 90 cm below the surface for at least 8 hours;

(b) The temperature of the sample package at the time of immersion must be 5° to 15° C higher than that of the water.

*Verifying containment and shielding*

1652 (1) Leakproofness:

Any commonly accepted test may be used to establish that the conditions of marg. 1641 (4) are met.

(2) Shielding:

(a) For packagings of types A and B following the tests described in marg. 1642 to 1646:

1. The entire surface of the sample package containing a suitable source is examined by means of a radiographic film or a suitable instrument to verify that the effectiveness of the shielding has not materially diminished.

\* "Joint to be tested" means each set of joints on a single packaging receptacle; testing starts with the outer receptacle and continues until the leakproof level is reached.

2. The phrase "the effectiveness of the shielding has not materially diminished" means that the dose rate of the radiation on the surface of the sample package, when the latter contains an iridium-192 source, has not notably increased at any point after the pertinent tests. If the packaging is intended for one particular radionuclide only, the latter may be used as the source instead of iridium-192.

(b) For packagings of type B following the tests described in marg. 1648 to 1651:

1. The entire surface of the sample package containing a suitable source is examined by means of a suitable instrument to determine whether the effectiveness of the shielding has diminished.
2. If it is ascertained that the effectiveness of the shielding has diminished at any point on the surface of the sample package, it must be established by measurements and by calculation that the radiation emerging from the package meets the conditions specified in marg. 1452 (6) (a) (ii).

1653-  
1660

## II. Capsules

[marg. 450, note 4 (b)]

### *General*

- 1661 (1) The design of the sample capsule to be tested must be that prescribed for carriage and its contents must resemble as closely as possible, particularly as regards radiation and specific activity, the radioactive substance which the sample capsule concerned is to contain.

(2) A different sample capsule may be used for each of the tests listed in marg. 1662.

(3) After each test, a check of tightness (leakproofness) shall be carried out by a method which must not be less sensitive than the method described in marg. 1663.

### *Test methods*

- 1662 (1) Impact test:

The sample capsule is dropped on to a target from a height of 9 m. The target must have a flat, horizontal surface such that any increase in its resistance to displacement or deformation under the impact of the capsule does not significantly increase the damage sustained by the capsule.

- (2) Percussion test:

The sample capsule is placed on a lead sheet lying on a hard, smooth surface; it is struck with the flat face of a steel hammer so that the impact is equivalent to that of a weight of 1.4 kg falling freely from a height of 1 m. The flat face of the hammer must be 2.5 cm in diameter, its edge being rounded to a radius of not less than 3 mm. The lead sheet, which must have a Vickers hardness of 3.5 to 4.5, must not be more than 25 mm thick and must be larger than the capsule. If the test is repeated, the capsule must be placed on an intact part of the lead each time.

- (3) Thermal test:

The sample capsule is heated in air to a temperature of 800° C, kept at that temperature for ten minutes, and then allowed to cool.



## (4) Immersion test:

The sample capsule is immersed for twenty-four hours in water at ambient temperature. The water must have a pH value between 6 and 8 and a conductivity not exceeding 10 micromhos per cm.

*Method of assessing leakproofness*

1663

## (1) Test 1:

Immerse the sample capsule in a solution which cannot attack the material of the capsule and which, in the conditions of the test, has shown itself to be capable of entraining the radionuclide in question. Heat the solution to  $50^{\circ}\text{C} \pm 5^{\circ}\text{C}$  and keep it at that temperature for eight hours.

## (2) Test 2:

Keep the sample capsule for not less than seven days and then repeat test 1.

If the total activity of each solution is below 0.05 microcurie, the capsule is to be considered leakproof.

1664-  
16991700-  
1799APPENDIX VII  
(reserved)1800-  
1899APPENDIX VIII  
(reserved)

## APPENDIX IX

1. *Regulations relating to danger labels*

1900

With the exception of labels Nos. 6 A, 6 B, 6 C and 10, the dimensions prescribed for labels are those of the standard A 5 format (148 × 210 mm). The dimensions of the labels to be affixed to packages may be reduced to a format not smaller than A 7 (74 × 105 mm). Labels Nos. 6 A, 6 B and 6 C must have sides 10 cm long.

1901

(1) Danger labels must be stuck on packages, wagons and small containers or affixed in some other suitable manner. Only where the external state of a package does not allow this should they be stuck on cards or tablets securely attached to the package. On outer packagings, private wagons and small containers, indelible danger markings corresponding exactly to the prescribed models may be used instead of labels.

(2) It is incumbent on the sender to affix the labels:

- (a) To packages, whether handed over for carriage in full or less than full wagon loads;
- (b) To all containers;
- (c) To wagons carrying full wagon loads;
- (d) To wagons containing packages loaded by the sender.

(3) In all other cases, it is incumbent on the railway to label the wagons.

2. *Explanation of the diagrams*

1902 The danger labels prescribed for substances and articles of Classes I to VII (see diagrams on p. 320) signify:

- No. 1 (*black bomb on orange background*): danger of explosion;  
prescribed in marg. 37 (1), 43 (1) and (2), 75, 80 (1) and (2);  
for prohibitions on mixed loading, see marg. 42, 44, 79, 81;
- No. 2 (*black flame on orange background*): danger of fire;  
prescribed in marg. 154 (3), 164 (2) and (3), 188 (2), 213 (1), 220 (1) and (2), 307 (1), 313 (1) and (3), 344 (1), 351 (1) and (2), 432 (1), 440 (1), 711 (1), 717 (1) and (2);  
for prohibitions on mixed loading, see marg. 219, 221, 312, 314, 350, 352, 716, 718;
- No. 3 (*flame above a circle, black on orange background*): oxidising substance;  
prescribed in marg. 381 (1), 388 (1), (2) and (3);  
for prohibitions on mixed loading, see marg. 387, 389;
- No. 4 (*black skull and cross bones on orange background*): poisonous substance; to be kept apart in wagons and goods depots from foodstuffs or other articles for consumption;  
prescribed in marg. 307 (2), 313 (2) and (3), 316 (3), 432 (1), 440 (1) and (2), 443 (3);  
for prohibitions on mixed loading, see marg. 439, 441;
- No. 4 A (*black St. Andrew's Cross on orange background, without frame*): harmful substance;  
prescribed in marg. 432 (1), 440 (1) and (2), 443 (3);
- No. 5 (*drops falling from one test tube on to a plate and from another test tube on to a hand; black on orange background*): corrosive substance;  
prescribed in marg. 381 (1), 388 (2), 524 (1), 532 (1) and (2), 535 (3);  
for prohibitions on mixed loading, see marg. 530, 533;
- NOTE. The earlier label showing a black carboy on an orange background may be used instead of label No. 5 during a transitional period extending to the end of the year 1968.
- No. 6 A (label in the form of a diamond-shaped square, stylised trefoil, inscription RADIOACTIVE, a vertical stripe in the lower half, with the following text\*): Contents . . . Activity . . . *black* symbol and words *on white background, vertical red stripe*: radioactive substance in packages of Category I-WHITE; in the event of damage to packages, danger to health by ingestion or inhalation of or contact with spilt contents;  
prescribed in marg. 459 (1), 466 (2);  
for prohibitions on mixed loading, see marg. 467;
- No. 6 B (like the foregoing, but with two vertical stripes in the lower half, with the following text\*): Contents . . . Activity . . . Transport Index *black*

\* The text must be printed in an official language of the country of origin and in addition, in French, German or Italian, unless international tariffs or agreements concluded between railway administrations provide otherwise.

symbol and words; *upper half, yellow background; lower half, white background; vertical red stripes*: radioactive substance in packages of Category II-YELLOW; packages to be kept away from packages bearing a label with the word FOTO (see marg. 1605); in the event of damage to packages, danger to health by ingestion or inhalation of or contact with spilt contents, and risk of external radiation at a distance;

prescribed in marg. 459 (1), 466 (2);

for prohibitions on mixed loading, see marg. 467;

- No. 6 C (like the foregoing but with three vertical stripes in the lower half): radioactive substance in packages of Category III-YELLOW; packages to be kept away from packages bearing a label with the word FOTO (see marg. 1605) and near which one should not remain unnecessarily; in the event of damage to packages, danger to health by ingestion or inhalation of or contact with spilt contents, and risk of external radiation at a distance;

prescribed in marg. 459 (1), 466 (2);

for prohibitions on mixed loading, see marg. 467;

- No. 6 D (stylised trefoil, inscription RADIOACTIVE, with the following text\*): Do not approach unnecessarily; *black symbol and words on orange background*): radioactive substance presenting the dangers described under 6 A, 6 B and 6 C;

prescribed in marg. 466 (1);

for prohibitions on mixed loading, see marg. 467;

- No. 7 (open *black umbrella on white background*): to be kept dry;

prescribed in marg. 188 (1), 195 (2);

for prohibitions on mixed loading, see marg. 194, 196;

- No. 8 (two *black arrows on white background*): this side up; label to be affixed, with arrows pointing upwards, on two opposite sides of the package;

prescribed in marg. 37 (2), 154 (2), 188 (3), 213 (2) and (3), 307 (3), 344 (2), 381 (2), 432 (2), 459 (3), 524 (2) and (3), 614, 711 (2);

- No. 9 (*red wineglass on white background*): handle with care, or: keep upright;

prescribed in marg. 37 (2), 43 (2), 112, 117, 154 (1), (2), and (3), 164 (4), 188 (3), 195 (2), 213 (3), 220 (2), 307 (3), 313 (3), 344 (2), 351 (2), 381 (2), 388 (4), 432 (2), 440 (2), 459 (3), 524 (2), 532 (2), 614, 620, 711 (2), 717 (2);

- No. 10 (triangular *red label with an exclamation mark in black*): shunt with care;

prescribed in marg. 164 (1), 220 (3), 313 (1).

1903-  
1999

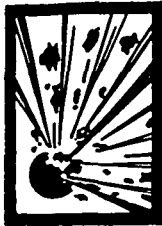
\* The text must be printed in an official language of the country of origin and in addition in French, German or Italian, unless international tariffs or agreements concluded between railway administrations provide otherwise.

*Danger labels*

For explanation of the diagrams: See Appendix IX (marg. 1902)

Reproduction on a reduced scale from standard format A 5 (148 × 210 mm)

N° 1

Marg. 37, 43, 75,  
Rn. 80

N° 2

Marg. 154, 164, 188, 213, 220,  
Rn. 307, 313, 344, 351, 432,  
440, 711, 717

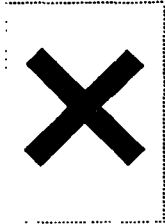
N° 3

Marg. 381, 388  
Rn. 535

N° 4

Marg. 307, 313, 316, 432,  
Rn. 440, 443

N° 4 A

Marg. 432, 440, 443  
Rn. 535

N° 5

Marg. 381, 388, 524, 532,  
Rn. 535

N° 6 A

Marg. 459, 466  
Rn. 535

N° 6 B

Marg. 459, 466  
Rn. 535

N° 6 C

Marg. 459, 466  
Rn. 535

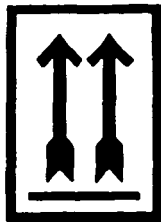
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N° 7

Marg. 188, 193  
Rn. 535

N° 8

Marg. 37, 154, 188, 213,  
Rn. 307, 344, 381, 432,  
459, 524, 614, 711

N° 9

Marg. 37, 43, 112, 117, 154,  
Rn. 164, 188, 193, 213, 220,  
307, 313, 344, 351, 381,  
388, 432, 440, 459, 524,  
532, 614, 620, 711, 717

N° 10

Marg. 164, 220, 313  
Rn. 535

*Note by the Central Office concerning the sphere of application*

CIM of 25 February 1961 and its Annex I (RID) are applicable in the following States:

Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, Finland, France, Germany, Greece, Hungary, Iraq, Italy, Liechtenstein, Luxembourg, Morocco, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Syria, Tunisia, Turkey, United Kingdom and Yugoslavia.

As regards traffic between the Continent and the United Kingdom attention is drawn to the fact that, in accordance with the Additional Protocol of 25 October 1952, the CIM Revision Conference of October 1952 decided to draw up a special appendix to RID containing special regulations for rail-sea carriage of dangerous goods between the Continent and the United Kingdom. The Additional Protocol of 25 February 1961 has laid down that, pending the conclusion and entry into force of this appendix, dangerous goods carried under CIM to or from the United Kingdom shall comply with the regulations of RID and, in addition, with the United Kingdom conditions for the carriage of dangerous goods by rail and by sea.

A N N E X I I

*(Article 6)*

*[For technical reasons it has been decided not to publish here the five sheets containing forms provided for in article 6 (1). However, they are annexed to the original registered with the Secretariat of the United Nations.]*

ANNEX III

(Article 12)

ABSENCE OR INADEQUACY OF PACKING

GENERAL DECLARATION

At my request the ..... Railway will accept for carriage as from to-day the goods hereinafter designated, which will be tendered by me at ..... station, to be forwarded by:

*grande vitesse\**

*petite vitesse\**

express parcels service\*

.....  
.....  
.....

I acknowledge that these goods when the transport document refers to this declaration, are tendered for carriage

without packing\*

with defective packing, the description of which is as follows\*:

.....  
.....  
.....

At ....., date ..... 19 .....  
(Signature)

\* Delete whichever does not apply.

## ANNEX IV a

(Article 21)

## MODIFICATIONS IN THE CONTRACT OF CARRIAGE ORDERED BY THE SENDER

The ..... Railway at ..... station\* is requested to make the following modifications\*\* in the contract of carriage for the under-mentioned consignment:

Marks and numbers	Number of packages	Nature of packing	Description of goods	Weight in kilogrammes
tendered for carriage with the <i>grande</i> <i>petite</i> vitesse consignment note dated .....				
.....19 ..... and addressed to M..... at .....				
1. to be returned to sender at the forwarding station;				
2. to be stopped in transit pending further orders;				
3. delivery to be withheld pending further orders;				
4. to be delivered to M.....at .....				
5. to be forwarded by <i>grande</i> <i>petite</i> vitesse to M..... at ..... station on the ..... Railway;				
6. to be returned by <i>grande</i> <i>petite</i> vitesse to M..... at the forwarding station;				
7. to be delivered only against payment of a "cash on delivery" charge of _____ in figures _____ in words				
8. to be delivered against payment of a "cash on delivery" charge of _____ in figures _____ in words instead of the "cash on delivery" charge specified in the consignment note;				
9. to be delivered without collection of the "cash on delivery" charge;				
10. to be delivered " <i>franco</i> "..... At....., date ..... 19. .... (Signature)				

To ..... station ..... Railway.

The above orders are transmitted for effect to be given thereto under the conditions prescribed in Article 23 (1) of the International Convention concerning the Carriage of Goods by Rail (CIM). These orders have been reproduced in the consignment note duplicate which has been presented by the sender. The document delivered to the sender for the "cash on delivery" charge has been corrected withdrawn. This declaration refers to consignment No. .... forwarded in wagon No. .... and to our telegram No. .... /to our telephone communication of .....

At....., date ..... 19. ....

Station-master.

\* Insert here the name of the forwarding station.

\*\* Delete the instructions which do not apply.

## ANNEX IV b

(Article 22)

MODIFICATIONS IN THE CONTRACT OF CARRIAGE ORDERED  
BY THE CONSIGNEE

The ..... Railway at ..... station\*  
is requested to make the following modifications\*\* in the contract of carriage for the undermentioned consignment:

Consign- ment No.***	Wagon *No.***	Marks and numbers	Number of packages	Nature of packing	Description of goods	Weight in kilogrammes

tendered for carriage with *grande*  
*petite* vitesse consignment note dated  
.....19..... by M..... at .....

and addressed to M..... at .....

1. to be stopped in transit pending further orders;
2. delivery to be withheld pending further orders;
3. to be delivered to M..... at .....
4. to allow me  
to allow my agent M..... to be present at the customs  
or other administrative formalities;  
to allow me
5. to allow my agent M..... to complete the customs or  
other administrative formalities and, as necessary, pay the customs duty  
and other charges;\*\*\*\*
6. to be forwarded by *grande*  
*petite* vitesse to M.....  
at ..... station on the..... Railway  
At....., date.....19 ..  
(Signature)

To the ..... station ..... Railway.

The above orders are transmitted for effect to be given thereto under the conditions prescribed in Article 23 (1) of the International Convention concerning the Carriage of Goods by Rail (CIM). This declaration refers to our telegram No. .... /to our telephone communication of .....

At ....., date ....., 19 ..  
Station-master.

\* Insert here either the name of the destination station or of the station of entry into the country of destination.

\*\* Delete the instructions which do not apply.

\*\*\* If known.

\*\*\*\* The consignee may not give this order unless authorized under Article 15 (1) (b) of this Convention.



## ANNEX V

## (Article 58)

REGULATIONS CONCERNING THE CENTRAL OFFICE FOR  
INTERNATIONAL RAILWAY TRANSPORT

*Article 1.* 1. The Central Office for International Railway Transport shall be situated at Berne under the auspices of the Swiss Government.

The administrative and financial control of its affairs shall, for the purposes of article 58 of this Convention, be entrusted to an Administrative Committee.

For this purpose the administrative Committee shall:

- (a) Superintend the application by the Central Office of the Conventions and other instruments adopted by revision conferences and, if necessary, recommend measures to be taken to facilitate the application of such Conventions and other instruments;
- (b) Give reasoned opinions on questions submitted to it by a Contracting State or by the director of the Office which may affect the work of the Central Office.

2. (a) The Administrative Committee shall meet at Berne. It shall be composed of nine members chosen from the Contracting States.

(b) Switzerland shall have a permanent seat on the Committee and will supply the Chairman. The other member States shall be nominated for five years. For each five-year period a Diplomatic Conference shall, on the basis of proposals submitted by the Administrative Committee in office, determine the composition of the Administrative Committee having regard to an equitable geographical distribution of seats.

(c) If a vacancy occurs among the member States, the Administrative Committee shall itself nominate another Contracting State to fill the vacancy.

(d) Each member State shall appoint as its delegate to the Administrative Committee a person qualified by virtue of experience in international transport matters.

(e) The Administrative Committee shall determine its own constitution and rules of procedure.

It shall hold at least one ordinary meeting each year and extraordinary meetings at the request of three or more member States.

The secretariat of the Administrative Committee shall be supplied by the Central Office.

The minutes of the meetings of the Administrative Committee shall be sent to all Contracting States.

(f) No charge shall be made for the services of the delegate of each member State and his expenses shall be borne by that State.

3. (a) The Administrative Committee shall make regulations to govern the organisation, working and staff of the Central Office. The Swiss Government shall put before them draft proposals to that effect.

(b) The Administrative Committee shall appoint the director, vice-director and counsellors of the Central Office, and the Swiss Government shall propose candidates in that behalf. In making such appointments, the Administrative Committee shall have special regard to the ability of the candidates and to an equitable geographical distribution.

(c) The annual budget of the Central Office shall be subject to the approval of the Administrative Committee which shall have regard to the provisions of article 2 below, and the annual report shall be subject to the like approval.

The audit of the Central Office accounts dealing only with the reconciliation of figures and vouchers within the limits of the budget shall be carried out by the Swiss Government who shall forward the accounts together with a report on them to the Administrative Committee.

The Administrative Committee shall send to the Contracting States, together with the Central Office report and annual statement of accounts, copies of the decisions, resolutions and recommendations which the Committee has been called upon to make.

(d) The Administrative Committee shall place before each revision conference, at least two months before it meets, a report on the whole of the Committee's work since the preceding conference.

*Article 2.* 1. The expenses of the Central Office shall be borne by the Contracting States in proportion to the length of the railway lines or routes to which the Convention applies. Shipping services shall, however, only contribute in respect of one-half the length of their routes. The maximum contribution for all States shall be 1 fr. 40 per kilometre. In exceptional circumstances such contribution may be reduced, by agreement between the State concerned and the Central Office and with the approval of the Administrative Committee, to fifty per centum of the maximum in the case of lines operated under special conditions. The amount of the contribution per kilometre for each financial year shall be fixed by the Administrative Committee after consultation with the Central Office and the total amount so fixed shall always be collected. When the actual expenditure of the Central Office is less than the sum so calculated the balance in hand shall be paid in to a reserve fund.

2. When submitting its annual report and accounts to the Contracting States, the Central Office shall invite them to pay their contributions towards the expenditure of the past financial year. Any State which has not paid its contribution by 1st October shall be again requested to do so. If this request has no effect, the Central Office shall send a further reminder at the beginning of the following year when forwarding the report for the preceding year. If no reply has been received by the 1st July following, a fourth approach shall be made to the State in arrear for payment of the two annual contributions due. Failing receipt of a satisfactory reply within three months the Central Office shall notify the State in question that if payment is not made by the end of the year that fact will be treated as an indication of its intention to withdraw from the Convention. If by 31st December these last representations have had no effect, the Central Office shall, in view of the fact that the defaulting State is to be deemed to have indicated its intention to withdraw, delete the lines of that State from the list of lines open to international traffic.

3. Sums not recovered shall, so far as possible, be made good out of the general reserves at the disposal of the Central Office and may be spread over four financial years. Any part of a deficit not made good in this way shall be debited, in a special account, to the other Contracting States in proportion to the number of kilometres of line which are subject to the Convention at the date of the opening of the account to the extent that each State has been a party to the Convention during the period of two years preceding the withdrawal of the defaulting State.

4. A State whose lines have been deleted from the list in the circumstances set out in paragraph 2 above can only have them reinstated in respect of international transport by prior payment of the amounts outstanding for the years concerned with interest thereon at five per centum as from the end of the sixth month following the date on which the Central Office first requested payment of the contribution due.

*Article 3.* 1. The Central Office shall publish a monthly bulletin containing all the information necessary for the operation of the Convention and, in particular, announcements relating to the list of railway lines and other transport services and to articles not acceptable for carriage or acceptable only under certain conditions. The Office shall also publish studies in the bulletin as it may think fit.

2. The bulletin shall be printed in French and German. A copy shall be sent free to each Contracting State and to each transport administration concerned. Further copies may be obtained at the price fixed by the Central Office.

*Article 4.* 1. Overdue bills and accounts in respect of international transport may be forwarded to the Central Office by the creditor undertaking with a request for its assistance in securing payment. The Central Office shall then formally call upon the debtor undertaking to pay the sum due or state the reasons for its failure to do so.

2. If the Central Office considers that the grounds for refusal are adequate, it shall advise the parties to have recourse to the competent court or, if the parties so request, to the arbitration tribunal provided for in article 61 of the Convention (Annex X).

3. If the Central Office considers that the whole or part of the sum is properly due it may, after taking expert advice, call upon the debtor undertaking to pay the whole or that part of the debt, as the case may be, to the Central Office; the sum so paid shall be retained until the competent court or the arbitration tribunal provided for in article 61 of the Convention (Annex X) has decided the case.

4. If its directions are not complied with within fifteen days the Central Office shall address a further demand to the debtor undertaking and draw attention to the consequences of non-compliance.

5. If no response has been obtained within ten days after such further demand, the Central Office shall notify the State to which the transport undertaking belongs of the action and the grounds therefor and request the State to consider what further action should be taken and, in particular, whether the lines of the debtor undertaking should remain on the list.

6. If the State to which the debtor undertaking belongs either declares that, notwithstanding the default, it is not prepared to have the lines of the undertaking deleted from the list, or fails to reply to the Central Office communication within a period of six weeks, that State shall be deemed to have agreed to guarantee the solvency of the undertaking in respect of debts arising out of international transport.

*Article 5.* Charges shall be made to cover the expenses of the activities set out in article 58 (1) (d) to (f) of the Convention. The amount of such charges shall be determined by the Administrative Committee on the advice of the Central Office.

## A N N E X V I

(Article 69 (3) and (4))

### RULES RELATING TO THE REVISION COMMITTEE AND THE COMMITTEES OF EXPERTS

*Article 1.* The Governments of the Contracting States shall forward their proposals relating to matters within the competence of the Committees to the Central Office for International Railway Transport, which will immediately communicate them to the other Contracting States.

*Article 2.* The Central Office shall invite the Committees to meet whenever it becomes necessary to do so or at the request of at least five Contracting States.

Every Contracting State shall be notified two months in advance of meetings of the Committees. The notice shall state precisely the questions which have been put down for inclusion in the agenda.

*Article 3.* All Contracting States may take part in the work of the Committees.

A State may arrange to be represented by another State; no State may, however, represent more than two other States.

Each State shall bear the cost of its representation.

*Article 4.* The Central Office shall report and advise upon the questions to be dealt with and shall provide the secretariat for the Committees.

The Director and Vice-Director of the Central Office shall attend the meetings of the Committees in an advisory capacity.

*Article 5.* With the agreement of the majority of the Contracting States, the Central Office shall invite to attend meetings of the Committees, in an advisory capacity, representatives of:

- (a) Non-Contracting States;
- (b) Intergovernmental organisations which are concerned with transport matters (the invitation to be on a reciprocal basis);
- (c) International non-governmental organisations dealing with transport (the invitation to be on a reciprocal basis).

*Article 6.* The Committees shall be properly constituted when one-third of the number of Contracting States are represented.

*Article 7.* The Committees shall appoint for each session a chairman and one or two vice-chairmen.

*Article 8.* The proceedings shall be transacted in French and German. The substance of the remarks of members of the Committee shall immediately be translated *viva voce*. The text of proposals and of statements by the chairman shall be translated in full.

*Article 9.* Voting shall take place by delegations and, on request, in answer to their names; each delegation of a Contracting State represented at the meeting shall have one vote.

A proposal shall not be adopted unless:

- (a) Not less than half of the delegations represented on the Committee have voted on it;
- (b) It has obtained a majority of the votes cast: votes cast shall not include abstentions.

*Article 10.* The minutes of meetings shall summarise the proceedings in the two languages.

Proposals and decisions must appear verbatim in the minutes in both languages. In the event of divergence between the French and German versions of the minutes in regard to decisions, the French text shall prevail.

The minutes shall be circulated to members as soon as possible.

If the minutes cannot be approved during the session members shall send to the secretariat within a reasonable time any necessary amendments.

*Article 11.* To facilitate their work, the Committees may set up sub-committees. They may also set up sub-committees for the purpose of preparing specified matters for a subsequent session.

Each sub-committee shall appoint a chairman, a vice-chairman and, if need be, a reporter. Otherwise the provisions of articles 1 to 5 and 8 to 10 of this Annex shall apply to the sub-committees with any necessary modifications.

## ANNEX VII

(Article 60 (1))

INTERNATIONAL REGULATIONS CONCERNING THE HAULAGE  
OF PRIVATE OWNERS' WAGONS (RIP)<sup>1</sup>*Article 1. OBJECT AND SCOPE OF THE REGULATIONS*

1. These regulations shall apply to all haulage of private owners' wagons, empty or loaded, accepted for international traffic in accordance with the provisions of article 2 of this Annex and consigned under the conditions of the International Convention concerning the Carriage of Goods by Rail (CIM).

2. In the absence of specific provisions in these regulations, the other provisions of the CIM shall apply to the consignments referred to in paragraph 1 above.

*Article 2. ACCEPTANCE OF WAGONS FOR INTERNATIONAL TRAFFIC*

To be accepted for international traffic, wagons shall be registered in the name of a private party (whether an individual, a firm or a corporate body) by a railway to which the CIM applies and shall be marked by that railway with the distinguishing mark [P].

In these regulations the private party, whose name shall be marked on the wagon, is referred to as the "owner".

*Article 3. USE OF WAGONS*

The sender may only use the wagon for the carriage of goods for which it is designated in accordance with the registration contract. The sender shall be solely responsible for consequences which may result from disregard of this provision.

*Article 4. EQUIPMENT AND SPECIAL APPARATUS*

If the wagon is equipped with special apparatus (refrigerating equipment, water tanks, machinery, etc.), the sender shall be responsible for the servicing of such equipment or for arranging for this to be done. This duty shall pass to the consignee as soon as he exercises his rights under article 16 or 22 of the CIM.

*Article 5. OFFERING OF WAGONS FOR HAULAGE*

1. The right to offer a wagon for haulage shall be vested in the owner.

Any other sender of a wagon, whether it be empty or loaded shall present at the forwarding station, at the same time as the consignment note, an authority granted by the owner, which may relate to several wagons.

Such authority shall not be required if the sender was the consignee of the wagon on its last journey and if, up to the time when the new contract of carriage is made, the station has not received by letter or by telegram from the owner orders not to despatch the wagon or wagons without his authority.

<sup>1</sup> Annex VII was adopted on 29 April 1964 after having been subjected to a special revision procedure by a Commission of Governmental Experts and entered into force on 1 January 1965 at the same time as the Convention.

2. In the absence of the owner's orders to the contrary, the railway shall be entitled to return any wagon to its home station at the owner's expense, and under cover of a consignment note made out in his name and with his address:

—If the wagon arrives empty, and its loading has not been started within 15 days from the time it became available;

—If the wagon arrives loaded, and has not been reconsigned within 8 days from the time when its unloading was completed.

If the railway does not avail itself of this power it shall, on expiry of the foregoing periods, advise the owner of the whereabouts of the wagon; in such case the railway shall not be entitled to return the wagon until the end of the eighth day following the day of despatch of advice to the owner.

The provisions of this paragraph shall not apply to wagons within the country of the railway which has registered them nor to wagons on private sidings.

3. A hirer whose name is marked on the wagon with the consent of the registering railway shall for the purposes of this article be treated as if he were the owner.

#### *Article 6. PARTICULARS IN THE CONSIGNMENT NOTE*

1. In addition to the particulars required by the CIM, the sender shall enter the following particulars in the consignment note:

(a) In the case of an empty wagon: in the column headed "Description of goods", the words "private owner's wagon empty", and, under the heading "Wagons", the characteristics of the wagon;

(b) In the case of a loaded wagon: in the column headed "Description of goods", after the description of the goods, the words "loaded in private owner's wagon", and, under the heading "Wagons", the characteristics of the wagon.

2. If the sender of an empty wagon wishes to obtain an additional guarantee of the transit period as provided for in article 12 of this Annex, he shall enter in the space headed "Declarations" the words "additional guarantee of transit period".

#### *Article 7. "CASH ON DELIVERY" CHARGES AND DISBURSEMENTS*

1. Empty wagons shall not be consigned subject to "cash on delivery" charges or disbursements.

2. The haulage of loaded wagons may be subject to a "cash on delivery" charge provided it does not exceed the value of the goods loaded therein.

#### *Article 8. DECLARATION OF INTEREST IN DELIVERY*

1. Declaration of interest in delivery of empty wagons shall not be allowed.

2. Declaration of interest in delivery of loaded wagons shall affect only the goods loaded therein.

#### *Article 9. SUSPENSION OF TRANSIT PERIOD*

1. In addition to the cases provided for in article 11 (7) of the CIM, the transit period shall similarly be suspended during every interruption of transport caused by damage to the wagon, unless the railway is liable for such damage under article 13 of this Annex.

2. When the goods loaded in the damaged wagon are transhipped into another wagon the transit period shall begin to run again in respect of the goods from the time when, after transhipment, they can again be forwarded.

*Article 10. REPORTING OF DAMAGE TO WAGONS OR LOSS OF PARTS*

1. When damage to a wagon or loss of parts is discovered or presumed by the railway or alleged by the party concerned, the railway shall draw up, in accordance with the provisions of article 45 of the CIM, a report stating the nature of the damage or loss and, so far as possible, its cause and the time of its occurrence.

Such report shall be sent without delay to the registering railway, which shall send a copy of it to the owner.

2. If the wagon is loaded, a separate report shall, where necessary, be drawn up in respect of the goods in accordance with the provisions of article 45 of the CIM.

*Article 11. DAMAGE TO A WAGON PREVENTING CONTINUATION OF HAULAGE*

1. If a wagon consigned empty is so damaged as to prevent the continuation of haulage or to render such wagon unfit to carry a load, the station where the damage is discovered shall without delay advise the sender and the owner by telegram, indicating as far as possible the nature of the damage.

2. If an empty wagon is withdrawn from service it shall be put into a fit state to run by the railway, unless the damage is so serious that it has to be loaded on to another wagon.

In order to render the wagon fit for use the railway may of its own accord carry out repairs up to a limit of 300 francs.

The railway shall, through the registering railway, inform the owner concisely of any important repairs which have been carried out under the first and second sub-paragraphs hereof.

These provisions shall apply without prejudice to the question of liability.

3. If the railway carries out repairs in accordance with paragraph 2 of this article, and if such work is expected to take more than four days to complete, the railway shall request the sender by telegram to advise it whether, when the work has been completed, the contract of carriage is to be carried out or modified.

If no instructions have been received from the sender before the completion of the work the contract of carriage shall be carried out.

4. If the railway does not carry out the repairs of its own accord the station where the damage is discovered shall request the sender's instructions by telegram, directly and without delay. If the sender is not also the owner, the text of this request shall be transmitted without delay to the owner by telegram.

In the absence of instructions from the sender within a period of eight days from the date of despatch of the telegram, the railway shall be entitled, after having if need be put the wagon into a fit state to run, to return it to its home station under a consignment note made out in the name of and with the address of the owner.

The reasons for its return shall be stated in the consignment note in the space headed "Description of goods".

5. If damage prevents the continuation of the haulage of a wagon consigned loaded and unloading is necessary, the provisions of this article shall apply to the unloaded wagon.

If the wagon can be repaired without unloading, the provisions of paragraphs 1, 2, 3, 6 and 7 of this article shall apply.

6. The carriage and other charges which have accrued up to the station at which the wagon was stopped, the cost of notifying the sender and the owner, as well as any charges

for complying with the sender's instructions or for returning the wagon to its home station shall be charged against the consignment.

7. A hirer whose name is marked on the wagon with the consent of the registering railway shall, for the purposes of this article, be treated as if he were the owner.

*Article 12. AMOUNT OF COMPENSATION FOR EXCEEDING THE TRANSIT PERIOD*

1. If the railway is responsible for exceeding the transit period for an empty or loaded wagon, it shall pay the party concerned by way of liquidated damages the sum of 4 francs for each complete day, or fraction thereof, of delay, irrespective of any compensation which may be due for exceeding the transit period for goods loaded in the wagon.

2. The sender of an empty wagon may request an additional guarantee of the transit period. A charge of 1 franc per 100 kilometres\* or fraction thereof shall then be made, subject to a minimum of 10 francs.

In such case, if the transit period is exceeded, the railway shall pay by way of liquidated damages the sum of 8 francs per day, subject to a minimum of 20 francs.

3. If the exceeding of the transit period is due to wilful misconduct or gross negligence on the part of the railway, the liquidated damages shall be at the rate of 8 francs per day.

*Article 13. LIABILITY OF THE RAILWAY FOR LOSS OF OR DAMAGE TO THE WAGON OR ITS PARTS*

1. In the case of loss of or damage to the wagon or its parts sustained between the time of acceptance for haulage and the time of delivery, the railway shall be liable unless it proves that the loss or damage was not caused by the wrongful act or neglect on the part of the railway.

2. In the case of loss of the wagon, compensation shall be limited to the value of the wagon; the basis of the calculation of such value shall be determined in the registration contract.

In the case of damage, compensation shall be calculated in accordance with the provisions of the registration contract.

3. In the case of loss of or damage to removable parts, the railway shall only be liable if such parts are listed on both sides of the wagon. The railway shall not be liable for loss of or damage to loose equipment.

4. Unless the claimant proves that the damage was caused by the wrongful act or neglect of the railway, the railway shall only be liable

—For damage to receptacles made of pottery, glass, terra-cotta, etc., if the damage is connected with damage to the wagon itself for which the railway is liable under the foregoing provisions;

—For damage to receptacles with interior linings (enamel, ebonite, etc.) if the receptacles show signs of external damage for which the railway is liable under the foregoing provisions.

5. The owner shall be treated as if he were the sender or the consignee, as the case may be, in respect of compensation for loss of or damage to the wagon or its parts. Claims shall only be made to the registering railway and legal proceedings shall only be instituted against that railway which shall be treated, in respect of compensation, as if it were the railway responsible.

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\* Approximately 62 miles.



*Article 14.* PRESUMPTION OF LOSS OF WAGON. POSITION IF SUBSEQUENTLY RECOVERED

1. A wagon shall be deemed lost when it cannot be put at the disposal of the consignee within the three months following the expiry of the transit period.

Such period shall be extended by the period during which the wagon is immobilised through any cause not attributable to the railway or through damage.

2. If a wagon which has been deemed lost is recovered after compensation has been paid, the owner may require, within a period of 6 months from his receipt of notice to that effect from the railway of registration, that the wagon be returned to him free of charge at its home station against refund of the compensation.

A N N E X V I I I

(*Article 60 (2)*)

INTERNATIONAL REGULATIONS CONCERNING THE CARRIAGE  
OF CONTAINERS (RICO)<sup>1</sup>

Chapter I. GENERAL

*Article 1.* OBJECT AND SCOPE OF THE REGULATIONS

1. These regulations shall apply to the carriage of containers belonging to a railway or belonging to private owners (whether individuals, firms or corporate bodies) and accepted by the railway, which are tendered for carriage under the conditions of the International Convention concerning the Carriage of Goods by Rail (CIM).

2. For the purpose of these regulations, any receptacle (case, crate, tank, etc.) so constructed as to facilitate the door-to-door carriage of goods by rail only or by rail in combination with other means of transport shall be deemed to be a container.

*Article 2.* GENERAL PROVISIONS

1. Except as otherwise provided in the tariffs the contents of the container can only be the subject of a single contract of carriage.

2. In the absence of special provisions in these regulations the other provisions of the CIM shall apply to the carriage of containers whether empty or loaded.

*Article 3.* DOOR-TO-DOOR CARRIAGE

In the case of consignments to be collected by the railway at the sender's premises or to be delivered by the railway at the consignee's premises, the contract of carriage shall be deemed to be made at the sender's premises or terminated at the consignee's premises, as the case may be.

Chapter II. RAILWAY-OWNED CONTAINERS

*Article 4.* SUPPLY. CHARGES

So far as the railway is able to provide containers, it shall make them available to senders. A charge may be made for the use of containers and the amount of such charge shall be fixed by the tariffs or regulations.

<sup>1</sup> Annex VIII was adopted on 29 April 1964 after having been subjected to a special revision procedure by a Commission of Governmental Experts and entered into force on 1 January 1965 at the same time as the Convention.

*Article 5. PARTICULARS IN THE CONSIGNMENT NOTE*

In addition to the particulars required by the CIM, the sender shall enter in the consignment note, in the column headed "Loading tackle—Containers", the category of the container, its marks, its number, its tare in kilogrammes and its capacity in cubic metres or litres.

The tare of containers shall not include the weight of special internal and removable fittings which are for the purpose of packing or securing.

*Article 6. PROVISION, RETURN AND HANDLING*

The tariffs or regulations shall determine the conditions under which containers will be supplied, the period within which they are to be returned, the charges which will be made for exceeding this period and the conditions under which the operations of loading and unloading are to be carried out.

"Loading" includes placing the container on a wagon and operations ancillary thereto, in particular the securing of the container.

*Article 7. CLEANING*

The consignee shall be responsible for cleaning containers after unloading. If containers are returned to the railway without having been cleaned, the railway shall be entitled to make a charge the amount of which shall be fixed by the tariffs or regulations.

*Article 8. RECONSIGNMENT*

Containers delivered loaded shall not be reconsigned by consignees on further journeys except with the consent of the railway which has so delivered them.

*Article 9. LOSS OF AND DAMAGE TO CONTAINERS*

1. Any person accepting a container, empty or loaded, from the railway shall check the condition of the container at the time it is placed at his disposal; he shall be liable for all damage found to exist on return of the container to the railway which was not indicated when the container was put at his disposal unless he proves that the damage existed at that time or resulted from circumstances which he could not avoid and the consequences of which he was unable to prevent.

2. The sender shall be liable for loss of or damage to a container arising during performance of the contract of carriage if it results from his actions or from those of persons acting on his behalf.

3. If the container is not returned within 30 days following the day on which it was put at the sender's disposal, the railway may deem it to be lost and demand payment of its value.

**CHAPTER III. PRIVATELY-OWNED CONTAINERS***Article 10. APPROVAL*

In order to be accepted for international traffic, privately-owned containers shall be approved by a railway to which the CIM applies, shall be provided by that railway with the distinguishing mark  $\square$  and shall comply with the conditions laid down for construction and marking.

*Article 11. SPECIAL EQUIPMENT*

If privately-owned containers are equipped with special apparatus (refrigerating equipment, water tanks, machinery, etc.), the sender shall be responsible for the servicing of such equipment or for arranging for this to be done. This duty shall pass to the consignee as soon as he exercises his rights under article 16 or 22 of the CIM.

*Article 12. PARTICULARS IN THE CONSIGNMENT NOTE*

1. In the case of loaded containers, in addition to the particulars required by the CIM, the sender shall enter in the consignment note, in the column headed "Loading tackle—Containers", the category of the container, its marks, its number, the sign [P], the tare of the container in kilogrammes and its capacity in cubic metres or litres.

2. In the case of empty containers, in addition to the particulars required by the CIM, the sender shall enter the following particulars in the consignment note:

- (a) In the column headed "Loading tackle—Containers": the category of the container, its marks, its number and the sign [P];
- (b) In the column headed "Description of goods": the tare in kilogrammes and the words "empty container".

*Article 13. RETURN OF EMPTY CONTAINERS OR RECONSIGNMENT*

After delivery of the container, and in the absence of special agreements, the railway shall not be bound to take any action to secure the return of the empty container or its reconsignment as a loaded container.

*Article 14. "CASH ON DELIVERY" CHARGES*

Empty containers shall not be consigned subject to "cash on delivery" charges.

*Article 15. LIABILITY FOR EXCEEDING THE TRANSIT PERIOD*

In regard to liability for exceeding the transit period railways may, apart from the provisions of the CIM, provide for the payment of special compensation to the owner of the container by special agreement with him.

## A N N E X I X

(Article 60 (3))

INTERNATIONAL REGULATIONS CONCERNING THE CARRIAGE  
OF EXPRESS PARCELS (RIEx)

1. Only such goods as are carried in a specially rapid manner subject to the conditions of an international tariff shall be deemed to be express parcels.

Goods shall only be accepted as express parcels if they can ordinarily be loaded into the luggage vans of passenger trains. The tariffs may provide for exceptions to this rule.

2. The goods referred to in article 3 of this Convention shall not be accepted for carriage. The substances and articles enumerated in annex I to this Convention or those covered by special agreements made under article 4 (2) of this Convention shall not be accepted for carriage as express parcels unless this form of carriage is expressly provided for in the said Annex or agreements. The tariffs shall determine whether other goods may also be excluded from carriage as express parcels or accepted subject to certain conditions.

3. Express parcels may be consigned under a document other than the consignment note prescribed in article 6 (1) of this Convention. The form to be used, and the particulars to be inserted therein, shall be determined by the tariff. In every case this document shall contain the following information:

- (a) The names of the forwarding and destination stations;
- (b) The name and address of the sender and of the consignee;
- (c) The number of parcels and a description of the packing and of the goods;
- (d) Particulars of the documents appended for the completion of formalities required by the Customs and other administrative authorities.

4. The sender shall be responsible for the accuracy of the statements and declarations entered in the transport document whether such entry is made by him or by the railway in accordance with information supplied by him; he shall be responsible for all the consequences resulting from any irregularity, incorrectness or incompleteness in the statements or declarations.

5. Express parcels shall be carried by rapid means within the periods prescribed in the tariffs. The transit periods shall in all cases be less than the periods applicable to *grande vitesse* traffic.

6. The tariffs may also provide for derogations from the provisions of this Convention other than those specified above: provided that there shall be no derogation from the provisions of articles 26, 27, 28, 29, 31, 32, 33 and 37 to 47 inclusive, of this Convention.

In so far as the foregoing provisions and those of the tariffs are not contrary thereto, the provisions of this Convention shall apply to the carriage of express parcels.

## A N N E X X

(Article 61)

### RULES FOR ARBITRATION

#### Article 1. NUMBER OF ARBITRATORS

Arbitration tribunals set up to deal with disputes other than those between States shall be composed of one, three or five arbitrators as the reference may determine.

#### Article 2. SELECTION OF ARBITRATORS

1. A panel of arbitrators shall be established. Each Contracting State may nominate not more than two of its nationals who are specialists in international transport law, for inclusion in the panel of arbitrators which shall be established and kept up to date by the Swiss Government.

2. If the reference provides for a sole arbitrator, he shall be selected by agreement between the parties.

If the reference provides for three or five arbitrators, each party shall select one or two arbitrators as the case may be.

The arbitrators so selected shall then select, by agreement, the third or fifth arbitrator, as the case may be, who shall be president of the arbitration tribunal.

If the parties cannot agree on the selection of a sole arbitrator or if the arbitrators nominated by the parties cannot agree on the nomination of the third or fifth arbitrator, as the case may be, the arbitration tribunal shall be completed by the appointment of an arbitrator nominated by the President of the Swiss Federal Tribunal at the request of the Central Office.

The arbitration tribunal shall be composed of persons drawn from the panel referred to in paragraph 1 above. Where, however, the reference provides for five arbitrators, each party may select one arbitrator who is not on the panel.

3. A sole arbitrator, or the third or fifth arbitrator, must be of a nationality other than that of either party.

The intervention in the dispute of a third party shall not affect in any way the composition of the arbitration tribunal.

#### *Article 3. REFERENCE*

The parties having recourse to arbitration shall draw up a reference which shall, in particular, specify:

- (a) The subject matter of the dispute set out as precisely and clearly as possible;
- (b) The composition of the tribunal and the period allowed for the nomination of the arbitrator or arbitrators;
- (c) The place where the tribunal is to sit.

The reference shall be sent to the Central Office before proceedings can be opened.

#### *Article 4. PROCEDURE*

The arbitration tribunal shall itself decide the procedure to be followed but, in particular, shall have regard to the following provisions:

- (a) The arbitration tribunal may only enquire into and determine matters referred to it on the basis of the material submitted by the parties, but this limitation shall not apply when the tribunal is called upon to decide a question of law;
- (b) The tribunal may not award more than the claimant has claimed or anything of a different nature, nor may it award less than the defendant has acknowledged as due;
- (c) The arbitration award, setting forth the reasons for the decision, shall be drawn up by the tribunal and notified to the parties through the Central Office;
- (d) Unless the law of the place where the tribunal is sitting otherwise provides, the arbitration award cannot be impeached except for the correction by the tribunal of any error on the face of the award or on grounds that the award is a nullity.

#### *Article 5. REGISTRAR*

The Central Office shall perform the duties of registrar to the arbitration tribunal.

#### *Article 6. COSTS*

The tribunal shall determine in its award the amount of costs and expenses, including the fees of the arbitrators, and which of the parties shall bear them or how they shall be apportioned between the parties.

RESERVATIONS AND DECLARATIONS  
MADE UPON ACCESSION

*FEDERAL REPUBLIC OF GERMANY*

[TRANSLATION — TRADUCTION]

The agreement of 17 December 1971 between the Government of the Federal Republic of Germany and the Government of the German Democratic Republic on transit traffic of civilians and goods between the Federal Republic of Germany and Berlin (West) and on documents for that purpose shall not be affected by participation in the aforementioned Conventions (CIM/CIV 1961).

*IRAQ*

“1) The Government of the Republic of Iraq declares that the international transportation movement of goods and passengers exchanged between Iraq, Lebanon, Syria and Turkey, shall not be subject to the two international Conventions for the transportation of goods and passengers, during the transition period, as the application of these conventions entails great technical difficulties. Therefore, the Government of the Republic of Iraq frankly declares that it will take all necessary steps to ensure that reasonable action will be taken for removing these technical difficulties, as soon as possible.

2) As paragraphs 17, 19 and 21 of the Convention for the transportation of goods by railways include financial text, it may raise some problems to the Iraqi railways, therefore, the text shall not apply on the Iraqi railways, at the present.

3) The accession of Iraq to these Conventions shall not include in any circumstances, the meaning of recognising Israel nor entering with it in any transactions organised by these conventions.”

*IRELAND*

“(1) The CIM and CIV Conventions shall not apply to traffic of passengers, luggage or goods exchanged between Ireland and the United Kingdom.

(2) The special conditions regarding the United Kingdom, as laid down in paragraphs 1, 2 and 3 of Part II of the Additional Protocol of 25th February, 1961, shall likewise apply to Ireland.”

*SYRIAN ARAB REPUBLIC*

[TRANSLATION — TRADUCTION]

The Government of the Syrian Arab Republic declares that, during a transitional period, international traffic of passengers and goods exchanged exclusively between Iraq, Lebanon, Syria and Turkey shall not be subject to the provisions of the CIM and CIV international conventions because of the substantial technical difficulties to which application of those provisions would give rise. The Government of the Syrian Arab Republic states that it will take the necessary steps to ensure that measures for removing the difficulties are put into effect as soon as possible.

[OFFICIAL ENGLISH TRANSLATION<sup>1</sup> — TRADUCTION ANGLAISE OFFICIELLE<sup>2</sup>]

AMENDMENTS<sup>3</sup> TO THE INTERNATIONAL CONVENTION  
CONCERNING THE CARRIAGE OF GOODS BY RAIL (CIM)  
DONE AT BERNE, 25 FEBRUARY 1961,<sup>4</sup> MADE IN ACCORD-  
ANCE WITH THE DECISIONS OF THE REVISION COMMIT-  
TEE AT THE SESSION OF NOVEMBER 1967 [AT BERNE]

I. *Article 6 of C.I.M.* 1. Paragraph 1, last sub-paragraph, shall be worded as follows:

“The consignment note shall be printed on substantial white writing-paper; when relating to *grande vitesse* each sheet shall bear two red borders, one on the top edge and the other on the bottom edge both back and front.”

2. Paragraph 3 shall read as follows:

“Those parts of the form to the left of the thick line shall be completed by the sender and the other parts by the railway.”

3. Paragraph 6 shall read as follows:

“The consignment note shall contain the following particulars:

- (a) The name of the destination station, with the information necessary to avoid any confusion between different stations serving the same locality or localities of the same or similar names;
- (b) The name and address of the consignee. Only one individual, firm or corporate body shall be shown as consignee. It shall only be permissible to consign to the destination station or to a railway official at the destination station if the tariff applicable expressly permits this to be done. Addresses not indicating the name of the consignee, such as “to the order of . . . . .” or “to the holder of the consignment note duplicate” are not allowed;
- (c) A description of the goods, an indication of the weight or, failing that, a similar indication, in accordance with the regulations of the forwarding railway. Where the laws or regulations of the country of departure authorise the sender to consign his goods without mention of the weight or information in lieu thereof, such weight or information shall be entered by the forwarding railway.

The goods shall be described as follows: those specified in Annex 1 to this Convention, by the name given to them in that Annex; other goods, where the sender requests the application of a particular tariff, by the name given to them in that tariff; and in all other cases by the ordinary commercial description, according to their nature, given to the goods in the country of departure;

<sup>1</sup> Translation supplied by the Government of the United Kingdom.

<sup>2</sup> Traduction fournie par le Gouvernement du Royaume-Uni.

<sup>3</sup> The amendments were adopted by a Procès-Verbal on 22 November 1967 by the Revision Committee which met at Berne from 20 to 22 November 1967, in accordance with the provisions of annex I of the Convention, and took effect on 1 January 1969.

<sup>4</sup> See p. 5 of this volume.

- (d) In the case of traffic in less than wagon loads: the number of packages; their individual marks and numbers, or, in their absence, a statement that the packages bear the address of the consignee; a description of the packing. Such information shall also be shown in any consignment note relating to complete wagon loads which comprise one or more articles or packages forwarded by rail—sea and which require to be transhipped.

In the case of consignments where the loading is the duty of the sender: the wagon number and also, for privately owned wagons, the tare;

- (e) A detailed list of the documents which are required by the Customs and other administrative authorities and which are attached to the consignment note or shown as held at the disposal of the railway at a named station or at the office of the Customs or of any other authority;
- (f) The name and address of the sender and, should he consider it desirable, his telegraphic address or telephone number. Only one individual, firm or corporate body shall be shown on the consignment note as sender. If the laws or regulations in force at the forwarding station so require, the sender shall add to his name and address his written, printed, or stamped signature; to this end, the form of consignment note used may include the indication "signature".

4. Paragraph 7 (e) shall be worded as follows:

"(e) The amount of 'cash on delivery' charges, and of disbursements, in figures (article 19 of this Convention)."

II. *Article 17 of C.I.M.* Paragraph 2 shall read as follows:

"2. A sender who undertakes to pay a part or all of the charges shall indicate this in the space on the consignment note for 'prepayment instructions' by marking a cross against one of the printed instructions, together with any additional information as appropriate:

- (a) 1. 'Carriage charges paid', if he undertakes to pay carriage charges only;
2. 'Carriage charges and . . . . . paid', if he undertakes to pay charges additional to those for carriage; in which case he shall give an exact description of those charges; the additions which may relate only to supplementary charges or other charges incurred from the time of acceptance for carriage to the time of delivery, and to sums collected either by the Customs or by other administrative authorities, shall not result in any division of the total amount of any one category of charges (for example the total amount of Customs duties payable and other amounts collected by the Customs authorities);
3. 'Carriage charges paid to X' (X indicating by name the point at which the tariffs applied by adjacent countries take effect), if he undertakes to pay the charges for carriage to X;
4. 'Carriage charges and . . . . . paid to X' (X indicating by name the point at which the tariffs applied by adjacent countries take effect), if he undertakes to pay charges additional to those for carriage to X, but excluding all charges relating to the subsequent country or railway. The sender shall give an exact description of



those charges; the additions which may relate only to supplementary charges or other charges incurred from the time of acceptance for carriage to X, and to sums collected either by the Customs or by other administrative authorities, shall not result in any division of the total amount of any one category of charges (for example the total amount of Customs duties payable and other amounts collected by the Customs authorities);

- (b) 'All charges paid', if he undertakes to pay all charges of every kind (carriage charges, supplementary charges, Customs duties and other charges);
- (c) 'Charges not exceeding . . . . . (specified amount) paid', if he undertakes to pay a fixed amount. Except when provision is made to the contrary in the tariffs, this amount shall be expressed in the currency of the forwarding country.

Supplementary charges and other charges which, according to the regulations and internal tariffs of the forwarding country or, as the case may be, according to the rates of the international tariff which has been applied, are to be calculated for the whole of the route over which the charges apply, and the charge for interest in delivery laid down in article 20 (2) of this Convention, shall always be paid in full by the sender in the case of payment of the charges in accordance with (a) 4."

III. The model consignment note (Annex II of C.I.M.) is replaced by the new version attached.<sup>1</sup>

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<sup>1</sup> For technical reasons, it has been decided not to publish here the sheets containing forms provided for in article 6 (1). However, they are annexed to the original registered with the Secretariat of the United Nations.

## [TRANSLATION — TRADUCTION]

AMENDMENTS<sup>1</sup> TO THE TEXT OF ANNEX I (INTERNATIONAL REGULATIONS CONCERNING THE CARRIAGE OF DANGEROUS GOODS BY RAIL (RID)) TO THE INTERNATIONAL CONVENTION CONCERNING THE CARRIAGE OF GOODS BY RAIL (CIM) OF 25 FEBRUARY 1961<sup>2</sup>

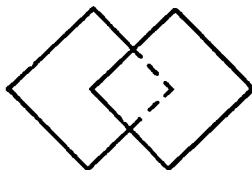
## PART I. GENERAL REGULATIONS

- 2 In paragraph (1), the text concerning Appendix V is amended to read:

Appendix V, regulations relating to tests on the metal drums referred to in marginals 303 (6) and 513 (1) (c);

- 10 A new marginal 10 reading as follows is added:

Compliance with the prohibitions on mixed loading prescribed under section E of each Class is based on the danger labels of Appendix IX, which must be affixed to the packages in conformity with the regulations under A.4 of the respective Class. When a package must bear two labels of the same model, these shall be affixed in the manner shown below:



- 11 A new marginal 11 reading as follows is added:

(1) Except where there are regulations to the contrary in the various Classes, packages may be loaded:

- (a) In covered wagons; or
- (b) In sheeted open wagons; or
- (c) In open wagons (unsheeted).

(2) Packages whose packagings are made of materials sensitive to moisture shall be loaded in covered or sheeted open wagons.

- 12 A new marginal 12 reading as follows is added:

Substances and articles of RID, except those which are handed over for carriage as express parcels (*colis express*), may not be forwarded otherwise than in goods trains.

<sup>1</sup> The amendments were adopted by the XVIIIth session of the Committee of experts established under Annex VI to the Convention, in accordance with article 69 (4) of the said Convention, and took effect on 1 July 1973.

<sup>2</sup> See p. 5 of this volume.

## PART II. REGULATIONS RELATING TO THE VARIOUS CLASSES

## CLASS I a. EXPLOSIVE SUBSTANCES AND ARTICLES

37 Paragraph 1: new wording:

(1) Packages containing substances and articles of Class I a shall bear a label conforming to model No. 1.

40 Paragraphs 1 and 2: new wording:

(1) Substances and articles of Class I a shall be loaded in covered wagons.

(2) Only wagons fitted with roller-bearing axle boxes, sheet-steel sparkguards in accordance with the regulations—which shall not be fixed directly on to the floor of the wagon—, spring buffers and spring draw-gear, with solid and secure roofing without cracks, with a floor without cracks, with tightly closing doors and ventilator shutters may be used for the carriage of substances and articles of Class I a in full wagon loads. No iron objects in the interior of the wagon other than those forming part of the construction of the wagon shall be allowed to protrude. Before loading, the floor of the wagon shall be carefully cleaned by the sender, and cleared specifically of all combustible waste (straw, hay, paper, etc.). The doors and ventilator shutters of the wagons shall be kept closed.

44 This marginal now reads:

Substances and articles of Class I a must not be loaded in the same wagon together:

- (a) With articles of Class I b (marg. 61) contained in packages bearing two labels conforming to model No. 1;
- (b) With packages bearing a label conforming to models Nos. 2 D, 4, 4 A, 6 A, 6 B or 6 C;
- (c) With packages bearing one or two labels conforming to models Nos. 2 A, 2 B, 2 C, 3 or 5.

## CLASS I b. ARTICLES FILLED WITH EXPLOSIVE SUBSTANCES

75 This marginal now reads:

Packages containing articles of Class I b shall bear a label conforming to model No. 1. Packages containing articles of items 1 (d), 5 and 6 shall, however, bear two labels conforming to model No. 1 (see marg. 10).

76 Paragraph 1: new wording:

(1) Articles of items 10 and 11 may not be forwarded otherwise than in full wagon loads.

78 This marginal now reads:

(1) Articles of Class I b shall be loaded in covered wagons.

(2) Only wagons fitted with roller-bearing axle boxes, sheet-steel sparkguards in accordance with the regulations—which shall not be fixed

directly on to the floor of the wagon—, spring buffers and spring draw-gear, with solid and secure roofing without cracks, with a floor without cracks, with tightly closing doors and ventilator shutters may be used for the carriage of articles of Class I b in full wagon loads. No iron objects in the interior of the wagon other than those forming part of the construction of the wagon shall be allowed to protrude. Before loading, the floor of the wagon shall be carefully cleaned by the sender, and cleared specifically of all combustible waste (straw, hay, paper, etc.). The doors and ventilator shutters of the wagons shall be kept closed.

(3) Text of existing (2).

(4) Text of existing (5).

(5) Text of existing (6).

80 Paragraph (2): new wording:

(2) Small containers shall be labelled in conformity with marg. 75.

81 This marginal now reads:

(1) Articles of Class I b contained in packages bearing a label conforming to model No. 1 must not be loaded in the same wagon together:

(a) With articles of Class I b (marg. 61) contained in packages bearing two labels conforming to model No. 1;

(b) With packages bearing a label conforming to models Nos. 2 D, 4, 4 A, 6 A, 6 B or 6 C;

(c) With packages bearing one or two labels conforming to models Nos. 2 A, 2 B, 2 C, 3 or 5.

(2) Articles of Class I b contained in packages bearing two labels conforming to model No. 1 must not be loaded in the same wagon together:

(a) With substances and articles of Classes I a (marg. 21), I b (marg. 61) and 1 c (marg. 101) contained in packages bearing a label conforming to model No. 1;

(b) With the packages specified under (1) (b) and (c) above.

#### CLASS I c. IGNITERS, FIREWORKS AND SIMILAR GOODS

112 This marginal now reads:

(1) Packages containing articles of items 16 and 21 to 23 shall bear a label conforming to model No. 1.

(2) Packages containing fragile receptacles not visible from the outside shall bear a label conforming to model No. 9.

117 This marginal now reads:

(1) Wagons in which packages containing articles of items 16 and 21 to 23 are loaded shall bear on both sides labels conforming to model No. 1.

(2) Small containers shall be labelled in conformity with marg. 112.

Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

**118** This marginal now reads:

Articles of Class I c contained in packages bearing a label conforming to model No. 1 must not be loaded in the same wagon together:

- (a) With articles of Class I b (marg. 61) contained in packages bearing two labels conforming to model No. 1;
- (b) With packages bearing a label conforming to models Nos. 2 D, 4, 4 A, 6 A, 6 B or 6 C;
- (c) With packages bearing one or two labels conforming to models Nos. 2 A, 2 B, 2 C, 3 or 5.

CLASS I d. GASES: COMPRESSED, LIQUEFIED OR DISSOLVED  
UNDER PRESSURE

**154** In paragraph (3), "model No. 2" is replaced by "model No. 2 A".

**157** This marginal now reads:

From April to October inclusive open wagons shall be protected by sheets.

**159** Paragraph (2) (a) 10.: new wording:

- 10. By derogation from the regulations of marg. 146 (3), the periodic inspections shall be repeated:
  - i. In the case of receptacles intended for the carriage of town gas [item 1 (b)], boron trifluoride [item 3], hydrogen bromide, hydrogen fluoride, hydrogen sulphide, chlorine, sulphur dioxide, nitrogen dioxide (item 5), phosgene [item 8 (a)], and hydrogen chloride, anhydrous (item 10): every 4 years;
  - ii. In the case of receptacles intended for the carriage of the other compressed and liquefied gases and also for ammonia dissolved under pressure (item 14): at the end of a period equal to double the period laid down for the review of the wagon which is carrying the receptacle, such a period not to exceed 8 years. The fittings shall be examined at the time of each periodic review, but at the latest after four years.

**164** Paragraphs (2) and (3): new wording:

(2) Wagons in which packages containing articles of items 16 (b) and 17 (a) are loaded shall bear on both sides labels conforming to model No. 2 A.

(3) Small containers shall be labelled in conformity with marg. 154 (3).

**165** This marginal now reads:

Articles of Class I d contained in packages bearing a label conforming to model No. 2 A must not be loaded in the same wagon together with

substances and articles of Classes I a (marg. 21), I b (marg. 61) and I c (marg. 101) contained in packages bearing one or two labels conforming to model No. 1.

CLASS I e. SUBSTANCES WHICH GIVE OFF INFLAMMABLE GASES  
ON CONTACT WITH WATER

188 In paragraph (1), “a label conforming to model No. 7” is replaced by “a label conforming to model No. 2 D and a label conforming to model No. 7”.

In paragraph (2), “model No. 2” is replaced by “model No. 2 A”.

195 Paragraph (2) is replaced by the following paragraphs (2) and (3):

(2) Wagons in which substances of this Class are loaded shall bear on both sides labels conforming to model No. 2 D. Wagons in which packages containing trichlorosilane of item 4 are loaded shall bear in addition a label conforming to model No. 2 A.

(3) Small containers shall be labelled in conformity with marg. 188 (1) and (2).

Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

196 This marginal now reads:

Substances of Class I e must not be loaded in the same wagon together with substances and articles of Classes I a (marg. 21), I b (marg. 61) and I c (marg. 101) contained in packages bearing one or two labels conforming to model No. 1.

CLASS II. SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION

213 Paragraph (1): new wording:

(1) Packages containing substances of items 1 to 4 and 6 shall bear a label conforming to model No. 2 C.

If the substances of item 4 are packed in drums made of impermeable fibre-board in conformity with marg. 206 (1), the packages shall, however, bear two labels conforming to model No. 2 C (see marg. 10).

In paragraph (4), “label No. 2” is replaced by “a label conforming to model No. 2 C”.

214 This marginal now reads:

No restrictions in respect of *grande vitesse* and *petite vitesse*.

216 This marginal now reads:

Packages containing substances of items 4 and 10 shall be loaded in covered wagons or sheeted open wagons.

220 In paragraph (1), “model No. 2” is twice replaced by “model No. 2 C”

Paragraph (2): new wording:

(2) Small containers shall be labelled in conformity with marg. 213 (1).

Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

221 This marginal now reads:

(1) Substances of Class II contained in packages bearing one or two labels conforming to model No. 2 C must not be loaded in the same wagon together with substances and articles of Classes I a (marg. 21), I b (marg. 61) and I c (marg. 101) contained in packages bearing one or two labels conforming to model No. 1.

(2) Substances of item 4 contained in packages bearing two labels conforming to model No. 2 C must not be loaded in the same wagon together:

(a) With substances of Classes III c (marg. 371) and VII (marg. 701) contained in packages bearing two labels conforming to model No. 3;

(b) With liquid substances of Class V (marg. 501) contained in packages bearing two labels conforming to model No. 5.

#### CLASS III a. INFLAMMABLE LIQUIDS

303 Paragraph 6, second subparagraph: new wording:

The body joints of the drums must be welded and the end joints welded or double-seamed by welting. The drums must be fitted with rolling hoops or reinforcing ribs. Each drum must have undergone the leakage test laid down in Appendix V. The drums must be of a type of construction which has withstood the other tests laid down in Appendix V and shall bear the mark given when the construction type was approved.

304 Paragraph (1), third subparagraph, last sentence: new wording:

If the packages are loaded in an open wagon, the protective cover must be incapable of igniting on contact with a flame.

307 Paragraph (1): new wording:

(1) Packages containing liquids of items 1 to 3 and 5 shall bear a label conforming to model No. 2 A.

If substances of items 2, 3 and 5 are packed in receptacles made of glass, porcelain, stoneware or similar materials with a capacity of more than 5 litres, the packages shall, however, bear two labels conforming to model No. 2 A (see marg. 10).

Packages containing acrylaldehyde or chloroprene (chlorobutadiene) [item 1 (a)] shall bear in addition a label conforming to model No. 4.

In paragraph (4), the words "labels Nos. 2 and 4" are replaced by "labels conforming to models Nos. 2 A and 4".

308 This marginal now reads:

No restrictions in respect of *grande vitesse* and *petite vitesse*.

309 Paragraph (2) is deleted.

310 Paragraphs (1) and (2) are deleted.

**311** Paragraph 5, penultimate subparagraph: new wording:

The hydraulic-pressure test and the internal examination shall be repeated at the end of a period equal to double the period laid down for the review of the wagon which is carrying the receptacle, such a period not to exceed 8 years. The fittings shall be examined at the time of each periodic review, but at the latest after four years.

**313** Paragraphs 1 and 3: new wording:

(1) Wagons in which substances of items 1 to 3 and 5 are loaded shall bear on both sides labels conforming to model No. 2 A. In addition, these wagons shall bear on both sides labels conforming to model No. 10. Tank wagons containing substances mentioned above shall also bear on both sides labels conforming to models Nos. 2 A and 10. Wagons and tank wagons in which acrylaldehyde or chloroprene (chlorobutadiene) [item 1 (a)] are loaded shall, in addition, bear on both sides labels conforming to model No. 4.

(3) Small containers and small tank containers shall be labelled in conformity with marg. 307 (1) and (2).

Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

**314** This marginal now reads:

(1) Liquids of Class III a contained in packages bearing one or two labels conforming to model No. 2 A must not be loaded in the same wagon together with substances and articles of Classes I a (marg. 21), I b (marg. 61) and I c (marg. 101) contained in packages bearing one or two labels conforming to model No. 1.

(2) Liquids of Class III a contained in packages bearing two labels conforming to model No. 2 A must not be loaded in the same wagon together:

- (a) With substances of Classes III c (marg. 371) and VII (marg. 701) contained in packages bearing two labels conforming to model No. 3;
- (b) With liquid substances of Class V (marg. 501) contained in packages bearing two labels conforming to model No. 5.

CLASS III b. INFLAMMABLE SOLIDS

**333** Paragraph (1) is deleted.

**336** Paragraphs (2) and (3) are deleted.

**337** At the end of paragraph (1), the words “in the case of *grande vitesse* consignments in less than full wagon loads, only wooden packagings are to be accepted” are deleted.

**344** Paragraph (1): new wording:

(1) Packages containing substances of items 4 to 8 shall bear a label conforming to model No. 2 B.

If substances of items 4 to 7 are packed in wrappings made of closely woven fabric in conformity with marg. 335 (1) (b) 3., in fibreboard



boxes or cases in conformity with marg. 336 (1) and 338 (4) (b), in jute bags in conformity with marg. 337 (1) or in fibreboard drums in conformity with marg. 338 (1) (a), (2) and (4) (b), the packages shall, however, bear two labels conforming to model No. 2 B (see marg. 10).

In paragraph (3), "label No. 2" is replaced by "a label conforming to model No. 2 B".

345 This marginal now reads:

Developed celluloid films (item 5) may be forwarded as express parcels if they are packed in boxes made of wood, tin plate or thin aluminium sheet, or in hardened fibreboard and then placed in wooden cases with complete walls, and if the sender certifies this method of packing in the consignment note with the words "*Packed for express parcels*"; in this case a package must not weigh more than 50 kg.

346 Paragraph (2) is deleted.

347 Paragraph (1): new wording:

(1) Substances of items 4 to 8 shall be loaded in covered wagons or sheeted open wagons.

351 In paragraph (1), "model No. 2" is replaced by "model No. 2 B".

Paragraph (2): new wording:

(2) Small containers shall be labelled in conformity with marg. 344 (1).

Small containers enclosing packages bearing a label conforming to model No. 9 shall also bear this label.

352 This marginal now reads:

(1) Substances of Class III b contained in packages bearing one or two labels conforming to model No. 2 B must not be loaded in the same wagon together with substances and articles of Classes I a (marg. 21), I b (marg. 61) and I c (marg. 101) contained in packages bearing one or two labels conforming to model No. 1.

(2) Substances of Class III b contained in packages bearing two labels conforming to model No. 2 B must not be loaded in the same wagon together:

(a) With substances of Classes III c (marg. 371) and VII (marg. 701) contained in packages bearing two labels conforming to model No. 3;

(b) With liquid substances of Class V (marg. 501) contained in packages bearing two labels conforming to model No. 5.

#### CLASS III c. OXIDISING SUBSTANCES

381 Paragraph (1): new wording:

(1) Packages containing substances of Class III c shall bear a label conforming to model No. 3. Packages containing substances of items 1 to 5 and 8 to 10 shall, however, bear two labels conforming to model No. 3 (see marg. 10).

Packages containing substances of item 3 shall bear in addition a label conforming to model No. 5.

**382** This marginal now reads:

No restrictions in respect of *grande vitesse* and *petite vitesse*.

**384** Paragraph (6) is deleted.

**388** Paragraphs (2), (3) and (4) are replaced by the following paragraphs (2) and (3):

(2) Small containers and small tank containers shall be labelled in conformity with marg. 381 (1).

(3) Small containers enclosing packages bearing a label conforming to model No. 9 shall also bear this label.

**389** This marginal now reads:

(1) Substances of Class III c contained in packages bearing one or two labels conforming to model No. 3 must not be loaded in the same wagon together with substances and articles of Classes I a (marg. 21), I b (marg. 61) and I c (marg. 101) contained in packages bearing one or two labels conforming to model No. 1.

(2) Substances of Class III c contained in packages bearing two labels conforming to model No. 3 must not be loaded in the same wagon together:

(a) With substances of Classes II (marg. 201), III a (marg. 301) and III b (marg. 331) contained in packages bearing two labels conforming to models Nos. 2 A, 2 B or 2 C;

(b) With liquids of Class V (marg. 501) contained in packages bearing two labels conforming to model No. 5.

#### CLASS IV a. POISONOUS SUBSTANCES

**432** In paragraph (1), “model No. 2” is replaced by “model No. 2 A”.

In paragraph (3), the words “labels Nos. 2, 4 or 4 A” are replaced by “labels conforming to models Nos. 2 A, 4 or 4 A”.

**433** Paragraph (1) is deleted.

**435** Paragraphs (1) and (3) are deleted.

In paragraph (2), the first sentence is deleted.

**440** In paragraph (1), “model No. 2” is replaced by “model No. 2 A”.

**441** This marginal now reads:

Substances of Class IV a contained in packages bearing a label conforming to models Nos. 2 A, 4 or 4 A must not be loaded in the same wagon together with substances and articles of Classes I a (marg. 21), I b (marg. 61) and I c (marg. 101) contained in packages bearing one or two labels conforming to model No. 1.

## CLASS IV b. RADIOACTIVE SUBSTANCES

467 This marginal now reads:

Substances of Class IV b contained in packages bearing a label conforming to models Nos. 6 A, 6 B or 6 C must not be loaded in the same wagon together with substances and articles of Classes I a (marg. 21), I b (marg. 61) and I c (marg. 101) contained in packages bearing one or two labels conforming to model No. 1.

## CLASS V. CORROSIVE SUBSTANCES

513 Does not apply to the English text.

524 Paragraph (1): new wording:

(1) Packages containing substances of items 1 to 7, 9, 11, 12, 14, 15, 22, 31 to 35 and 41 (a) shall bear a label conforming to model No. 5.

If liquid substances of items 1 (a) to (e), 2 to 5, 11, 22 and 32 are packed in receptacles made of glass, porcelain, stoneware or similar materials with a capacity of more than 5 litres, the packages shall, however, bear two labels conforming to model No. 5 (see marg. 10).

In paragraph (3), the words "which, under the provisions of marg. 527 (2), may be loaded in covered wagons" are deleted.

525 Paragraph (1) is deleted.

527 Paragraphs (1) and (2) are deleted.

532 Paragraph (2): new wording:

(2) Small containers and small tank containers shall be labelled in conformity with marg. 524 (1).

Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

533 This marginal now reads:

(1) Substances of Class V contained in packages bearing one or two labels conforming to model No. 5 must not be loaded in the same wagon together with substances and articles of Classes I a (marg. 21), I b (marg. 61) and I c (marg. 101) contained in packages bearing one or two labels conforming to model No. 1.

(2) Liquids of Class V contained in packages bearing two labels conforming to model No. 5 must not be loaded in the same wagon together:

(a) With substances of Classes II (marg. 201), III a (marg. 301) and III b (marg. 331) contained in packages bearing two labels conforming to models Nos. 2 A, 2 B or 2 C;

(b) With substances of Classes III c (marg. 371) and VII (marg. 701) contained in packages bearing two labels conforming to model No. 3.

CLASS VI. REPUGNANT SUBSTANCES AND SUBSTANCES  
LIABLE TO CAUSE INFECTION

609 In paragraph (1), the words “if forwarded either in less than full wagon loads by *petite vitesse* or in full wagon loads” are deleted.

Paragraph (2): new wording:

(2) For consignments forwarded as express parcels:

(a) Substances of item 8 (a) shall be packed in receptacles made of glass, porcelain, stoneware, metal or a suitable plastics material. These receptacles shall be placed, either singly or in groups, in a strong wooden case, with absorbent cushioning material if the receptacles are fragile. If the substances to be carried are immersed in a preserving fluid, the absorbent material shall be sufficient in quantity to absorb all the fluid. The preserving fluid must not be inflammable;

(b) Substances of item 8 (b) shall be packed in suitable receptacles placed with cushioning material in a strong wooden case having a metal lining rendered leakproof, e.g. by soldering.

615 This marginal now reads:

(1) Substances of items 9 and 10 may not be forwarded otherwise than in full wagon loads.

(2) Substances of items 7 and 8 may be forwarded as express parcels on condition that the weight of a package does not exceed 40 kg and their packaging is in conformity with the regulations of marg. 609 (2).

617 This marginal is deleted.

621 This marginal now reads:

With the exception of substances of items 7 and 8 forwarded as express parcels, substances of Class VI must not be loaded in the same wagon together with foodstuffs or other articles for consumption.

623 Paragraph (2): new wording:

(2) Articles of item 12 must not be loaded in the same wagon together with foodstuffs or other articles for consumption.

626 This marginal now reads:

With the exception of substances of item 7 and those of item 8 forwarded as express parcels, substances of Class VI must be kept apart in goods depots from foodstuffs or other articles for consumption.

CLASS VII. ORGANIC PEROXIDES

711 Paragraph (1): new wording:

(1) Packages containing substances of Class VII shall bear two labels conforming to model No. 3 (see marg. 10).

712 This marginal now reads:

No restrictions in respect of *grande vitesse* and *petite vitesse*.

- 714** Paragraph (1): new wording:  
 (1) Substances of items 1 to 22, 30 and 31 shall be loaded in covered wagons.
- 717** In paragraph (1), “model No. 2” is replaced by “model No. 3”.  
 Paragraph (2): new wording:  
 (2) Small containers shall be labelled in conformity with marg. 711 (1).  
 Small containers enclosing packages bearing a label conforming to model No. 9 shall also bear this label.
- 718** This marginal now reads:  
 Substances of Class VII must not be loaded in the same wagon together:  
 (a) With substances and articles of Classes I a (marg. 21), I b (marg. 61) and I c (marg. 101) contained in packages bearing one or two labels conforming to model No. 1;  
 (b) With substances of Classes II (marg. 201), III a (marg. 301), and III b (marg. 331) contained in packages bearing two labels conforming to models Nos. 2 A, 2 B or 2 C;  
 (c) With liquid substances of Class V (marg. 501) contained in packages bearing two labels conforming to model No. 5.

#### APPENDIX V

Appendix V is replaced by the following text:

##### REGULATIONS RELATING TO TESTS ON THE METAL DRUMS REFERRED TO IN MARGINALS 303 (6) AND 513 (1) (c)

###### I. *Hydraulic-pressure test*

- 1500** This test must be carried out by an approved body.  
*Number of samples*  
 Three drums of each type of construction and from each manufacturer.  
*Test procedure and pressure to be applied*  
 The drums must be subjected to a hydraulic-gauge pressure of not less than 0.75 kg/cm<sup>2</sup> for five minutes during which time the pressure must remain constant. The drums must not be mechanically supported during the test.  
*Criteria for passing test satisfactorily*  
 The drums must remain watertight.

###### II. *Drop test*

- 1501** This test must be carried out by an approved body.  
*Number of samples*  
 Six drums of each type of construction and from each manufacturer.

*Preparation of packages for testing*

The drums must be filled to 98% of their capacity.

*Target*

The target must be a rigid, even, flat and horizontal surface.

*Height of drop*

—If the test is carried out with water:

- (a) Where the liquids to be carried have a specific gravity not exceeding 1.2 : 1.20 m;
- (b) Where the liquids to be carried have a specific gravity exceeding 1.2 : a height in metres equal to the specific gravity of the liquid to be carried rounded upwards to the first decimal;

—If the test is carried out with the liquid to be carried, or with a liquid whose specific gravity is at least equal to that of the liquid to be carried: 1.20 m.

*Point of impact*

The test must comprise drops of two kinds:

*First drop* (using three drums): the drum must strike the target diagonally on the chime or, if the drum has no chime, on a circumferential seam. When dropped, the drum shall be so suspended that its centre of gravity is vertically above the point of impact;

*Second drop* (using the three other drums): the drum must strike the target horizontally on the welded longitudinal seam of the drum body.

*Criteria for passing test satisfactorily*

After the drop, all drums must be leakproof when equilibrium between the external and the internal pressure has been restored.

If a drum is not leakproof, twelve new drums must be subjected to new tests. None of these drums must show any leakage after the tests.

If more than one in the first batch of six drums is not leakproof, the type of drum in question shall be rejected.

### III. *Leakage test*

1502

Every drum must undergo the test:

- (a) Before being used in transport for the first time,
- (b) After being reconditioned before being used again in transport.

*Test procedure*

The drum shall be immersed in water; the manner of maintaining the drum under water shall not affect the validity of the test. Alternatively, the drum may be covered on its seams, or any other place where leakage could occur, with a soap solution, heavy oil or other suitable liquid. Other methods at least as effective, such as their air pressure differential test (“air-pocket tester”), may also be used.

*Air pressure to be applied*

The pressure must not be less than 0.2 kg/cm<sup>2</sup>.

*Criteria for passing test satisfactorily*

There must be no escape of air.

1502 and 1503 become 1503 and 1504.

- 1503 In the third line, “RID, III a” is replaced by “RID”.  
Subheadings III and IV are renumbered IV and V respectively.

## APPENDIX IX

Appendix IX is replaced by the following text:

### 1. Regulations relating to danger labels

- 1900 (1) For packages, labels Nos. 1, 2 A, 2 B, 2 C, 2 D, 3, 4, 5, 6 A, 6 B and 6 C shall take the form of a diamond-shaped square each side of which measures 100 mm.

For wagons, labels Nos. 1, 2 A, 2 B, 2 C, 2 D, 3, 4, 5, and 6 D shall take the form of a diamond-shaped square each side of which measures at least 150 mm.

(2) Labels Nos. 4 A, 7, 8 and 9 shall have a standard rectangular A 5 format (148 × 210 mm). The dimensions of the labels to be affixed to packages may be reduced to a format not smaller than A 7 (74 × 105 mm).

(3) Label No. 10 shall have the shape of a triangle of which the base measures at least 100 mm and the height at least 70 mm.

- 1901 (1) Danger labels must be stuck on packages, wagons and small containers or affixed in some other suitable manner. Only where the external state of a package does not allow this should they be stuck on cards or tablets securely attached to the package. On outer packagings, private wagons and small containers, indelible danger markings corresponding exactly to the prescribed models may be used instead of labels.

(2) It is incumbent on the sender to affix the labels:

- (a) To packages, whether handed over for carriage in full or less than full wagon loads;
- (b) To all containers;
- (c) To wagons carrying full wagon loads;
- (d) To wagons containing packages loaded by the sender.

(3) In all other cases, it is incumbent on the railway to label the wagons.

### 2. Explanation of the diagrams

- 1902 The danger labels prescribed for substances and articles of Classes I to VII (see diagrams on page 358) signify:

No. 1 (*black bomb on orange background*): danger of explosion;  
prescribed in marg. 37 (1), 43 (1) and (2), 75, 80 (1) and (2), 112 (1), 117 (1) and (2);

for prohibitions on mixed loading, see marg. 42, 44, 79, 81, 116, 118;

No. 2 A (*black flame on red background*): danger of fire (inflammable liquids);  
prescribed in marg. 154 (3), 164 (2) and (3), 188 (2), 195 (2) and (3), 307 (1), 313 (1) and (3), 432 (1), 440 (1);

for prohibitions on mixed loading, see marg. 163, 165, 194, 196, 312, 314, 439, 441;

- No. 2 B (*black flame on background consisting of equidistant vertical stripes alternately red and white*): danger of fire (inflammable solids);  
prescribed in marg. 344 (1), 351 (1) and (2);  
for prohibitions on mixed loading, see marg. 350, 352;
- No. 2 C (*black flame on white background, the lower half of the label being red*): spontaneously combustible;  
prescribed in marg. 213 (1), 220 (1) and (2);  
for prohibitions on mixed loading, see marg. 219, 221;
- No. 2 D (*black flame on blue background*): danger of release of inflammable gases on contact with water;  
prescribed in marg. 188 (1), 195 (2) and (3);  
for prohibitions on mixed loading, see marg. 194, 196;
- No. 3 (*flame above a circle, black on yellow background*): oxidising substances or organic peroxides;  
prescribed in marg. 381 (1), 388 (1) and (2), 711 (1), 717 (1) and (2);  
for prohibitions on mixed loading, see marg. 387, 389, 716, 718;
- No. 4 (*skull and cross bones, black on white background*): poisonous substance; to be kept apart in wagons and goods depots from foodstuffs or other articles for consumption;  
prescribed in marg. 307 (1) and (2), 313 (1), (2) and (3), 316 (3), 432 (1), 440 (1) and (2), 443 (3);  
for prohibitions on mixed loading, see marg. 439, 441;
- No. 4 A (*St. Andrew's Cross, black on orange background, without frame*): harmful substance;  
prescribed in marg. 432 (1), 440 (1) and (2), 443 (3);  
for prohibitions on mixed loading, see marg. 439, 441;
- No. 5 (*drops falling from one test tube on to a plate and from another test tube on to a hand; black on white background, the lower half of the label being black with a white border*): corrosive substance;  
prescribed in marg. 381 (1), 388 (2), 524 (1), 532 (1) and (2), 535 (3);  
for prohibitions on mixed loading, see marg. 530, 533;
- No. 6 A (*stylised trefoil, inscription RADIOACTIVE, a vertical stripe in the lower half, with the following text. \*): Contents . . . Activity . . . black symbol and words on white background, vertical red stripe: radioactive substance in packages of Category I-WHITE; in the event of damage to packages, danger to health by ingestion or inhalation of, or contact with spilt contents*;  
prescribed in marg. 459 (1), 466 (2);  
for prohibitions on mixed loading, see marg. 465, 467;
- No. 6 B (*like the foregoing, but with two vertical stripes in the lower half, with the following text\*): Contents . . . Activity . . . Transport Index . . . black symbol and words; upper half, yellow background: lower half,*

\* The text must be printed in an official language of the country of origin and, in addition, in French, German or Italian, unless international tariffs or agreements concluded between railway administrations provide otherwise.



*white background: vertical red stripes*: radioactive substance in packages of Category II-YELLOW; packages to be kept away from packages bearing a label with the word FOTO (see marg. 1605); in the event of damage to packages, danger to health by ingestion or inhalation of, or contact with spilt contents, and risk of external radiation at a distance;

prescribed in marg. 459 (1), 466 (2);

for prohibitions on mixed loading, see marg. 465, 467;

- No. 6 C (like the foregoing, but with three vertical stripes in the lower half): radioactive substance in packages of Category III-YELLOW; packages to be kept away from packages bearing a label with the word FOTO (see marg. 1605) and near which one should not remain unnecessarily; in the event of damage to packages, danger to health by ingestion or inhalation of, or contact with spilt contents, and risk of external radiation at a distance;

prescribed in marg. 459 (1), 466 (2);

for prohibitions on mixed loading, see marg. 465, 467;

- No. 6 D (stylised trefoil, inscription RADIOACTIVE; *black* symbol and word on *white background*): radioactive substance presenting the dangers described under 6 A, 6 B and 6 C;

prescribed in marg. 466 (1);

for prohibitions on mixed loading, see marg. 467;

- No. 7 (open *black* umbrella on *white background*): to be kept dry;

prescribed in marg. 188 (1), 195 (3);

for prohibitions on mixed loading, see marg. 194, 196;

- No. 8 (two *black* arrows on *white background*): this side up; label to be affixed, with arrows pointing upwards, on two opposite sides of the package;

prescribed in marg. 37 (2), 154 (2), 188 (3), 213 (2) and (3), 307 (3), 344 (2), 381 (2), 432 (2), 459 (3), 524 (2) and (3), 614, 711 (2);

- No. 9 (*red* wineglass on *white background*): handle with care, or: keep upright;

prescribed in marg. 37 (2), 43 (2), 112 (2), 117, 154 (1), (2), and (3), 164 (4), 188 (3), 195 (3), 213 (3), 220 (2), 307 (3), 313 (3), 344 (2), 351 (2), 381 (2), 388 (3), 432 (2), 440 (2), 459 (3), 524 (2), 532 (2), 614, 620, 711 (2), 717 (2).

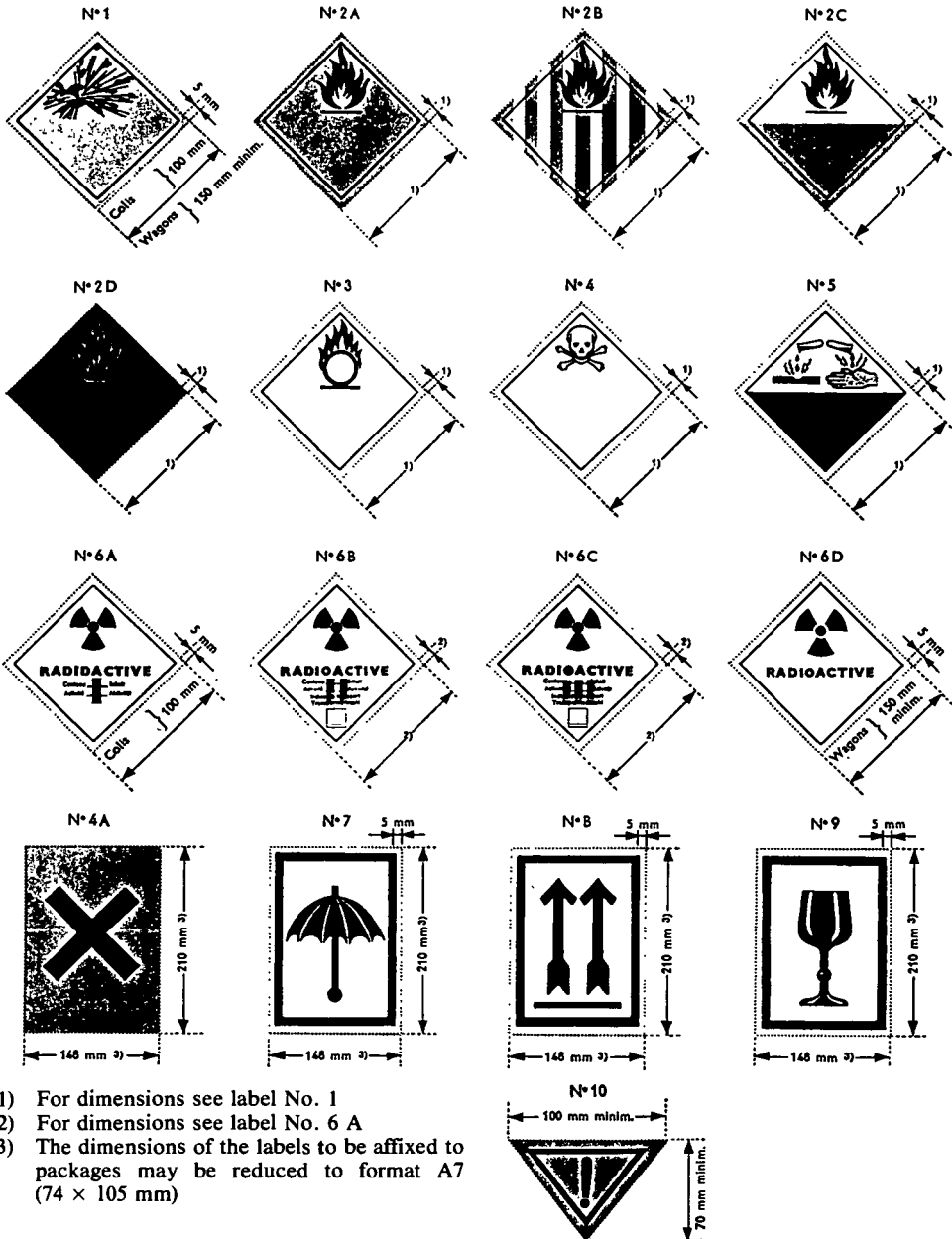
- No. 10 (triangular *red* label with an exclamation mark in *black*): shunt with care;

prescribed in marg. 164 (1), 220 (3), 313 (1).

*Danger labels*

For explanation of the diagrams: See Appendix IX (marg. 1902)

RID applicable as from 1.7.1973



- 1) For dimensions see label No. 1
- 2) For dimensions see label No. 6 A
- 3) The dimensions of the labels to be affixed to packages may be reduced to format A7 (74 × 105 mm)

## [TRANSLATION — TRADUCTION]

AMENDMENTS<sup>1</sup> TO THE TEXT OF ANNEX I (INTERNATIONAL REGULATIONS CONCERNING THE CARRIAGE OF DANGEROUS GOODS BY RAIL (RID) TO THE INTERNATIONAL CONVENTION CONCERNING THE CARRIAGE OF GOODS BY RAIL (CIM) OF 25 FEBRUARY 1961<sup>2</sup>

## PART I. GENERAL REGULATIONS

- 2 In paragraph (1), the following wording is added at the end:  
Appendix X, regulations relating to the use, construction and testing of tank containers.
- 7 Paragraphs (2), (3) and (4): new wording:
- (2) All provisions of RID relating to carriage in wagons apply similarly to carriage in large containers, apart from tank containers.
- (3) The regulations of Appendix X shall apply to the carriage of liquid, gaseous, powdery and granular substances in tank containers with a capacity of more than 0.45m<sup>3</sup>.
- (4) The regulations relating to receptacles sent as packages shall apply to small containers, with the exception of tank containers referred to in (3), intended for the carriage of goods in bulk, unless the special regulations of the various Classes state otherwise.

## PART II. REGULATIONS RELATING TO THE VARIOUS CLASSES

CLASS I d. GASES: COMPRESSED, LIQUEFIED  
OR DISSOLVED UNDER PRESSURE

- 131 Item 18: new wording:
18. *Empty receptacles*, uncleaned, including receptacles of tank wagons and tank containers, which have contained gases of items 1 and 2, boron trifluoride or fluorine of item 3, or gases of items 4 to 10 and 12 to 15.
- (Notes 1 and 2 are retained.)
- 132 Paragraphs (3) 2. and 6., Note: new wording:
- NOTE. For tank wagons, see marg. 159 (3); for tank containers, see Appendix X, under 2.7.I.
2. *Packing of individual substances*, Note: new wording:
- NOTE. Gases of items 12 and 13 may not be carried otherwise than in tank wagons (see marg. 161) or in tank containers (see Appendix X).

<sup>1</sup> The amendments were adopted by the XVIIIth session (second part) of the Commission of experts established under Annex VI to the Convention, in accordance with article 69 (4) of the said Convention, and took effect on 1 January 1974.

<sup>2</sup> See p. 5 of this volume.

- 133** Paragraph 2 (b), introductory part: new wording:  
 (b) Aluminium-alloy receptacles [see Appendix II, under A; for tank wagons, see marg. 159 (2) (a) 1.; for tank containers, see Appendix X, under 2.2.1] for:  
 b. *Conditions relating to metal receptacles*: new wording of note:  
 [These conditions are applicable neither to the aluminium-alloy bottles referred to in marg. 135 (3), nor to the metal tubes mentioned in marg. 136, nor to the receptacles mentioned in marg. 137 (1) (b), nor to the aerosol dispensers and non-refillable metal containers for gas under pressure referred to in marg. 138; for the receptacles of tank wagons, see also marg. 159 to 162; for tank containers, see Appendix X.]
- 141** Paragraph (2) (b), text in square brackets: new wording:  
 [for tank wagons, see marg. 159 (2) (a) 2.; for tank containers, see Appendix X].
- 142** Paragraph (1) (c), Note: new wording:  
 NOTE. For tank wagons and receptacles of any other kind fixed to their underframe, see also marg. 159 to 162; for tank containers, see Appendix X.  
 Paragraph (3) (c): new wording:  
 (c) For large receptacles in conformity with (1) (c), see marg. 159 (1), 160 (1), (2) and (3), 161 (1) and Appendix X.  
 3. *Marks on receptacles*, text in brackets: new wording:  
 (for the receptacles of tank wagons, see marg. 162; for tank containers, see Appendix X).
- 155** Paragraph (2): new wording:  
 (2) Gases of items 12 and 13 may not be carried otherwise than in tank wagons or tank containers. The sender and the railway must agree on the conditions of carriage before consignments are handed over for carriage; similar agreement is also necessary with respect to the carriage of gases of item 11 in tank wagons or in tank containers fitted with safety valves.
- 156** Paragraph (5), introductory part: new wording:  
 In the case of tank wagons and tank containers carrying gases of item 11, the sender shall include in the consignment note one of the following entries, as appropriate:  
 Paragraph (6), introductory part: new wording:  
 In the case of tank wagons and tank containers carrying gases of items 12 and 13, the sender shall include in the consignment note the following entry:
- 163** Paragraph (3) is deleted.  
 Subheading preceding marg. 164: new wording:  
 2. *Marking and danger labels on wagons, on tank containers and on small containers* (see Appendix IX)

**164** Paragraph (1): new wording:

(1) Tank wagons and tank containers with a capacity of more than 1 m<sup>3</sup> carrying gases of items 1 to 13 shall bear on both sides labels conforming to model No. 10.

## Paragraph (5): new wording:

(5) Tank wagons and tank containers carrying substances of item 1 (a)—with the exception of carbon monoxide—item 1 (b)—with the exception of water gas—substances of item 6, dimethylamine, dimethyl ether, ethylamine, chloroethane, ethylene oxide, methylamine, chloromethane, vinyl bromide, vinyl chloride or methyl vinyl ether of item 8 (a), 1,1-difluoroethane or chlorodifluoroethane of item 8 (b), ethane or ethylene of item 9, 1,1-difluoroethylene or vinyl fluoride of item 10 or substances of item 12 shall bear on both sides labels conforming to model No. 2 A. Tank wagons and tank containers carrying oxygen or boron trifluoride of item 3, nitrous oxide of item 9 or liquid oxygen of item 11 shall bear on both sides labels conforming to model No. 3. Tank wagons and tank containers carrying anhydrous ammonia, chlorine, sulphur dioxide or T gas of item 5 or bromomethane of item 8 (a) shall bear on both sides labels conforming to model No. 4. Tank wagons and tank containers carrying liquid air of item 11 shall bear on both sides labels conforming to model No. 5. Tank wagons and tank containers carrying carbon monoxide of item 1 (a), water gas of item 1 (b), compressed oil gas of item 2, liquefied oil gas of item 4, hydrogen sulphide of item 5 or trimethylamine or methanethiol of item 8 (a) shall bear on both sides labels conforming to models Nos. 2 A and 4. Tank wagons and tank containers carrying nitrogen dioxide of item 5 or phosgene of item 8 (a) shall bear on both sides labels conforming to models Nos. 3 and 4. Tank wagons and tank containers carrying hydrogen bromide or hydrogen fluoride of item 5 or anhydrous hydrogen chloride of item 10 shall bear on both sides labels conforming to models Nos. 4 and 5.

**168** Paragraph (1): new wording:

(1) In so far as marg. 131 to 167 and Appendix X do not prescribe any conditions to be fulfilled by receptacles intended for the carriage of gases which are compressed, liquefied or dissolved under pressure, the regulations of the country of departure shall apply to receptacles, whether the receptacles are separate from or form part of tank wagons.

## Paragraph (2) (e): new wording:

(e) Transitional measures for tank containers, see Appendix X.

CLASS I e. SUBSTANCES WHICH GIVE OFF INFLAMMABLE GASES  
ON CONTACT WITH WATER

**181** Item 5: new wording:

(5) *Empty receptacles*, uncleaned, including the receptacles of tank wagons, tank containers and small containers, which have contained substances of Class I e.

- 183 Paragraph (4): new wording:  
 (4) For the carriage in tank wagons, of sodium, potassium and alloys of sodium and potassium [item 1 (a)], see marg. 193; for their carriage in tank containers, see Appendix X.
- 186 In paragraph (1), "500" is replaced by "450".  
 A new paragraph (3) reading as follows is added:  
 (3) For carriage in tank containers, see Appendix X.
- 194 Paragraph (3): new wording:  
 (3) Substances whose carriage in bulk is permitted may be enclosed without packaging in small containers, which must comply with the requirements of marg. 192.
- 199 This marginal now reads:  
 Receptacles referred to in marg. 186, of a capacity exceeding 450 litres, which were in service before the entry into force of Appendix X are to be accepted for international carriage for a period of three years from the entry into force of that Appendix.

#### CLASS II. SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION

- 201 Item 14: new wording:  
 14. Empty iron drums, uncleaned, and empty receptacles of tank wagons and empty tank containers, uncleaned, which have contained phosphorus of item 1.
- 203 Paragraph (3): new wording:  
 (3) For carriage in tank wagons, see marg. 218; for carriage in tank containers, see Appendix X.
- 209 This marginal now reads:  
 (1) Substances of items 7 to 10 and 12 shall be enclosed in tightly closing packages. Wooden packagings used for substances of items 7 and 8 shall be fitted with a leakproof lining.  
 (2) For the carriage in tank containers of freshly quenched charcoal in powder or in grains (item 8), see Appendix X.  
 Subheading preceding marg. 220: new wording:  
 2. *Marking and danger labels on wagons, on tank containers and on small containers (see Appendix IX)*
- 220 Paragraph (1): new wording:  
 (1) Wagons in which substances of items 1 to 4 and 6 are loaded shall bear on both sides labels conforming to model No. 2 C.  
 Tank wagons and tank containers carrying substances of item 1 shall also bear on both sides labels conforming to model No. 2 C.
- 223 Paragraph (1), text in square brackets: new wording:  
 [for receptacles of tank wagons and tank containers, see under (2)].

Paragraph (2), introductory part: new wording:

(2) Receptacles of tank wagons and tank containers which have contained phosphorus of item 1 shall at the time they are handed over for carriage:

CLASS III a. INFLAMMABLE LIQUIDS

301 Item 6: new wording:

6. *Empty receptacles*, uncleaned, including receptacles of tank wagons and tank containers, which have contained inflammable liquids of Class III a.

302 Paragraph (1): new wording:

(1) Receptacles shall be so closed and leakproof as to prevent any loss of the contents, and particularly any evaporation. For the special regulations relating to the receptacles of tank wagons, see marg. 311 (3); for those relating to tank containers, see Appendix X.

303 Paragraph (10): new wording:

(10) For carriage in tank wagons, see marg. 311; for carriage in tank containers, see Appendix X.

305 Paragraph (2): new wording:

(2) For carriage in tank wagons, see marg. 311; for carriage in tank containers, see Appendix X.

312 Paragraph (3) is deleted.

Subheading preceding marg. 313: new wording:

2. *Marking and danger labels on wagons, on tank containers and on small containers* (see Appendix IX)

313 This marginal now reads:

(1) Wagons, tank wagons and tank containers in which substances of items 1 to 3 and 5 are loaded shall bear on both sides labels conforming to model No. 2 A. In addition, such wagons and tank wagons, and the wagons carrying such tank containers, shall bear on both sides labels conforming to model No. 10. Wagons, tank wagons and tank containers in which acrylaldehyde or chloroprene (chlorobutadiene) [item 1 (a)] are loaded shall, in addition, bear on both sides labels conforming to model No. 4.

(2) Wagons, tank wagons and tank containers in which methanol (item 5) is loaded shall bear on both sides labels conforming to model No. 4.

(3) Small containers shall be labelled in conformity with marg. 307 (1) and (2).

Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

316 Paragraph (3): new wording:

(3) Receptacles of item 6 having contained methanol (item 5), handed over for carriage in less than full wagon loads, and tank wagons

and tank containers shall bear a label conforming to model No. 4 (see Appendix IX).

#### CLASS III b. INFLAMMABLE SOLIDS

**333** Paragraphs (2) and (3): new wording:

(2) Substances of item 1 and sulphur of item 2 (a) may also be carried in bulk in conformity with marg. 348 (1) and marg. 350 (3). For the carriage in tank containers of sulphur of item 2 (a), see Appendix X.

(3) Sulphur of item 2 (b) may not be carried otherwise than in tank wagons (see marg. 349) or in tank containers (see Appendix X).

**339** A new paragraph (3) reading as follows is added:

(3) For the carriage in tank containers of phosphorus pentasulphide and phosphorus sesquisulphide (item 8), see Appendix X.

**342** Paragraphs (3) and (4): new wording:

(3) Naphthalene of item 11 (a) and (b) may also be carried in bulk in conformity with marg. 348 (2) and marg. 350 (3). For carriage in tank containers, see Appendix X.

(4) Naphthalene of item 11 (c) may not be carried otherwise than in tank wagons (see marg. 349) or in tank containers (see Appendix X).

Subheading preceding marg. 351: new wording:

2. *Marking and danger labels on wagons, on tank containers and on small containers* (see Appendix IX)

**351** Paragraph (1): new wording:

(1) Wagons in which substances of items 4 to 8 are loaded and tank containers carrying phosphorus sesquisulphide or phosphorus pentasulphide (item 8) shall bear on both sides labels conforming to model No. 2 B.

#### CLASS III c. OXIDISING SUBSTANCES

**371** Item 11: new wording:

11. *Empty packagings*, uncleaned, including receptacles of tank wagons, tank containers and small containers, which have contained substances of Class III c.

(The Note is retained.)

**373** Paragraph (4): new wording:

(4) For carriage in tank wagons, see marg. 386; for carriage in tank containers, see Appendix X.

**374** Paragraph (2): new wording:

(2) For carriage in tank wagons, see marg. 386; for carriage in tank containers, see Appendix X.



- 375 Paragraph (2): new wording:  
(2) For carriage in tank wagons, see marg. 386; for carriage in tank containers, see Appendix X.
- 376 Paragraph (9): new wording:  
(9) For the carriage of solids in bulk, see marg. 385 and 387 (3); for the carriage of solutions in tank wagons or jar wagons, see marg. 386; for the carriage of solutions and of moist sodium chlorate in tank containers, see Appendix X.
- 387 In paragraph (3), the last sentence (“Solutions of substances of item 4 may also be carried in small tank containers”) is deleted.  
Subheading preceding marg. 388: new wording:  
2. *Marking and danger labels on wagons, on tank containers and on small containers* (see Appendix IX)
- 388 Paragraphs (1) and (2): new wording:  
(1) Wagons and tank containers in which substances of Class III c are loaded shall bear on both sides labels conforming to model No. 3.  
(2) Small containers shall be labelled in conformity with marg. 381 (1).

#### CLASS IV a. POISONOUS SUBSTANCES

- 401 Items 91 and 92: new wording:
91. *Empty packagings, uncleaned, including receptacles of tank wagons and tank containers, and empty bags, uncleaned, which have contained substances of items 1 to 5, 11 to 14, 21 to 23, 31 to 33, 41, 51 to 54, 81 and 82.*
92. *Empty packagings, uncleaned, including receptacles of tank wagons, tank containers and small containers, and empty bags, uncleaned, which have contained substances of items 61, 62, 71 to 75, 83 and 84.*  
(The Note is retained.)
- 404 Paragraph (3): new wording:  
(3) For the carriage in tank wagons, of acrylonitrile and acetonitrile [item 2 (a) and (b)], see marg. 438; for their carriage in tank containers, see Appendix X.
- 405 A new paragraph (3) reading as follows is added:  
(3) For the carriage in tank containers, of aqueous solutions of ethyleneimine (item 3), see Appendix X.
- 406 Paragraph (2): new wording:  
(2) For the carriage in tank wagons of allyl chloride [item 4 (a)], see marg. 438; for the carriage in tank containers of allyl chloride [item 4 (a)], methyl chloroformate [item 4 (b)] and ethyl chloroformate [item 4 (c)], see Appendix X.

- 408 Paragraph (3): new wording:  
(3) For the carriage in tank wagons of 2-cyanopropan-2-ol [item 11 (a)] and aniline [item 11 (b)], see marg. 438; for their carriage in tank containers, see Appendix X.
- 409 Paragraph (6): new wording:  
(6) For the carriage in tank wagons of 1-chloro-2,3-epoxypropane and 2-chloroethanol [item 12 (a) and (b)], see marg. 438; for the carriage in tank containers of 1-chloro-2,3-epoxypropane [item 12 (a)] and 2,2-dichlorodiethyl ether [item 12 (f)], see Appendix X.
- 410 Paragraph (3): new wording:  
(3) For the carriage in tank wagons of allyl alcohol, dimethyl sulphate and phenol [item 13 (a), (b) and (c)], see marg. 438; for their carriage in tank containers, see Appendix X.
- 411 Paragraph (2): new wording:  
(2) For carriage in tank wagons, see marg. 438; for carriage in tank containers, see Appendix X.
- 412 A new paragraph (9) reading as follows is added:  
(9) For carriage in tank containers, see Appendix X.
- 413 Paragraph (2): new wording:  
(2) For the carriage in tank wagons of cresols and xylenols of item 22 (a) and (b), see marg. 438; for their carriage in tank containers, see Appendix X.
- 414 A new paragraph (3) reading as follows is added:  
(3) For carriage in tank containers, see Appendix X.
- 415 Paragraph (3): new wording:  
(3) For the carriage in tank wagons of substances of item 31 (b), see marg. 438; for their carriage in tank containers, see Appendix X.
- 423 A new paragraph (4) reading as follows is added:  
(4) For the carriage in tank containers of 1,2-dibromoethane [item 61 (a)] and of carbon tetrachloride, chloroform and methylene chloride (which are assimilated thereto), of methyl chloroacetate [item 61 (e)], of ethyl chloroacetate [item 61 (f)], of benzyl chloride [item 61 (k)] and of benzotrichloride (which is assimilated to substances of item 62), see Appendix X.
- 427 Paragraph (2): new wording:  
(2) For the carriage in tank wagons of liquids of item 81, see marg. 438; for their carriage in tank containers, see Appendix X.
- 428 Paragraph (2): new wording:  
(2) For the carriage in tank wagons of liquids of item 82, see marg. 438; for their carriage in tank containers, see Appendix X.
- 429 Paragraph (2): new wording:

(2) For the carriage in tank wagons of liquids of item 83, see marg. 438; for their carriage in tank containers, see Appendix X.

438 In paragraph (1), the last sentence (“Removable receptacles\* shall be fixed to the underframe of the wagons so that they cannot shift”) and the footnote are deleted.

Paragraph (3): new wording:

(3) Receptacles for substances of item 14 must be made of welded fine-grain steel, with thoroughly reliable welds. They must in addition satisfy the following requirements:

(a) They shall be made of sheet steel of a thickness such that the product of this thickness (in millimetres) and the minimum tensile strength (in kg/mm<sup>2</sup>) of the steel used must be at least equal to 520;

(b) However, receptacles whose capacity does not exceed 10,000 litres may be made of sheet steel not less than 10 mm thick and those whose capacity does not exceed 12,500 litres may be made of sheet steel not less than 12.5 mm thick;

(c) The construction of the receptacles must be such that they can withstand a hydraulic test at an effective pressure of 7 kg/cm<sup>2</sup>; this test must be repeated at the end of a period equal to twice the period prescribed for the periodic inspection of the wagon carrying the receptacle. The receptacles shall have all their openings above the level of the liquid; no piping or branch-pipe shall pass through the walls of the receptacles below the level of the liquid. Receptacles shall be surrounded by a protective covering whose thickness shall be at least 75 mm; this protective covering shall be kept in place by a sheathing made of sheet steel at least 3 mm thick or of sheet aluminium alloy of equivalent strength. The openings shall be hermetically closed and the closure shall be protected by means of a securely fixed metal cap;

(d) Receptacles shall not be filled beyond 95 per cent of their capacity.

439 Paragraph (4) is deleted.

Subheading preceding marg. 440: new wording:

2. *Marking and danger labels on wagons, on tank containers and on small containers (see Appendix IX)*

440 In paragraph (1), a new second subparagraph reading as follows is added:

Tank containers carrying substances of items 2 to 4, 11 to 14, 21 to 23, 31, 81 and 82 shall bear on both sides labels conforming to model No. 4; tank containers carrying substances of items 2 to 4 and 11 (a) shall in addition bear on both sides labels conforming to model No. 2 A. Tank containers carrying substances of items 61, 62 and 83 shall bear on both sides labels conforming to model No. 4 A.

443 Paragraphs (2) and (3): new wording:

(2) Other packagings of items 91 and 92, including receptacles of tank wagons and tank containers, must be closed in the same manner and leakproof in the same degree as though they were full.

(3) Packages of item 91 handed over for carriage in less than full wagon loads, tank wagons, tank containers, and packed bags of item 91 shall bear labels conforming to model No. 4; packed bags of item 92 shall bear labels conforming to model No. 4 A (see Appendix IX).

CLASS V. CORROSIVE SUBSTANCES

- 501** Item 51: new wording:  
51. *Empty packagings*, uncleaned, including receptacles of tank wagons and tank containers, which have contained substances of Class V, except for those of items 13 and 36.
- 503** Paragraph (6): new wording:  
(6) For the carriage in tank wagons of substances of items 1 (a) to (d) and 2 to 5, see marg. 529; for their carriage in tank containers, see Appendix X.
- 505** Paragraph (2): new wording:  
(2) For the carriage in tank wagons of substances of items 6 and 7, see marg. 529; for the carriage in tank containers of substances of items 6 to 8, see Appendix X.
- 506** Paragraph (3): new wording:  
(3) For carriage in tank wagons, see marg. 529; for carriage in tank containers, see Appendix X.
- 507** Paragraph (2): new wording:  
(2) For the carriage in tank wagons of the named substances of item 11 (a), see marg. 529; for the carriage in tank containers of substances of item 11, see Appendix X.
- 508** Paragraph (2): new wording:  
(2) For the carriage in tank wagons of antimony trichloride, see marg. 529; for the carriage in tank containers of substances of item 12, see Appendix X.
- 509** Paragraph (2): new wording:  
(2) For the carriage in bulk of bisulphates (item 13), see marg. 528 and 530 (4); for the carriage in tank wagons of antimony pentafluoride of item 15 (b), see marg. 529; for the carriage in tank containers of substances of items 13 and 15, see Appendix X.
- 510** Paragraph (2) (b): new wording:  
(b) Their capacity must not exceed 450 litres;  
Paragraph (5): new wording:  
(5) For the carriage of bromine in tank wagons, see marg. 529; for its carriage in tank containers, see Appendix X.
- 511** Paragraph (3): new wording:  
(3) For the carriage in tank wagons of substances of item 21 (b), (c) and (e), see marg. 529; for the carriage in tank containers of substances of item 21, see Appendix X.

- 512 Paragraph (2): new wording:  
(2) For the carriage in tank wagons of acetyl chloride and benzoyl chloride, see marg. 529; for the carriage in tank containers of substances of item 22, see Appendix X.
- 513 Paragraph (3): new wording:  
(3) For carriage in tank wagons, see marg. 529; for carriage in tank containers, see Appendix X.
- 514 A new paragraph (4) reading as follows is added:  
(4) For the carriage in tank containers of substances of item 31, see Appendix X.
- 515 Paragraph (2): new wording:  
(2) For carriage in tank wagons, see marg. 529; for carriage in tank containers, see Appendix X.
- 517 Paragraph (3): new wording:  
(3) For carriage in tank wagons, see marg. 529; for carriage in tank containers, see Appendix X.
- 518 Paragraph (2): new wording:  
(2) For carriage in tank wagons, see marg. 529; for carriage in tank containers, see Appendix X.
- 519 A new paragraph (3) reading as follows is added:  
(3) For carriage in tank containers, see Appendix X.
- 520 Paragraph (3): new wording:  
(3) For carriage in tank wagons, see marg. 529; for carriage in tank containers, see Appendix X.
- 521 Paragraph (4): new wording:  
(4) For carriage in tank wagons and jar wagons, see marg. 529; for carriage in tank containers, see Appendix X.
- 530 Paragraph (3) is deleted.  
Subheading preceding marg. 531: new wording:  
2. *Marking and danger labels on wagons, on tank containers and on small containers* (see Appendix IX)
- 531 This marginal now reads:  
Tank wagons intended for the carriage of bromine (item 14) shall have affixed to the wagon a plate bearing the following particulars: the word "Bromine", the tare of the wagon, including the fittings and accessories, and the maximum permissible load in kilograms; in addition to what is prescribed in Appendix X, tank containers intended for the carriage of bromine shall bear on both sides a plate with the word "Bromine".
- 532 Paragraphs (1) and (2): new wording:  
(1) Wagons in which substances of items 1 to 7, 9, 11, 12, 14, 15, 22, 31 to 35 and 41 (a) are loaded and tank containers carrying substances of Class V shall bear on both sides labels conforming to model No. 5.

(2) Small containers shall be labelled in conformity with marg. 524 (1).

Small containers enclosing packages that bear a label conforming to model No. 9 shall also bear this label.

535 Paragraph (1): new wording:

(1) Receptacles of item 51 must, when carried in less than full wagon loads, be closed in the same manner and leakproof in the same degree as though they were full.

Empty receptacles of tank wagons and empty shells of tank containers which have contained bromine (item 14) must be hermetically closed.

536 This marginal now reads:

Receptacles referred to in marg. 510, of a capacity exceeding 450 litres, which were in service before the entry into force of Appendix X, are to be accepted for international carriage for a period of three years from the entry into force of that Appendix.

#### CLASS VII. ORGANIC PEROXIDES

701 Item 50: new wording:

50. *Empty packagings*, uncleaned, including receptacles of tank wagons and tank containers, which have contained substances of Class VII.

704 Paragraph (8): new wording:

(8) For the carriage in tank wagons of substances of items 10, 14 and 15, see marg. 715; for their carriage in tank containers, see Appendix X.

Subheading preceding marg. 717: new wording:

2. *Marking and danger labels on wagons, on tank containers and on small containers* (see Appendix IX)

717 Paragraph (1): new wording:

(1) Wagons in which packages containing organic peroxides are loaded and tank containers carrying substances of items 10, 14 and 15 shall bear on both sides labels conforming to model No. 3.

Appendix II, heading of part B: new wording:

B. REGULATIONS AND RECOMMENDATIONS CONCERNING THE MATERIALS AND CONSTRUCTION OF TANK WAGONS AND SHELLS OF TANK CONTAINERS INTENDED FOR THE CARRIAGE OF DEEPLY REFRIGERATED LIQUEFIED GASES OF CLASS I D

1250 Paragraph (1): new wording:

(1) Receptacles shall be made of steel, aluminium, aluminium alloy, copper or brass. However, receptacles made of copper or brass shall be allowed only for gases containing no acetylene; ethylene may however contain not more than 0.005% acetylene.

**1901** Paragraph (1): new wording:

(1) Danger labels must be stuck on packages, wagons, tank containers and small containers or affixed in some other suitable manner. Only where the external state of a package will not allow this should they be stuck on cards or tablets securely attached to the package. On packing cases, private wagons, tank containers and small containers, indelible danger markings corresponding exactly to the prescribed models may be used instead of labels.

**1902** Under Nos. 2 A, 3, 4 and 5, replace the references to the marginals by the following:

No. 2 A . . . :

prescribed in marg. 154 (3), 164 (2), (3) and (5), 188 (2), 195 (2) and (3), 307 (1), 313 (1) and (3), 432 (1), 440 (1);

No. 3 . . . :

prescribed in marg. 164 (5), 381 (1), 388 (1) and (2), 711 (1), 717 (1) and (2);

No. 4 . . . :

prescribed in marg. 164 (5), 307 (1) and (2), 313 (1), (2) and (3), 316 (3), 432 (1), 440 (1) and (2), 443 (3);

No. 5 . . . :

prescribed in marg. 164 (5), 381 (1), 388 (2), 524 (1), 532 (1) and (2), 535 (3);

**Appendix X.** A new Appendix X reading as follows is added:**APPENDIX X****REGULATIONS RELATING TO THE USE, CONSTRUCTION  
AND TESTING OF TANK CONTAINERS****1.** *Regulations applicable to all Classes***1.1** *General, scope, definitions*

**1.1.1** These regulations shall apply to tank containers of a capacity of more than 0.45 m<sup>3</sup> which are used for the carriage of liquid, gaseous, powdery or granular substances, and to their accessories.

**1.1.2** Part 1 sets out the regulations applicable to tank containers intended for the carriage of substances of all Classes. Parts 2 to 6 and 8 contain special regulations supplementing or modifying the regulations of Part 1.

**1.1.3** A tank container comprises a shell and items of equipment, including the equipment to facilitate movement of the tank container without change of attitude.

**1.1.4** In the following regulations:

- 1.1.4.1** —“Shell” means the tank proper (including the openings and their closures);  
—“Service equipment of the shell” means filling, discharge, venting, safety, heating and heat-insulating devices and measuring instruments;

- “Structural equipment” means the reinforcing, fastening, protective or stabilising members external to the shell;
- 1.1.4.2. —“Calculation pressure” means a notional pressure at least equal to the test pressure which, depending on the degree of danger presented by the substance being carried, may to a greater or lesser degree exceed the working pressure. It is used solely to determine the thickness of the walls of the shell, to the exclusion of any external or internal reinforcing device;
- “Maximum working pressure” means the highest of the following three pressures:
- (a) The highest effective pressure allowed in the shell during filling (maximum filling pressure allowed);
  - (b) The highest effective pressure allowed in the shell during discharge (maximum discharge pressure allowed);
  - (c) The effective pressure to which the shell is subjected by its contents (including such extraneous gases as it may contain) when the temperature reaches 50° C (total pressure);
- “Test pressure” means the highest effective pressure applied during the pressure test of the shell;
- “Filling pressure” means the highest pressure actually built up in the shell when it is being filled under pressure;
- “Discharge pressure” means the highest pressure actually built up in the shell when it is being discharged under pressure;
- 1.1.4.3 —“Leakage test” means the test which consists of subjecting the shell to an effective internal pressure equal to the maximum working pressure, but not less than 0.2 kg/cm<sup>2</sup> (manometric pressure), by a procedure approved by the competent authority.
- 1.2 *Construction*
- 1.2.1 Shells shall be made of ductile metallic materials. For welded shells only a material whose weldability has been fully demonstrated shall be used. Welds shall be made in accordance with technical regulations and shall afford complete safety. The materials of shells or of their protective linings which are in contact with the contents shall not contain substances liable to react dangerously with them, to form dangerous compounds or substantially to weaken the material.
- 1.2.2 Shells, their attachments and their service and structural items of equipment shall be designed to withstand static and dynamic stresses in normal carriage without loss of contents.\*
- 1.2.3 The pressure on which the dimensioning of the tank container shell is based shall not be less than the calculation pressure, but the stresses referred to in paragraph 1.2.2 shall also be taken into account.
- 1.2.4 Unless specially prescribed otherwise in the various Classes, the following minimum requirements shall be taken into account in the design of the shells:
- 1.2.4.1 —The shell of gravity-discharge tank containers intended for the carriage of substances having at 50° C a total pressure (i.e. vapour pressure plus partial pressure of inert gases, if any) of not more than 1.1 kg/cm<sup>2</sup> (absolute pressure) shall be designed for a test pressure of twice the static pressure of the liquid to be carried, but not less than twice the static pressure of water;

\* This shall not apply to quantities of gas escaping through any degassing vents.



- 1.2.4.2 —The shell of pressure-filling or pressure-discharge tank containers intended for the carriage of substances having at 50° C a total pressure (i.e. vapour pressure plus partial pressure of inert gases, if any) of not more than 1.1 kg/cm<sup>2</sup> (absolute pressure) shall be designed for a test pressure equal to 1.3 times the filling or discharge pressure;
- 1.2.4.3 —The shell of tank containers—whatever their filling or discharge systems—intended for the carriage of substances having at 50° C a total pressure (i.e. vapour pressure plus partial pressure of inert gases, if any) of not less than 1.1 and not more than 1.75 kg/cm<sup>2</sup> (absolute pressure) shall be designed for a test pressure of at least 1.5 kg/cm<sup>2</sup> (manometric pressure) or of 1.3 times the filling or discharge pressure, whichever is higher;
- 1.2.4.4 —The shell of tank containers—whatever their filling or discharge systems—intended for the carriage of substances having at 50° C a total pressure (i.e. vapour pressure plus partial pressure of inert gases, if any) of more than 1.75 kg/cm<sup>2</sup> (absolute pressure) shall be designed for a test pressure equal to the higher of the following two pressures:  
 —1.5 times the total pressure at 50° C, less 1 kg/cm<sup>2</sup>, subject to a minimum of 4 kg/cm<sup>2</sup> (manometric pressure) or  
 —1.3 times the filling or discharge pressure.
- 1.2.5 Tank containers intended to contain certain dangerous substances shall be provided with additional protection. This may take the form of additional thickness of the shell (such additional thickness being determined in the light of the dangers inherent in the substances concerned—see the relevant Classes) or of a protective device.
- 1.2.6 At the calculation pressure or the test pressure, whichever is the higher, the stress  $\sigma$  (sigma) at the most severely stressed point of the shell shall conform to the material-dependent limits prescribed below. In addition, in choosing the material and determining wall thickness, the maximum and minimum filling and working temperatures should be taken into account, with particular reference to the risk of brittle fracture.
- 1.2.6.1 For metals and alloys exhibiting a clearly defined yield point or characterised by a guaranteed conventional yield stress  $R_e$  (generally 0.2% of residual elongation):
- 1.2.6.1.1 —Where the ratio  $R_e/R_m$  is not more than 0.66  
 ( $R_e$  = apparent yield stress or 0.2% proof stress;  
 $R_m$  = guaranteed minimum tensile strength):  
 $\sigma \leq 0.75 R_e$
- 1.2.6.1.2 —Where the ratio  $R_e/R_m$  exceeds 0.66:  
 $\sigma \leq 0.5 R_m$
- 1.2.6.2 For metals and alloys exhibiting no apparent yield stress and characterised by a guaranteed minimum tensile strength  $R_m$ ;  
 $\sigma \leq 0.43 R_m$
- 1.2.6.3\* The elongation at fracture, in per cent, shall not be less than  $\frac{1,000}{R_m}$ , but it shall be not less than 20% in the case of steel and not less than 12% in the case of aluminium alloys.

\* The test-piece used to determine the elongation at fracture shall be taken at right angles to the direction of rolling and be so secured that:  $L_0 = 5d$ ,  
 where  $L_0$  = length of the test-piece before the test  
 $d$  = diameter.

- 1.2.7 Tank containers intended for the carriage of inflammable liquids having a flash-point of not more than 55° C and for the carriage of inflammable gases shall be capable of being electrically earthed.
- 1.2.8 Tank containers shall be capable of absorbing the forces specified in paragraph 1.2.8.1 and the wall thickness of the shells shall be as prescribed in paragraphs 1.2.8.2 to 1.2.8.4 below.
- 1.2.8.1 Tank containers and their fastenings shall, under the maximum permissible load, be capable of absorbing the following forces:
- In the direction of travel, twice the total weight;
  - Horizontally at right angles to the direction of travel, the total weight; (where the direction of travel is not clearly determined, the maximum permissible load shall be equal to twice the total weight);
  - Vertically, upwards, the total weight and
  - Vertically, downwards, twice the total weight.
- Under each of these loads, the safety factors to be observed shall be the following:
- For metals having a clearly defined yield point, a safety factor of 1.5 in relation to the guaranteed yield stress or,
  - For metals with no clearly defined yield point, a safety factor of 1.5 in relation to the guaranteed 0.2% proof stress.
- 1.2.8.2 The minimum thickness of the cylindrical wall of the shell shall be calculated by the following formula:

$$e = \frac{P \times D}{200 \times \sigma} \text{ mm}$$

where:

- P = calculation pressure or test pressure, whichever is higher, in kg/cm<sup>2</sup>
- D = internal diameter of shell, in mm
- σ = permissible stress as defined in paragraphs 1.2.6.1.1, 1.2.6.1.2 and 1.2.6.2, in kg/mm<sup>2</sup>.

The thickness shall, in no case, be less than as prescribed in paragraphs 1.2.8.3 and 1.2.8.4.

- 1.2.8.3 The walls and ends of shells not more than 1.80 m in diameter shall be at least 5 mm thick if of mild steel\* (in conformity with the provisions of 1.2.6) or of equivalent thickness if of another metal. Where the diameter exceeds 1.80 m, this thickness shall be increased to 6 mm if the tank is of mild steel\* (in conformity with the provisions of 1.2.6) or to an equivalent thickness if the tank is of another metal.
- 1.2.8.4 Where additional protection of the shell against damage is provided, the competent authority may allow the aforesaid minimum thickness to be reduced in proportion to the protection provided; however, for shells not more than 1.80 m in diameter the said thickness shall be not less than 3 mm in the case of mild steel\*, or than an equivalent thickness in the case of other materials. For shells with a diameter exceeding 1.80 m, the aforesaid minimum thickness shall be increased to 4 mm in the case of mild steel<sup>3</sup> and to an equivalent thickness in the case of another metal.

\* "Mild steel" means a steel having an ultimate tensile strength between 37 and 44 kg/mm<sup>2</sup>.

1.2.9 Tank containers shall be carried only on wagons whose fastenings are capable, under the maximum permissible load of the tank containers, of absorbing the forces specified in 1.2.8.1 above.

1.3 *Items of equipment*

1.3.1 The items of equipment shall be so arranged as to be protected against the risk of being wrenched off or damaged during carriage and handling. If the connection between the frame and the shell allows relative movement as between these sub-assemblies, the items of equipment shall be so fastened as to permit such movement without risk of damage to fittings.

The items of equipment shall exhibit a suitable degree of safety comparable to that of the shell.

In addition, special conditions applicable to bottom-discharge tank containers are prescribed in 1.3.2 below.

1.3.2 Every bottom-discharge tank container, and in the case of compartmented bottom-discharge tank containers every compartment, shall be equipped with two mutually independent shut-off devices mounted in series, the first being an internal stop-valve\* fixed directly to the shell and the second being a sluice-valve or an equivalent device,\*\* placed at each end of the discharge pipe. The internal stop-valve shall be operable from above or from below. If possible, the setting—open or closed—of the internal stop-valve shall be capable of being verified from the ground in both cases. Internal stop-valve control devices shall be so designed as to prevent any unintended opening through impact or inadvertent action.

The internal shut-off device must continue to be effective in the event of damage to the external control device.

In order to avoid any loss of contents in the event of damage to the external discharge fittings (pipes, lateral shut-off devices), the internal stop-valve and its seating shall be protected against the danger of being wrenched off by external stresses or shall be so designed as to resist them. The filling and discharge fittings (including flanges or threaded plugs) and any protective covers shall be capable of being secured against any unintended opening.

1.3.3 The tank container or each of its compartments shall, save where it is intended for the carriage of deeply refrigerated gases, be provided with an opening large enough to permit inspection.

1.3.4 Tank containers intended for the carriage of liquids having a vapour pressure of not more than 1.1 kg/cm<sup>2</sup> (absolute pressure) at 50° C shall have a venting system and a safety device to prevent the contents from spilling out of the shell if the tank container overturns; otherwise they must conform to the requirements of 1.3.5 or 1.3.6 below.

1.3.5 Tank containers intended for the carriage of liquids having a vapour pressure of between 1.1 and 1.75 kg/cm<sup>2</sup> (absolute pressure) at 50° C shall have a safety valve set at not less than 1.5 kg/cm<sup>2</sup> (manometric pressure) and such that it is fully open at pressure not exceeding the test pressure; otherwise they must conform to the requirements of 1.3.6.

1.3.6 Tank containers intended for the carriage of liquids having a vapour pressure of between 1.75 and 3 kg/cm<sup>2</sup> (absolute pressure) at 50° C shall have a safety valve set at not less than 3 kg/cm<sup>2</sup> (manometric pressure) and such that it is fully open at a pressure not exceeding the test pressure; otherwise they must be hermetically closed.

\* Except in the case of shells intended for the carriage of certain crystallisable or highly viscous substances.

\*\* In the case of tank containers of less than 1 m<sup>3</sup> capacity, the sluice-valve or other equivalent device may be replaced by a blank flange.

1.3.7 Movable parts, such as covers, closure devices, etc., which are liable to come into frictional or percussive contact with aluminium tank containers intended for the carriage of inflammable liquids having a flash-point less than or equal to 55° C or for the carriage of inflammable gases shall not be made of unprotected corrodible steel.

#### 1.4 *Type approval*

The competent authority or a body designated by that authority shall issue in respect of each new type of tank container a certificate attesting that the prototype tank container, including fastenings, which it has surveyed is suitable for the purpose for which it is intended and meets the construction requirements of section 1.2 and the equipment requirements of section 1.3. If the tank containers are manufactured in series without modification, this approval shall be valid for the entire series. The test results, the substances for the carriage of which the tank container is approved and an approval number shall be recorded in a test report. The approval number shall consist of the distinguishing symbol\* of the State in whose territory the approval was granted and a registration number.

#### 1.5 *Tests*

1.5.1 Shells and their equipment shall, either together or separately, undergo an initial inspection before being put into service and shall, thereafter, undergo periodic inspections. The initial inspection shall include a check of the design characteristics, an external and internal examination and a hydraulic-pressure test. If the shells and their equipment are tested separately, they shall be jointly subjected to a leakage test after assembly. The periodic inspections shall include an external and internal examination and, as a general rule, a hydraulic-pressure test. Sheathing for thermal insulation and the like shall be removed only to the extent required for a reliable appraisal of the tank container's characteristics. The initial and periodic pressure tests shall be carried out by an expert approved by the competent authority, at the test pressure indicated on the data plate of the tank container, except in cases where lower test pressures are authorised for the periodic tests. In special cases, and with the agreement of the competent authority, the hydraulic-pressure test may be replaced by a pressure test using another liquid or a gas.

1.5.2 Tank containers shall, before being put into service and thereafter at intervals not exceeding five years, be tested in conformity with the provisions of 1.5.1 above. Before tank containers are put into service, and thereafter at intervals not exceeding two and one half years, all the equipment shall be checked for leakproofness and satisfactory operation.

1.5.3 Certificates showing the results of these tests shall be issued by the expert approved by the competent authority.

\* The relevant symbols are as follows:

A	Austria	F	France	MA	Morocco
B	Belgium	FL	Liechtenstein	N	Norway
BG	Bulgaria	GB	United Kingdom of Great Britain and Northern Ireland	NL	Netherlands
CH	Switzerland			P	Portugal
CS	Czechoslovakia			PL	Poland
D	Germany, Federal Republic of	GR	Greece	R	Romania
DDR	German Democratic Republic	H	Hungary	S	Sweden
		I	Italy	SF	Finland
DK	Denmark	IR	Iran	SYR	Syria
DZ	Algeria	IRL	Ireland	TN	Tunisia
E	Spain	IRQ	Iraq	TR	Turkey
		L	Luxembourg	YU	Yugoslavia

## 1.6 *Marking*

1.6.1 Each tank container shall bear a corrosion-resistant metal plate permanently attached to the shell in a place readily accessible for inspection. The following particulars, at least, shall be marked on the plate by stamping or by any other similar method. These particulars may be engraved directly on the walls of the shell itself, if the walls are so reinforced that the strength of the shell is not impaired:

- Approval number
- Manufacturer's name or mark
- Manufacturer's serial number
- Year of manufacture
- Test pressure in kg/cm<sup>2</sup> (manometric pressure)
- Capacity in litres—in the case of multiple-element tank containers
- The capacity of each element
- Design temperature (only if above + 50° C or below - 20° C)
- Date (month, year) of initial test and of most recent periodic test
- Stamp of the expert who carried out the tests.

In addition, the maximum working pressure allowed shall be inscribed on pressure-filling or pressure-discharge tank containers.

1.6.2 The following particulars shall be inscribed either on the tank container itself or on a board:

- Names of the owner and the operator
- Capacity of the shell
- Unladen (tare) weight
- Maximum permissible laden weight
- Name of the substance being carried.\*

In addition, tank containers shall bear the prescribed danger labels.

## 1.7 *Operation*

1.7.1 During carriage, tank containers shall be secured to the carrying vehicle in such a way as to be adequately protected by the fixtures of the carrying vehicle or of the tank container itself against lateral and longitudinal impact and against overturning\*\*. If the shells and the service equipment are so constructed as to withstand impact or overturning, they need not be protected in this way.

1.7.2 Tank containers shall not be loaded with any dangerous substances other than those for whose carriage they have been approved.

1.7.3 The following degrees of filling shall not be exceeded in tank containers intended for the carriage of liquids at ambient temperatures:

\* A generic designation or a reference number may be given instead of the name.

\*\* Examples of protection of shells:

1. Protection against lateral impact may, for example, consist of longitudinal bars protecting the shell on both sides at the level of the median line.
2. Protection against overturning may, for example, consist of reinforcing rings or bars fixed transversely in relation to the frame.
3. Protection against rear impact may, for example, consist of a bumper or frame.

- 1.7.3.1 —Where inflammable substances not presenting additional risks (e.g. toxic or corrosive properties) are loaded in tank containers with a venting system, with or without safety valves:

$$\text{degree of filling} = \frac{100}{1 + \alpha (50 - t_F)} \text{ or } \frac{100}{1 + 35 \alpha} \% \text{ of capacity;}$$

- 1.7.3.2 —Where toxic or corrosive substances, whether or not presenting a fire risk, are loaded in tank containers with a venting system, with or without safety valves:

$$\text{degree of filling} = \frac{98}{1 + \alpha (50 - t_F)} \text{ or } \frac{98}{1 + 35 \alpha} \% \text{ of capacity;}$$

- 1.7.3.3 —Where inflammable substances and low-concentration acids and lyes in closed tank containers:

$$\text{degree of filling} = \frac{97}{1 + \alpha (50 - t_F)} \text{ or } \frac{97}{1 + 35 \alpha} \% \text{ of capacity;}$$

- 1.7.3.4 —Where toxic substances and high-concentration acids and lyes are loaded in closed tank containers:

$$\text{degree of filling} = \frac{95}{1 + \alpha (50 - t_F)} \text{ or } \frac{95}{1 + 35 \alpha} \% \text{ of capacity;}$$

- 1.7.3.5 In these formulae,  $\alpha$  represents the mean coefficient of cubical expansion of the liquid between 15° C and 50° C, i.e. for a maximum variation in temperature of 35° C.

$$\alpha \text{ is calculated by the formula: } \alpha = \frac{d_{15} - d_{50}}{35 \times d_{50}},$$

where  $d_{15}$  and  $d_{50}$  are the densities of the liquid at 15° C and 50° C respectively and  $t_F$  is the mean temperature of the liquid during filling.

- 1.7.3.6 The provisions of 1.7.3.1 to 1.7.3.4 above shall not apply to tank containers whose contents are maintained by means of a heating device at a temperature above 50° C during carriage. In such a case the degree of filling at the outset shall be such and the temperature so regulated that the tank container is not full beyond 95% of its capacity at any time during carriage.

- 1.7.4 The shells of tank containers intended for the carriage of liquids,\* which are not divided by partitions or surge plates into sections of not more than 5,000 litres capacity, shall be filled to not less than 80% of their capacity, unless they are practically empty.

- 1.7.5 Tank containers shall be closed in such a way that the contents cannot spill out uncontrolled.

- 1.7.6 Where several closure systems are fitted in series, that nearest to the substance being carried shall be closed first.

- 1.7.7 No residue of the dangerous substance being carried shall adhere to the outside of a tank container during carriage.

\* Substances whose efflux time at 20° C from a DIN cup with a 4 mm orifice does not exceed 10 minutes (corresponding to an efflux time of less than 690 sec. at 20° C from a No. 4 Ford cup or less than 2680 centistokes) shall be deemed to be liquids for the purposes of this provision.

- 1.7.8 To be accepted for carriage, empty tank containers shall be closed in the same manner and leakproof in the same degree as though they were full.
- 1.8 *Transitional measures*
- 1.8.1 Tank containers of a capacity below 1,000 litres manufactured before the entry into force of these regulations and not in compliance with them may, if they were manufactured in conformity with the provisions of RID, be used for a period of three years as from the date of entry into force of these regulations for the carriage of liquids or of gaseous, powdery or granular substances.
- 1.8.2 Tank containers of a capacity of 1,000 litres and above may, with the approval of the competent authority of the countries in which they are to be carried, be used for a period of five years as from the date of entry into force of these regulations for the carriage of liquids or of gaseous, powdery or granular substances.
- 2 *Special regulations applicable to Class I d: Gases: compressed, liquefied or dissolved under pressure*
- 2.1 *Use*
- All substances of marg. 131, items 1 to 14, except fluorine (item 3) and cyanogen chloride [item 8 (a)], may be carried in tank containers. However, hydrogen fluoride (anhydrous hydrofluoric acid) (item 5), chlorine (item 5) and phosgene (carbonyl chloride) [item 8 (a)] shall not be carried otherwise than in tank containers whose volume exceeds 1 m<sup>3</sup>.
- 2.2 *Construction*
- 2.2.1 The shells of tank containers intended for the carriage of substances of items 1 to 10 and 14 shall not be made of aluminium or aluminium alloy.
- 2.2.2 The requirements of marg. 1250 to 1286 shall apply to the materials and construction of the shells of tank containers intended for the carriage of gases of items 11 to 13.
- 2.2.3 The shells of tank containers intended for the carriage of hydrogen fluoride (anhydrous hydrofluoric acid) (item 5) shall be designed for a pressure of 21 kg/cm<sup>2</sup> (manometric pressure).
- 2.3 *Items of equipment*
- 2.3.1 In addition to being equipped with the devices prescribed in 1.3.2, the discharge pipes of tank container shells shall be capable of being closed by blank flanges or some other equally reliable device.
- 2.3.2 The shells of tank containers intended for the carriage of liquefied gases may, in addition to being provided with filling, discharge and gas-pressure-equalizing orifices, be provided with openings for the fitting of gauges, thermometers and manometers.
- 2.3.3 Safety valves shall meet the conditions prescribed in 2.3.3.1 to 2.3.3.3 below:
- 2.3.3.1 The shells of tank containers intended for the carriage of gases of items 1 to 10 and 14 may be fitted with not more than two safety valves. The safety valves shall be capable of opening automatically at a pressure of between 0.9 and 1.0 times the test pressure of the shell to which they are fitted. They shall in addition be constructed in such a way that, should the shell be totally engulfed by fire, the pressure inside the shell will not exceed the test pressure. They shall be of a type able to withstand dynamic stresses, including liquid surge. The use of dead-weight or counter-weight valves is prohibited.

The shells of tank containers intended for the carriage of gases of items 1 to 14 harmful to the respiratory organs or entailing a poison risk<sup>1</sup> shall not have safety valves unless the safety valves are preceded by a frangible disc. In the latter case, the arrangement of the frangible disc and the safety valve shall be satisfactory to the competent authority.

2.3.3.2 The shells of tank containers intended for the carriage of gases of item 11 which are not in constant communication with the outside air and those intended for the carriage of gases of items 12 and 13 shall be fitted with two independent safety valves, each so designed as to permit evacuation of the gases from the shell in such a way that the pressure does not at any time exceed the working pressure indicated on the tank container by more than 10 per cent. In addition, the shells of such tank containers may be fitted with frangible discs in series, preceding the safety valves. In such a case, the arrangement of the frangible disc and the safety valve shall be satisfactory to the competent authority.

2.3.3.3 The safety valves of the shells of tank containers intended for the carriage of gases of items 11 to 13 shall be capable of opening at the working pressure indicated on the tank container. They shall be so designed as to function faultlessly even at their lowest working temperature. The reliability of their operation at the lowest temperature shall be established and checked either by testing each valve or by testing a specimen valve of the same type of construction.

2.3.4 An internal flow-restricting valve or equivalent device shall be fitted to every orifice more than 1.5 mm in diameter provided in the shell for the passage of gases or liquids, other than orifices carrying safety valves.

2.3.5 Thermal insulation:

2.3.5.1 If the shells of tank containers intended for the carriage of liquefied gases of items 4 to 8 are equipped with thermal insulation, such insulation shall, subject to the special provisions under 2.3.5.2, consist of either:

- A sun shield covering not less than the upper third but not more than the upper half of the tank-container and separated from the shell by an air space about 4 cm across; or
- A complete cladding, of suitable thickness, of insulating materials.

The thermal insulation shall be so designed as not to impede access to the filling and discharge devices.

2.3.5.2 The shells of tank containers intended for the carriage of butadiene (item 6), methyl vinyl ether, ethylene oxide and vinyl bromide [item 8 (a)] and chlorotrifluoroethylene (monochlorotrifluoroethylene) [item 8 (b)] shall be protected by a sun shield as described above.

2.3.5.3 The shells of tank containers intended for the carriage of gases of items 11 to 13 shall be thermally insulated. The thermal insulation shall be protected against impact by means of continuous metal sheathing. If the space between the shell and the metal sheathing is under vacuum (vacuum insulation), the protective sheathing shall be so designed as to withstand without deformation an external pressure of at least 1 kg/cm<sup>2</sup> (manometric pressure). If the sheathing is so closed as to be gas-tight, a device shall be provided to prevent any dangerous pressure from developing in the insulating layer in the event of inadequate gas-tightness of the shell or its equipment. The device shall prevent the infiltration of moisture into the heat-insulating sheath.

<sup>1</sup> See footnotes on p. 381 of this volume.



- 2.3.5.4 The shells of tank containers intended for the carriage of liquid air, liquid oxygen or liquid mixtures of oxygen with nitrogen (item 11) shall have no combustible material either in the thermal insulation or in the fastening to the frame.
- 2.3.6 In the case of multiple-element tank containers, the following conditions shall be met:
- 2.3.6.1 If one of the elements of a multiple-element tank container is fitted with a safety valve and shut-off devices are provided between the elements, every element shall be so fitted.
- 2.3.6.2 The fitting and discharge devices may be fitted to a manifold.
- 2.3.6.3 Each element of a multiple-element tank container intended for the carriage of compressed gases of items 1 to 3 harmful to the respiratory organs or entailing a poison risk\* shall be capable of being isolated by a valve.
- 2.3.6.4 The elements of a multiple-element tank container intended for the carriage of liquefied gases of items 4 to 10 harmful to the respiratory organs or entailing a poison risk\*\* shall be so designed that they can be filled separately and can be kept isolated by a sealed valve.
- 2.4 *Type approval*  
No special requirements.
- 2.5 *Tests*
- 2.5.1 The materials of the shells of tank containers intended for the carriage of gases of items 11 to 13 shall be tested by the method described in marg. 1275 to 1286.
- 2.5.2 The test pressures shall be as follows:
- 2.5.2.1 Tank containers intended for the carriage of gases of items 1 to 3: in conformity with marg. 149 (1);
- 2.5.2.2 Tank containers intended for the carriage of gases of items 4 to 8 in conformity with marg. 150 (2) if the shells are not more than 1.5 m in diameter, and in conformity with marg. 160 (2) (b) if the shells are more than 1.5 m in diameter;
- 2.5.2.3 Tank containers intended for the carriage of gases of items 9 and 10 in conformity with marg. 150 (3) and (4), and in conformity with marg. 160 (3) (b) in the case of multiple-element tank containers if the elements are interconnected and form a battery, are not isolated from one another, and are encased in a thermal insulation;
- 2.5.2.4 Tank containers intended for the carriage of ammonia dissolved under pressure (item 14): in conformity with marg. 160 (6);
- 2.5.2.5 Tank containers fitted with safety valves and intended for the carriage of gases of items 11 to 13: 1.5 times the working pressure indicated on the shells, but not less than 3 kg/cm<sup>2</sup> (manometric pressure); for tank containers with vacuum insulation the test pressure shall be 1.5 times the working pressure, plus 1 kg/cm<sup>2</sup>.

\* The following are deemed to be compressed gases harmful to the respiratory organs or entailing a poison risk: carbon monoxide, water gas, synthesis gases, town gas, compressed oil gas, boron trifluoride, and also mixtures of carbon monoxide, water gas, synthesis gas or town gas.

\*\* The following are deemed to be liquefied gases harmful to the respiratory organs or entailing a poison risk: hydrogen bromide (anhydrous hydrobromic acid), hydrogen fluoride (anhydrous hydrofluoric acid), hydrogen sulphide (sulphuretted hydrogen), ammonia, chlorine, sulphur dioxide, nitrogen dioxide (nitrogen peroxide), T gas, methyl vinyl ether, chloromethane (methyl chloride), bromomethane (methyl bromide), phosgene, vinyl bromide, methylamine, dimethylamine, trimethylamine, ethylamine, ethylene oxide, methanethiol (methyl mercaptan), mixtures of carbon dioxide with ethylene oxide, and anhydrous hydrogen chloride.

In the case of tank containers without safety valves and intended for the carriage of gases of item 11, the first test shall be performed at 2 kg/cm<sup>2</sup> (manometric pressure) and the periodic tests at 1 kg/cm<sup>2</sup> (manometric pressure).

2.5.3 The first hydraulic-pressure test shall be carried out before the thermal insulation is put in position.

2.5.4 The capacity of the shell of each tank container intended for the carriage of gases of items 4 to 8 and 14 shall be determined, under the supervision of an expert approved by the competent authority, by weighing or by volumetric measurement of the quantity of water required to fill the shell. The measurement of shell capacity shall be accurate to within 1%. Determination by a calculation based on the dimensions of the shell is not permitted. The maximum filling weights allowed according to marg. 150 (4) and 160 (5) shall be prescribed by an approved expert.

2.5.5 All welds in the shell shall be checked in non-destructive tests by radiographic or ultrasonic means.

2.5.6 Notwithstanding the requirements of 1.5, the periodic tests shall take place:

2.5.6.1 —Every two and one half years in the case of tank containers intended for the carriage of town gas [item 1 (b)], boron trifluoride (item 3), hydrogen bromide (anhydrous hydrobromic acid), hydrogen fluoride (anhydrous hydrofluoric acid), hydrogen sulphide (sulphuretted hydrogen), chlorine, sulphur dioxide and nitrogen dioxide (nitrogen peroxide) (item 5), phosgene (carbonyl chloride) [item 8 (a)] and anhydrous hydrogen chloride (item 10);

2.5.6.2 —After six years' service in the case of tank containers, without safety valves, intended for the carriage of gases of item 11;

2.5.6.3 —After eight years' service and thereafter every 12 years in the case of tank containers fitted with safety valves and intended for the carriage of gases of item 11 and in the case of tank containers intended for the carriage of gases of items 12 and 13. A tightness (leakproofness) check may be performed, at the request of the competent authority, between any two successive tests.

2.5.7 In the periodic tests of tank containers equipped with vacuum insulation and intended for the carriage of gases of items 11 to 13, the hydraulic-pressure test may be replaced by a tightness (leakproofness) test performed either with the gases which the tank containers are intended to contain or with an inert gas.

2.5.8 If, in the course of the periodic inspections, apertures are made in the shells of tank containers intended for the carriage of gases of items 11 to 13, the method by which they are hermetically closed before the tank containers are returned to service shall be one agreed to by the approved expert and shall ensure the integrity of the shell.

## 2.6 *Marking*

2.6.1 In addition, the following particulars shall be marked by stamping or any other similar method on the plate prescribed in 1.6.1, or directly on the walls of the shell itself if the walls are so reinforced that the strength of the shell is not impaired.

2.6.1.1 On tank containers intended for the carriage of only one substance:

—The name of the gas in full.

This information shall be accompanied, in the case of tank containers intended for the carriage of compressed gases of items 1 to 3, by an indication of the tank container's maximum permitted filling pressure and, in the case of

tank containers intended for the carriage of liquefied gases of items 4 to 13 and of ammonia dissolved under pressure of item 14, by an indication of the maximum permissible load in kg.

2.6.1.2 On multi-purpose tank-containers:

—The names, in full, of the gases for whose carriage the tank container is approved.

This information shall be accompanied by an indication of the maximum permissible load in kg for each gas.

2.6.1.3 On tank containers fitted with safety valves and containing gases of item 11 and on tank containers intended for the carriage of gases of items 12 and 13:

—The working pressure.

2.6.1.4 On tank containers equipped with thermal insulation, the words "thermally insulated" shall be inscribed in an official language of the country of departure and, in addition, in French, German, Italian, or English, unless international tariffs or agreements concluded between the railway administrations provide otherwise.

2.6.2 The frame of a multiple-element tank container shall be fitted near the filling point with a plate specifying:

—The test pressure of the elements;

—The working pressure of elements intended for compressed gases;

—The number of elements;

—The aggregate capacity of the elements, in litres;

—The name of the gas in full

and, in addition, in the case of liquefied gases,

—The maximum permissible load per element, in kg.

2.7 *Operation*

2.7.1 In tank containers used for the successive carriage of different liquefied gases of items 4 to 13 (multi-purpose tank containers), only substances listed in the same one of the following groups may be carried:

Group 1: hydrocarbons of items 6 and 7;

Group 2: chlorinated and fluorinated derivatives of hydrocarbons of item 8 (b) and 8 (c);

Group 3: ammonia (item 5), methylamine, dimethylamine, trimethylamine and ethylamine [item 8 (a)]

Group 4: chloromethane (methyl chloride), bromomethane (methyl bromide), chloroethane (ethyl chloride) and vinyl chloride [item 8 (a)];

Group 5: T gas (item 5) and ethylene oxide [item 8 (a)];

Group 6: liquid air, liquid oxygen, liquid nitrogen, also when mixed with rare gases, liquid mixtures of oxygen with nitrogen, also when they contain rare gases, and liquid rare gases (item 11);

Group 7: liquid methane, liquid ethane, liquid mixtures of methane with ethane, also when they contain propane or butane, liquid ethylene (item 12).

2.7.2 Tank containers which have been filled with one of the substances of a group shall be completely emptied of liquefied gas and blown down before being loaded with another substance belonging to the same group.

- 2.7.3 The multiple use of tank containers for the carriage of liquefied gases of the same group shall be allowed if all the requirements prescribed for the gases to be carried in one and the same tank container are observed. Such multiple use shall be subject to approval by an approved expert.
- 2.7.4 The multiple use of tank containers for the carriage of gases of different groups shall be allowed if permitted by the approved expert.
- 2.7.5 When loaded tank containers or empty but uncleaned tank containers are handed over for carriage, only the particulars applicable to the gas loaded or just discharged shall be visible; all particulars concerning other gases shall be covered up.
- 2.7.6 The elements of a multiple-element tank container shall contain only one and the same gas. In the case of a multiple-element tank container intended for the carriage of liquefied gases harmful to the respiratory organs or entailing a poison risk,\* the elements shall be filled separately and kept isolated by a sealed valve.
- 2.7.7 The permissible degrees of filling in kg/litre prescribed in marg. 150 (2), (3) and (4) and 160 (3) and (6) shall be observed.
- 2.7.8 The degree of filling of the shells of tank containers fitted with safety valves and intended for the carriage of gases of items 11 to 13 shall be such that at the "alert" temperature, at which the vapour pressure is equal to the valve-opening pressure, the volume of the liquid does not exceed the permissible degree of filling of the shell at that temperature, i.e. 95% in the case of inflammable gases and 98% in the case of other gases.
- 2.7.9 On the shells of tank containers intended for the carriage of liquid air and liquid oxygen or liquid mixtures of oxygen and nitrogen (item 11), substances containing grease or oil shall not be used to ensure leakproofness of the joints or for the maintenance of the closures.
3. *Special regulations applicable to Class III a: Inflammable liquids*
- 3.1 *Use*
- All substances of marg. 301 except nitromethane (item 3) may be carried in tank containers.
- 3.2 *Construction*
- The shells of tank containers intended for the carriage of carbon disulphide [item 1 (a)] shall be designed for a pressure of 10 kg/cm<sup>2</sup> (manometric pressure).
- 3.3 *Items of equipment*
- 3.3.1 Tank containers which are fitted with a venting device not capable of being closed and which are intended for the carriage of inflammable liquids with a flash-point not higher than 55° C and tank containers fitted with a safety valve shall have a flame-trap in the venting device.
- 3.3.2 All openings in the shells of tank containers intended for the carriage of acrylaldehyde (acrolein), chloroprene (chlorobutadiene) and carbon disulphide [item 1 (a)] shall be above the surface level of the liquid. No piping or pipe connections shall pass through the walls of the shell below the surface level of

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\* The following are deemed to be liquefied gases harmful to the respiratory organs or entailing a poison risk: hydrogen bromide (anhydrous hydrobromic acid), hydrogen fluoride (anhydrous hydrofluoric acid), hydrogen sulphide (sulphuretted hydrogen), ammonia, chlorine, sulphur dioxide, nitrogen dioxide (nitrogen peroxide), T gas, methyl vinyl ether, chloromethane (methyl chloride), bromomethane (methyl bromide), phosgene, vinyl bromide, methylamine, dimethylamine, trimethylamine, ethylamine, ethylene oxide, methanethiol (methyl mercaptan), mixtures of carbon dioxide with ethylene oxide, and anhydrous hydrogen chloride.

the liquid. The openings shall be capable of being hermetically closed and the closure shall be capable of being protected by a lockable cover.

3.4 *Type approval*

No special requirements.

3.5 *Tests*

No special requirements.

3.6 *Marking*

No special requirements.

3.7 *Operation*

3.7.1 In the case of liquids having a vapour pressure of more than 1.75 kg/cm<sup>2</sup> (absolute pressure) at 50° C, the following degrees of filling of hermetically-closed shells shall not be exceeded:

For methyl formate [item 1 (a)] and other liquids having a coefficient of cubical expansion of more than  $150 \times 10^{-5}$  but not more than  $180 \times 10^{-5}$ : 91% of capacity;

For acetaldehyde (item 5) and other liquids having a coefficient of cubical expansion of more than  $180 \times 10^{-5}$  but not more than  $230 \times 10^{-5}$ : 90% of capacity.

3.7.2 An aluminium shell shall not be used for the carriage of acetaldehyde (item 5) unless the shell is reserved solely for such carriage and the acetaldehyde is free from acid.

3.7.3 In the cold season (October to March), light distillates for cracking and other liquid hydrocarbons having a vapour pressure not exceeding 1.5 kg/cm<sup>2</sup> (absolute pressure) at 50° C may be carried in shells of the type prescribed in 1.3.4.

3.7.4 Carbon disulphide [item 1 (a)] shall not be carried otherwise than in hermetically closed shells or in shells equipped with valves set at not less than 3 kg/cm<sup>2</sup> (manometric pressure).

4. *Special regulations applicable to Classes I e, II, III b: Substances which give off inflammable gases on contact with water; substances liable to spontaneous combustion; inflammable solids*

4.1 *Use*

Sodium, potassium and alloys of sodium and potassium [item 1 (a)] and trichlorosilane (silicochloroform) (item 4) of marg. 181, white or yellow phosphorus (item 1) and freshly quenched charcoal in powder or in grains (item 8) of marg. 201, sulphur (item 2), phosphorus sesquisulphide and phosphorus pentasulphide (item 8) and naphthalene (item 11) of marg. 331 may be carried in tank containers.

4.2 *Construction*

The shells of tank containers intended for the carriage of trichlorosilane (silicochloroform) of marg. 181, item 4, and white or yellow phosphorus of marg. 201, item 1, shall be designed for a pressure of 10 kg/cm<sup>2</sup> (manometric pressure).

4.3 *Items of equipment*

4.3.1 The shells of tank containers intended for the carriage of substances of marg. 181, item 1 (a), shall have their openings and orifices (valves, terminals, apertures, etc.) protected by lockable leakproof covers and shall be equipped with thermal insulation made of materials which are not readily inflammable so

that the temperature on the outer surface cannot rise above 50° C during carriage.

4.3.2 The shells of tank containers intended for the carriage of white or yellow phosphorus of marg. 431, item 1, shall meet the following requirements:

4.3.2.1 The heating device shall not penetrate into, but shall be exterior to, the body of the shell. Other piping shall enter the shell in its upper part; openings shall be above the highest permissible level of the phosphorus and be capable of being completely enclosed under lockable covers.

4.3.2.2 The shell shall be equipped with a gauging system for verifying the level of the phosphorus and, if water is used as the protective agent, with a fixed gauge mark showing the highest permissible level of the water.

4.3.3 The shells of tank containers intended for the carriage of sulphur of item 2 (b) or naphthalene of item 11 (c) of marg. 331 shall be equipped with thermal insulation made of materials which are not readily inflammable so that the temperature on the outer surface cannot rise above 50° C during carriage. They may be equipped with valves opening automatically inwards or outwards under the effect of a difference of pressure of 0.2 to 0.3 kg/cm<sup>2</sup>. The discharge devices shall be capable of being protected by a lockable metal cover.

4.4 *Type approval*

No special requirements.

4.5 *Tests*

The shells of tank containers intended for the carriage of trichlorosilane (silicochloroform) of marg. 181, item 4, or white or yellow phosphorus of marg. 201, item 1, and those intended for the carriage of sulphur of marg. 331, item 2 (the filling temperature must additionally be taken into account in the case of shells made of aluminium) or naphthalene of marg. 331, item 11, shall be tested at a pressure of 4 kg/cm<sup>2</sup> (manometric pressure).

4.6 *Marking*

No special requirements.

4.7 *Operation*

4.7.1 For the carriage of substances of marg. 181, item 1 (a), covers shall be locked in conformity with 4.3.1 and the temperature of the outside surface of the shell shall not exceed 50° C.

4.7.2 In the case of trichlorosilane (silicochloroform) of marg. 181, item 4, the degree of filling shall not exceed 1.14 kg per litre of capacity if filling is by weight, or 85% if filling is by volume.

4.7.3 White or yellow phosphorus of marg. 201, item 1, shall, if water is used as the protective agent, be covered with a depth of not less than 12 cm of water at the time of filling; the degree of filling at a temperature of 60° C shall not exceed 98%. If nitrogen is used as the protective agent, the degree of filling at a temperature of 60° C shall not exceed 96%. The remaining space shall be filled with nitrogen in such a way that, even after cooling, the pressure at no time falls below atmospheric pressure. The shell shall be hermetically closed so that no leakage of gas occurs.

4.7.4 The shells of tank containers intended for the carriage of sulphur of marg. 331, item 2, shall not be filled beyond 98% of their capacity.

4.7.5 The shells of tank containers which have contained phosphorus of marg. 201, item 1, shall, when handed over for carriage:

—Either be filled with nitrogen; the sender shall certify in the consignment note that the tank, after closure, is gas-tight;

—Or be filled with water to not less than 96% and not more than 98% of their capacity; between 1 October and 31 March this water shall contain one or more anti-freeze agents free from corrosive action, not liable to react with phosphorus, and in such concentrations as to make it impossible for the water to freeze during carriage.

5. *Special regulations applicable to Classes III c and VII: Oxidising substances; organic peroxides*

5.1 *Use*

Substances of items 1 to 3 and solutions of item 4 (and moist sodium chlorate) of marg. 371, and substances of marg. 701, items 10, 14 and 15, may be carried in tank containers.

5.2 *Construction*

The shells of tank containers, and their equipment, intended for the carriage of aqueous solutions of hydrogen peroxide and hydrogen peroxide of marg. 371, item 1, and liquid organic peroxides of marg. 701, items 10, 14 and 15, shall be made of aluminium not less than 99.5% pure or of a suitable special steel not liable to cause the hydrogen peroxide or the organic peroxides to decompose.

5.3 *Items of equipment*

5.3.1

The shells of tank containers intended for the carriage of aqueous solutions of hydrogen peroxide containing more than 70% hydrogen peroxide and hydrogen peroxide of marg. 371, item 1, shall have their openings above the surface level of the liquid. In the case of solutions containing more than 60% but not more than 70% hydrogen peroxide, openings below the surface level of the liquid shall be permissible. In this case, the shell-discharge fittings shall include two mutually independent shut-off devices, the first being a quick-closing internal stop-valve of an approved type and the second a sluice-valve placed at each end of the discharge pipe. A blank flange or another device providing the same measure of security shall also be fitted to the outlet of each external sluice-valve. The internal stop-valve shall be such that it remains rigidly locked to the shell and in the closed position if the pipe is wrenched off.

5.3.2

The connections to the external pipe-outlets of tank containers shall be covered by a suitable plastics material.

5.3.3

The shells of tank containers intended for the carriage of liquid organic peroxides of marg. 701, items 10, 14 and 15, shall be equipped with a venting device fitted with a flame-trap and followed in series by a safety valve opening automatically at a manometric pressure of 1.8 to 2.2 kg/cm<sup>2</sup>. The materials of which closures liable to come into contact with the liquid or its vapour are made shall not have a catalytic effect (spring-loaded safety valve made of aluminium-silicon alloy (silumin) or of V2A stainless steel or of a material of equivalent quality).

5.3.4

The shells of tank containers intended for the carriage of liquid organic peroxides of marg. 701, items 10, 14 and 15, shall be equipped with thermal insulation in accordance with 2.3.5.1. The covering and the uncovered part of the shell shall be painted white.

5.4 *Type approval*

No special requirements.

### 5.5 Tests

The shells of tank containers intended for the carriage of aqueous solutions of hydrogen peroxide and hydrogen peroxide of marg. 371, item 1, and of liquid organic peroxides of marg. 701, items 10, 14 and 15, shall be tested at a pressure of 4 kg/cm<sup>2</sup> (manometric pressure).

### 5.6 Marking

No special requirements.

### 5.7 Operation

5.7.1 The inside of the shell of the tank container and all metal parts liable to come into contact with hydrogen peroxide of marg. 371, item 1, shall be kept clean. No lubricant capable of combining dangerously with the substance carried shall be used for pumps, valves or other devices.

5.7.2 The shells of tank containers intended for the carriage of liquids of marg. 371, items 1 to 3, shall not be filled beyond 95% of their capacity at a reference temperature of 15° C. The shells of tank containers intended for the carriage of liquid organic peroxides of marg. 701, items 10, 14 and 15, shall not be filled beyond 80% of their capacity. Shells shall be free from impurities at the time of filling.

## 6. *Special regulations applicable to Classes IV a and VI: Poisonous substances and infectious substances*

### 6.1 Use

The following substances of marg. 401 may be carried in tank containers:

Acrylonitrile [item 2 (a)],

Acetonitrile (methyl cyanide) [item 2 (b)],

Aqueous solutions of ethyleneimine (item 3),

Allyl chloride [item 4 (a)],

Methyl chloroformate [item 4 (b)],

Ethyl chloroformate [item 4 (c)],

2-cyanopropan-2-ol (acetone cyanohydrin) [item 11 (a)],

Aniline [item 11 (b)],

1-chloro-2,3-epoxypropane (epichlorohydrin) [item 12 (a)],

2,2-dichlorodiethyl ether (chloroethyl ether, 2-chloroethyl ether) [item 12 (f)],

Allyl alcohol [item 13 (a)],

Dimethyl sulphate [item 13 (b)],

Phenol [item 13 (c)],

Lead alkyls [item 14],

2-bromophenylacetoneitrile (bromobenzyl cyanide) [item 21 (a)],

Phenylcarbylamine chloride [item 21 (b)],

2,4-diisocyanatotoluene [item 21 (c)], and its mixtures with 2,6-diisocyanatotoluene (which are assimilated to it),

Allyl isothiocyanate [item 21 (d)],

Chloroanilines [item 21 (e)],

Mononitroanilines and dinitroanilines [item 21 (f)],



Naphthylamines [item 21 (g)],  
2,4-diaminotoluene [item 21 (h)],  
Dinitrobenzenes [item 21 (i)],  
Chloronitrobenzenes [item 21 (k)],  
Mononitrotoluenes [item 21 (l)],  
Dinitrotoluenes [item 21 (m)],  
Nitroxylenes [item 21 (n)],  
Toluidines [item 21 (o)],  
Xylidines [item 21 (p)],  
Cresols [item 22 (a)],  
Xylenols [item 22 (b)],  
Xylyl bromide [item 23 (a)],  
Phenacyl chloride ( $\omega$ -chloroacetophenone) [item 23 (b)],  
Phenacyl bromide ( $\omega$ -bromoacetophenone) [item 23 (c)],  
4-chloroacetophenone [item 23 (d)],  
1,3-dichloroacetone [item 23 (e)],  
Solutions of inorganic cyanides [item 31 (b)],  
1,2-dibromoethane [item 61 (a)], and carbon tetrachloride, chloroform and  
methylene chloride (which are assimilated to it),  
Methyl chloroacetate [item 61 (e)],  
Ethyl chloroacetate [item 61 (f)],  
Benzyl chloride [item 61 (k)],  
Benzotrichloride (which is assimilated to substances of item 62),  
Substances and preparations used as pesticides (items 81 to 83).

## 6.2 *Construction*

6.2.1 The shells of tank containers intended for the carriage of substances of marg. 401, items 2 (a), 3, 4 (a), 11 (a), 13 (b), 14, 23, 61 (a)—with the exception of carbon tetrachloride, chloroform and methylene chloride, 61 (e), 61 (f), 81 and 82 (if these substances are liquid at + 40° C), shall be designed for a pressure of 10 kg/cm<sup>2</sup> (manometric pressure).

6.2.2 The shells of tank containers intended for the carriage of substances referred to in 6.1, other than those enumerated in 6.2.1 above, shall be so constructed that they can be discharged at a pressure of not less than 3 kg/cm<sup>2</sup> (manometric pressure).

## 6.3 *Items of equipment*

All openings in the shells of tank containers intended for the carriage of substances referred to in 6.1 shall be above the surface level of the liquid. No piping or pipe connections shall pass through the walls of the shell below the surface level of the liquid. The openings shall be capable of being hermetically closed, and the closure shall be capable of being protected by a lockable cover. In addition, the shells of such tank containers may be fitted with frangible discs mounted in series, preceding the safety valves. In such a case, the arrangement of the frangible disc and the safety valve shall be satisfactory to the competent authority.

- 6.4 *Type approval*  
No special requirements.
- 6.5 *Tests*  
Tank containers intended for the carriage of substances of marg. 401, items 2 (a), 3, 4 (a), 11 (a), 13 (b), 14, 23, 61 (a), 61 (e), 61 (f), 81 and 82 (if these substances are liquid at + 40° C), shall be tested initially and periodically at a pressure of 4 kg/cm<sup>2</sup> (manometric pressure).
- 6.6 *Marking*  
No special requirements.
- 6.7 *Operation*
- 6.7.1 The shells of tank containers intended for the carriage of substances of marg. 401, items 2 (a) and (b), 4 (a), 11 (a), 12 (a) 13 (a) and (b) and 81 to 83, shall not be filled beyond 93% of their capacity.
- 6.7.2 The shells of tank containers intended for the carriage of aqueous solutions of ethyleneimine (item 3) and substances of item 14 of marg. 401, shall not be filled beyond 95% of their capacity.
8. *Special regulations applicable to Class V: Corrosive substances*
- 8.1 *Use*  
All substances of marg. 501 or covered by a collective heading may, if their physical state so permits, be carried in tank containers.
- 8.2 *Construction*
- 8.2.1 The shells of tank containers intended for the carriage of bromine (item 14) shall be designed for a pressure of 21 kg/cm<sup>2</sup> (manometric pressure). They shall be fitted with a lead lining not less than 5 mm thick.
- 8.2.2 The shells of tank containers intended for the carriage of substances of items 1 (a) and (b), 2 (a) and (b), 6 (a), 7, 8, 9, 21 (a) and 23 shall be designed for a pressure of 10 kg/cm<sup>2</sup> (manometric pressure).
- 8.2.3 The shells of tank containers intended for the carriage of substances referred to in 8.1, other than those listed in 8.2.1 and 8.2.2, shall be designed for a pressure of 4 kg/cm<sup>2</sup> (manometric pressure) and shall be so constructed that they can be discharged at a pressure of not less than 3 kg/cm<sup>2</sup> (manometric pressure).
- 8.2.4 The shells of tank containers intended for the carriage of aqueous solutions of hydrogen peroxide (item 41) shall meet the requirements of 5.2.
- 8.3 *Items of equipment*
- 8.3.1 All openings in the shells of tank containers intended for the carriage of hydrofluoric acid (item 6) and bromine (item 14) shall be above the surface level of the liquid; no piping or pipe connections shall pass through the walls of the shell below the surface level of the liquid. The closures shall be capable of being effectively protected by a metal cover.
- 8.3.2 The shells of tank containers intended for the carriage of stabilised sulphur trioxide (item 9) shall be thermally insulated and be fitted with a heating device on the outside. Shells may be of the bottom-discharge type. In this case, the shell-discharge fittings shall include two mutually independent shut-off devices mounted in series, the first being a quick-closing internal stop-valve of an approved type and the second a sluice-valve, placed at each end of the discharge pipe. A blank flange or another device providing the same measure of security shall also be fitted to the outlet of each external sluice-valve.

8.3.3 The shells of tank containers intended for the carriage of hypochlorite solutions (item 37) and of aqueous solutions of hydrogen peroxide (item 41) shall be so designed as to prevent the entry of foreign matter, the leakage of liquid and the development of any dangerous excess pressure in the shell.

8.4 *Type approval*

No special requirements.

8.5 *Tests*

8.5.1 The shells of tank containers intended for the carriage of substances referred to in 8.1 shall be tested initially and periodically at a pressure of 4 kg/cm<sup>2</sup> (manometric pressure).

8.5.2 The pressure test for tank containers intended for the carriage of stabilised sulphur trioxide (item 9) shall be repeated every two and one half years.

8.5.3 The condition of the lead lining of the shells of tank containers intended for the carriage of bromine (item 14) shall be checked every year by an approved expert, who shall inspect the inside of the shell.

8.6 *Marking*

In addition to the particulars prescribed in 1.6.1 and 1.6.2, the following particulars shall be marked on tank containers intended for the carriage of bromine (item 14): the maximum permissible net load in kg and the date (month, year) of the most recent internal inspection of the shell.

8.7 *Operation*

The shells of tank containers intended for the carriage of sulphuric acid [item 1 (c)] shall not be filled beyond 95% of their capacity, those intended for the carriage of stabilised sulphur trioxide (item 9) shall not be filled beyond 88% of their capacity and those intended for the carriage of bromine (item 14) shall be filled to not less than 90% and not more than 92% of their capacity, or to 2.86 kg per litre of capacity.

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[OFFICIAL ENGLISH TRANSLATION<sup>1</sup> — TRADUCTION ANGLAISE OFFICIELLE<sup>2</sup>]

ADDITIONAL PROTOCOL<sup>3</sup> TO THE INTERNATIONAL CONVENTIONS CONCERNING THE CARRIAGE OF GOODS BY RAIL (CIM)<sup>4</sup> AND THE CARRIAGE OF PASSENGERS AND LUGGAGE BY RAIL (CIV),<sup>5</sup> SIGNED AT BERNE ON THE 25th FEBRUARY, 1961

The undersigned plenipotentiaries have agreed to the following provisions:

I

1. States which have not signed the Conventions of 25th October, 1952,<sup>6</sup> and 25th February, 1961,<sup>4, 5</sup> or territorial parts of such States on whose railway

<sup>1</sup> Translation supplied by the Government of the United Kingdom.

<sup>2</sup> Traduction fournie par le Gouvernement du Royaume-Uni.

<sup>3</sup> Came into force on 1 July 1964 in respect of the following States in whose name an instrument of ratification or an application for accession or a notification of application by internal legislation had been deposited with the Government of Switzerland (i.e., six months before the date fixed for the entry into effect of the 1961 "CIM" and "CIV" Conventions), in respect of chapter I, and on 1 January 1965 in respect of chapters II through IV, in accordance with the fifth paragraph of chapter IV and with paragraph 2 of Protocol A dated 29 April 1964, drawn up by the Diplomatic Conference convened with a view to bringing into force the International Conventions "CIM" and "CIV" of 25 February 1961:\*

State	Date of deposit of the instrument of ratification, of the application for accession (a), or of the notification of application by internal legislation (n)	State	Date of deposit of the instrument of ratification, of the application for accession (a), or of the notification of application by internal legislation (n)
Austria .....	10 August 1964	Morocco .....	24 September 1963 a
Belgium .....	17 March 1964	Netherlands .....	26 September 1963
Bulgaria .....	29 April 1963	Norway .....	9 August 1963
Czechoslovakia .....	14 March 1963	Poland .....	4 November 1963
Denmark .....	13 September 1961	Portugal .....	4 December 1963
Finland .....	14 April 1964	Romania .....	14 August 1962
France .....	30 May 1962	Spain .....	19 February 1963
German Democratic Republic ..	20 November 1964 n	Sweden .....	27 June 1963
Germany, Federal Republic of ..	24 December 1964 n	Switzerland .....	25 July 1962
Hungary .....	29 March 1962	United Kingdom of Great Britain and Northern Ireland .....	9 April 1964
Italy .....	12 November 1963	Yugoslavia .....	21 February 1964
Liechtenstein .....	24 October 1963		
Luxembourg .....	26 November 1964		

Subsequently, instruments of ratification to the Additional Protocol or applications for accession thereto were deposited with the Government of Switzerland on:

State	Date of deposit of the instrument of ratification or of the application for accession (a)	State	Date of deposit of the instrument of ratification or of the application for accession (a)
Tunisia .....	23 January 1964 a	Ireland .....	13 May 1969 a
(With effect from 21 November 1965.**)		(With effect from 1 February 1970.***†)	
Syrian Arab Republic .....	24 April 1964 a	Greece .....	29 July 1969
(With effect from 7 May 1965.** †)		(With effect from 1 September 1969.***)	
Turkey .....	31 January 1966	Germany, Federal Republic of ..	18 August 1972 a
(With effect from 1 March 1966.***)		(With effect from 1 April 1973.** † In respect of chapters II through IV of the Additional Protocol.)	
Iran .....	2 August 1966 a	German Democratic Republic ..	18 August 1972 a
(With effect from 9 March 1968.**)		(With effect from 1 April 1973.** In respect of chapter II, numbers 2 and 3, and chapters III and IV of the Additional Protocol.)	
Algeria .....	14 November 1968 a		
(With effect from 30 October 1969.**)			

lines the Conventions of 25th October, 1952, are applied, may notify the Swiss Government that they have adopted by internal legislation the provisions of the Conventions of 1961 which they will apply according to the rules of their constitution.

2. In the case of such notification being given the effect shall be as follows:

(a) The provisions of the Conventions of 1961 shall apply to the relations between the Contracting States and the States or territorial parts of States referred to in paragraph 1 above which have given such notification, on the expiry of a period of thirty days from the date of receipt of the notification by the Swiss Government if the Conventions have come into force or, if not, from the date of their coming into force.

(b) The Swiss Government shall record the date of receipt of the notification and shall inform the States which are parties to the Conventions of 1961 and the States or territorial parts of States which have availed themselves of the provisions of paragraph 1 above.

(c) The States or territorial parts of States referred to in paragraph 1 above shall have the same rights and duties as the States which have ratified the Conventions of 1961 or have adhered to them, provided:

That they may be represented in the conferences and sessions of the Committees by delegates and experts from the railway administrations, who will act in an advisory capacity; their opinions on the proposals shall be expressed separately and recorded in the minutes;

That until such time as a new set of regulations is adopted, they shall not exercise the right of opposition laid down in Article 69 (3) and (4) of CIM and Article 68 (3) of CIV, and shall not hold themselves bound to comply with the decisions of the Contracting States concerning the introduction of new rules, but may make an autonomous decision to adopt such rules and to introduce them by internal legislation and apply them in accordance with the provisions of their constitution.

3. It shall not be sufficient, for the application of the provisions of Chapter I of this Additional Protocol, that only one of the States or territorial parts of States concerned should declare its desire to take advantage of the offer of the signatory States contained in paragraph 1 above.

The declarations made in accordance with paragraph 1 above must agree; they shall bind each State or territorial part of a State concerned, without prejudice to the provisions of Article 68 of CIM and Article 67 of CIV.

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(Footnote 3 continued from p. 392)

\* See p. 400 of this volume.

\*\* One month after the date of notification by the Government of Switzerland to the Contracting States that the application for accession was deemed to be accepted, in accordance with article 67 (3) of the CIM Convention and 66 (3) of the CIV Convention.

\*\*\* Simultaneously with the CIM and CIV Conventions, in accordance with Protocol A of 29 April 1964.

† See p. 399 of this volume for the texts of the reservations and declarations made upon accession.

<sup>4</sup> See p. 5 of this volume.

<sup>5</sup> United Nations, *Treaty Series*, vol. 1101, p. 2.

<sup>6</sup> *Ibid.*, vol. 241, p. 336, and vol. 242, p. 2.

## II

1. In order to make the provisions of the 1961 Conventions binding on users under the laws of the United Kingdom of Great Britain and Northern Ireland, as regards the lines of territorial parts of non-signatory or non-adhering States, the Government of the United Kingdom shall have the right to derogate from the provisions of these Conventions by inserting, in respect of traffic from the United Kingdom, a reference to this Additional Protocol in the printed forms of consignment note (CIM), international ticket and luggage registration voucher (CIV).

2. Having regard to the fact that in the United Kingdom the laws relating to transport do not contain any obligation to publish tariffs or to apply them uniformly to users, it is agreed that:

- (a) The provisions of CIM shall not apply in the United Kingdom in so far as they contain an obligation to publish tariffs and to apply them uniformly to users;
- (b) The carriage charges and supplementary charges which the railway is authorised to make in the United Kingdom shall be applicable there to international traffic governed by CIM.

3. Until a special appendix to Annex I to CIM containing special provisions for the rail-sea carriage of dangerous goods between the Continent and the United Kingdom is agreed and comes into force, dangerous goods carried under CIM to or from the United Kingdom shall comply with the provisions of Annex I and also with the United Kingdom conditions for the carriage of dangerous goods by rail and by sea.

## III

The Government of the French Republic reserves its position with regard to the provisions of paragraph 3 of Article 9 of CIM concerning private tariff agreements and declares that, so far as it is concerned, these provisions can under no circumstances take precedence over those of the Treaty setting up the European Coal and Steel Community,<sup>1</sup> nor over those to be laid down within the framework of the common transport policy envisaged in Article 74 of the Treaty of 25th March, 1957, setting up the European Economic Community.<sup>2</sup>

## IV

This Protocol completing the 1961 Conventions shall remain open for signature until 1st May, 1961.

It shall require ratification.

States which have not signed this Protocol before that date and States becoming parties to the above-mentioned Conventions through the application of Article 67 of the CIM and Article 66 of the CIV of 1961 may adhere to this Protocol by notification.

<sup>1</sup> United Nations, *Treaty Series*, vol. 261, p. 140.

<sup>2</sup> *Ibid.*, vol. 298, p. 3.

Instruments of ratification or notifications of adherence shall be deposited with the Swiss Government.

Chapter I of this Protocol shall come into force six months before the date fixed for the entry into effect of the 1961 Conventions.

IN WITNESS WHEREOF, the plenipotentiaries hereinafter mentioned, furnished with full powers which have been found to be in good order and proper form, have signed this Protocol.

DONE at Berne, this twenty-fifth day of February, one thousand nine hundred and sixty-one, in one original, which shall be deposited in the archives of the Swiss Confederation and an authentic copy of which shall be sent to each of the Parties.

For Austria:

Dr. KREMPER

For Belgium:

F. SEYNAEVE

For Bulgaria:

S. DRAGOMIROV

For Denmark:

Th. JENSEN

For Spain:

Marquis de MIRAFLORES

For Finland:

OSMO ORKOMIES

For France:

E. DENNERY

For Greece:

A. HART-SOUTZOS

For Hungary:

SKONDA ÖDÖN

For Italy:

LUIGI BRANCA

For Lebanon:

RAÏF ABILLAMA

For Liechtenstein:

A. HILBE

For Luxembourg:

A. CLEMANG

For Norway:

HENR. A. BROCH



For the Netherlands:

H. E. SCHEFFER  
For the Kingdom in Europe

For Poland:

BATKOWSKI

For Portugal:

MARIO DIAS TRIGO

For Rumania:

G. NISTORAN

For the United Kingdom of Great Britain and Northern Ireland:

J. S. ROOKE  
A. H. KENT

For Sweden:

CLAS NORDSTRÖM

For Switzerland:

SCHALLER

For Czechoslovakia:

JAN OBHLÍDAL

For Turkey:

H. UGAN

For Yugoslavia:

V. NIKOLIĆ

RESERVATIONS AND DECLARATIONS  
MADE UPON ACCESSION

*FEDERAL REPUBLIC OF GERMANY*

[TRANSLATION — TRADUCTION]

[*For the text of the declaration, see p. 338 of this volume.*]

*IRELAND*

[*For the text of the reservation and declaration, see p. 338 of this volume.*]

*SYRIAN ARAB REPUBLIC*

[TRANSLATION — TRADUCTION]

[*For the text of the reservation, see p. 338 of this volume.*]

[OFFICIAL ENGLISH TRANSLATION<sup>1</sup> — TRADUCTION ANGLAISE OFFICIELLE<sup>2</sup>]

**PROTOCOL A<sup>3</sup> DRAWN UP BY THE DIPLOMATIC CONFERENCE  
CONVENED WITH A VIEW TO BRINGING INTO FORCE THE  
INTERNATIONAL CONVENTIONS OF 25th FEBRUARY, 1961,  
CONCERNING THE CARRIAGE OF GOODS BY RAIL (CIM)<sup>4</sup>  
AND THE CARRIAGE OF PASSENGERS AND LUGGAGE BY  
RAIL (CIV)<sup>5</sup>**

In accordance with the provisions of Article 66 of the International Convention concerning the Carriage of Goods by Rail (CIM)<sup>4</sup> and of Article 65 of the International Convention concerning the Carriage of Passengers and Luggage by Rail (CIV),<sup>5</sup> signed at Berne on 25th February, 1961, and concluded between

Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, Finland, France, Greece, Hungary, Italy, Lebanon, Liechtenstein, Luxembourg, The Netherlands, Norway, Poland, Portugal, Rumania, Spain, Sweden, Switzerland, Turkey, the United Kingdom and Yugoslavia;

And on the invitation issued by the Swiss Federal Council to the High Contracting Parties, the undersigned plenipotentiaries met at Berne on 27th, 28th and 29th April, 1964.

After having communicated their full powers, found in good and due form, they took note of the declaration by the Swiss Government that the instruments of ratification of the two above-mentioned Conventions, which were examined and found correct, had been deposited with the Government of the Swiss Confederation by the following States and on the dates mentioned below:

1. Denmark, 13th September, 1961,
2. Hungary, 29th March, 1962,
3. France, 30th May, 1962,

<sup>1</sup> Translation supplied by the Government of the United Kingdom.

<sup>2</sup> Traduction fournie par le Gouvernement du Royaume-Uni.

<sup>3</sup> Came into force on 29 April 1964, in respect of the following States in whose names it had been signed on the said date without reservation as to ratification:

Belgium	Netherlands
Bulgaria	Norway
Czechoslovakia	Poland
Denmark	Portugal
Finland	Romania
France	Spain
Greece	Sweden
Hungary	Switzerland
Italy	Turkey
Liechtenstein	United Kingdom of Great Britain and Northern Ireland

Subsequently, instruments of ratification to Protocol A were deposited with the Government of Switzerland as follows with effect from the date of deposit:

<i>State</i>	<i>Date of deposit of the instrument of ratification</i>
Austria .....	21 October 1964
Luxembourg .....	26 November 1964
Yugoslavia .....	27 January 1965

<sup>4</sup> See p. 5 of this volume.

<sup>5</sup> United Nations, *Treaty Series*, vol. 1101, p. 2.

4. Switzerland, 25th July, 1962,
5. Rumania, 14th August, 1962,
6. Spain, 19th February, 1963,
7. Czechoslovakia, 14th March, 1963,
8. Bulgaria, 29th April, 1963,
9. Sweden, 27th June, 1963,
10. Norway, 9th August, 1963,
11. The Netherlands, 26th September, 1963,
12. Liechtenstein, 24th October, 1963,
13. Poland, 4th November, 1963,
14. Italy, 12th November, 1963,
15. Portugal, 4th December, 1963,
16. Yugoslavia, 21st February, 1964,
17. Belgium, 17th March, 1964,
18. The United Kingdom, 9th April, 1964,
19. Finland, 14th April, 1964.

The Conference, having established that more than fifteen States had deposited instruments of ratification with the Swiss Government, agreed upon the following provisions:

1. The International Conventions of 25th February, 1961, concerning the Carriage of Goods by Rail (CIM) and the Carriage of Passengers and Luggage by Rail (CIV), and the Additional Protocol of 25th February, 1961,<sup>1</sup> subject to the reservation set out in paragraph 2 below, shall enter into force on 1st January, 1965. The CIM and CIV Conventions of 25th October, 1952, including the Additional Protocols of 25th October, 1952, and 11th April, 1953,<sup>2</sup> shall be abrogated on the same date. In accordance with paragraph 2 of article 67 of the CIM and paragraph 2 of article 66 of the CIV of 1952, this abrogation shall also apply in respect of any of the contracting parties who do not ratify the Conventions of 25th February, 1961.

2. In accordance with Chapter IV of the Additional Protocol of 25th February, 1961, Chapter I of that Protocol, concerning the adoption and application of the Conventions, by internal legislation, in States which have not signed the Conventions of 25th October, 1952, and 25th February, 1961, or in territorial parts of such States, shall enter into force six months before the date laid down for the entry into force of the Conventions of 1961, that is to say on 1st July 1964.

3. Annex I (Regulations concerning the Substances and Articles not to be Accepted for Carriage or to be Accepted subject to Certain Conditions (RID)), Annex VII (International Regulations concerning the Haulage of Private Owners' Wagons (RIP)), and Annex VIII (International Regulations concerning the Carriage of Containers (RICO)) to the CIM of 1952, which are subject to a special procedure of revision and were therefore not included in the documents signed on

<sup>1</sup> See p. 392 of this volume.

<sup>2</sup> United Nations, *Treaty Series*, vol. 241, p. 336, and vol. 242, p. 2.

25th February, 1961, shall have effect as from 1st January, 1965, as Annexes I, VII and VIII to the CIM of 25th February, 1961, subject to the following modifications to conform with the CIM of 1961:

(a) *Regulations concerning the Substances and Articles not to be Accepted for Carriage or to be Accepted subject to Certain Conditions (RID)*

(i) Wording of the title to read:

“International Regulations concerning the Carriage of Dangerous Goods by Rail (RID)”.

(ii) Text of the Note to marginal 1 (6) to read:

“NOTE. The provisions of article 4, para. 2 of CIM are as follows:

“Para. 2. Two or more Contracting States may arrange, by agreement, that certain substances or articles not acceptable for carriage under the provisions of Annex I to this Convention will be accepted for international carriage between those States subject to certain conditions, or that the substances and articles specified in Annex I to this Convention will be accepted subject to conditions less onerous than those laid down in the said Annex.

Railways may also, by clauses in their tariffs, either accept certain substances or articles not acceptable for carriage under the provisions of Annex I to this Convention, or adopt conditions less onerous than those laid down in Annex I to this Convention for substances and articles accepted under the said Annex.

Such agreements and tariff clauses must be notified to the Central Office for International Railway Transport”.

(iii) Text of marginal 2 (4) to read:

“(4) In accordance with article 17 of the International Convention concerning the Carriage of Passengers and Luggage by Rail (CIV), the substances and articles of RID are excluded from carriage as luggage, unless the tariffs provide for exceptions.”

(iv) In marginals 45, 82, 119, 163, 196, 222, 315, 353, 390, 433, 466, 522, 613 and 719, the text of the reference in brackets to read:

“[art. 6, para. 10 (d) of CIM].”

(b) *International Regulations concerning the Haulage of Private Owners' Wagons (RIP)*

(i) Title page to read:

“International Convention concerning the Carriage of Goods by Rail (CIM) of 25th February, 1961”.

(ii) At top of pages 1 and 2<sup>1</sup> read:

“Annex VII to CIM  
(Article 60 (1) of CIM)”.

<sup>1</sup> See p. 329 of this volume.

(iii) In article 10 (1) and (2) read:

“in accordance with the provisions of article 45 of the CIM”.

(iv) Article 15 to be deleted.

(c) *International Regulations concerning the Carriage of Containers (RICO)*

(i) Title page to read:

“International Convention concerning the Carriage of Goods by Rail (CIM) of 25th February, 1961”.

(ii) At top of pages 1 and 2<sup>1</sup> read:

“Annex VIII to CIM  
(Article 60 (2) of CIM)”.

This Protocol shall remain open for signature until 1st November, 1964.

For States depositing their instruments of ratification after 1st November, 1964, the Conventions shall take effect on the first day of the second month following the month during which the Swiss Government shall have notified such deposit to the Governments of the Contracting States.

IN WITNESS WHEREOF, the plenipotentiaries have drawn up and signed this Protocol.

DONE at Berne, this twenty-ninth day of April, one thousand nine hundred and sixty-four, in a single original, which shall be deposited in the archives of the Swiss Confederation, and of which a certified copy shall be transmitted to each of the Parties.

For Austria:

(Unter Vorbehalt der Ratifikation)<sup>2</sup>

F. KREMLER

For Belgium:

C. ALVIN

For Bulgaria:

S. DRAGOMIROV NIKOLOV

<sup>1</sup> See p. 333 of this volume.

<sup>2</sup> Subject to ratification.

For Denmark:

TH. JENSEN

For Spain:

DE SANTA CRUZ DE INGUANZO

For Finland:

E. HELANIEMI

For France:

G. DE GIRARD DE CHARBONNIÈRE

For Greece:

S. VASSILICOS

For Hungary:

D. KUZSEL

For Italy:

GIUSEPPE SANTONI RUGIU

For Lebanon:

For Liechtenstein:

A. HILBE



For Luxembourg:

(Sous réserve de ratification)<sup>1</sup>

A. CLEMANG

For Norway:

DAG BRYN

For the Netherlands:

LÉON SAVELBERG

For Poland:

STÉFAN BATKOWSKI

For Portugal:

MÁRIO DIAS TRIGO

For Rumania:

W. DUMITRESCU

For the United Kingdom of Great Britain and Northern Ireland:

A. H. KENT

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<sup>1</sup> Subject to ratification.

For Sweden:

C. NORDSTRÖM

For Switzerland:

A. SCHALLER

For Czechoslovakia:

J. REZÀBEK

For Turkey:

S. BAYDUR

For Yugoslavia:

MARA RADIĆ

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[OFFICIAL ENGLISH TRANSLATION<sup>1</sup> — TRADUCTION ANGLAISE OFFICIELLE<sup>2</sup>]

**PROTOCOL B<sup>3</sup> DRAWN UP BY THE DIPLOMATIC CONFERENCE  
CONVENED WITH A VIEW TO BRINGING INTO FORCE THE  
INTERNATIONAL CONVENTIONS OF 25th FEBRUARY,  
1961, CONCERNING THE CARRIAGE OF GOODS BY RAIL  
(CIM)<sup>4</sup> AND THE CARRIAGE OF PASSENGERS AND LUG-  
GAGE BY RAIL (CIV)<sup>5</sup>**

On the occasion of the meeting at Berne on 27th, 28th and 29th April, 1964, of the Diplomatic Conference convened with a view to bringing into force the International Conventions of 25th February, 1961, concerning the Carriage of Goods by Rail (CIM)<sup>4</sup> and the Carriage of Passengers and Luggage by Rail (CIV),<sup>5</sup> signed at Berne on 25th February, 1961, and concluded between

Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, Finland, France, Greece, Hungary, Italy, Lebanon, Liechtenstein, Luxembourg, The Netherlands, Norway, Poland, Portugal, Rumania, Spain, Sweden, Switzerland, Turkey, the United Kingdom and Yugoslavia,

and on the invitation issued by the Swiss Federal Council to the High Contracting Parties;

The undersigned plenipotentiaries, after having communicated their full powers, found in good and due form, have agreed as follows:

Whereas in spite of the policy of economy pursued by the Central Office the maximum rates laid down in Annex V to CIM and Annex II to CIV for calculating the contributions of States to the expenses of the Central Office are not sufficient, by reason of constantly rising costs, to cover the necessary administrative expenditure of the Central Office,

<sup>1</sup> Translation supplied by the Government of the United Kingdom.

<sup>2</sup> Traduction fournie par le Gouvernement du Royaume-Uni.

<sup>3</sup> Came into force on 29 April 1964 in respect of the following States in whose name it had been signed on the said date without reservation as to ratification:

Belgium	Norway
Bulgaria	Poland
Czechoslovakia	Portugal
Denmark	Romania
Finland	Spain
France	Sweden
Greece	Switzerland
Hungary	Turkey
Liechtenstein	

Subsequently, instruments of ratification to Protocol B were deposited with the Government of Switzerland as follows, with effect from the date of deposit:

<i>State</i>	<i>Date of deposit of the instrument of ratification</i>
Austria .....	21 October 1964
Luxembourg .....	26 November 1964
United Kingdom of Great Britain and Northern Ireland ..	29 December 1964
Yugoslavia .....	27 January 1965
Netherlands .....	29 January 1965

<sup>4</sup> See p. 5 of this volume.

<sup>5</sup> United Nations, *Treaty Series*, vol. 1101, p. 2.

It has been decided

To levy an additional annual contribution not exceeding 0.45 gold francs per kilometre for each State, both for CIM and CIV,

To authorise the Administrative Committee to determine, on the first occasion in 1965, when approving the annual accounts for the financial year 1964, the contributions of the Contracting States within the maximum rates per kilometre laid down in the CIM and CIV Conventions of 25th February, 1961, and in this Protocol.

This Protocol shall remain open for signature until 1st November, 1964.

The application and official notification of this Protocol shall as and where appropriate be governed by the provisions of Chapter I of the Additional Protocol to the International Conventions concerning the Carriage of Goods by Rail (CIM) and the Carriage of Passengers and Luggage by Rail (CIV) of 25th February, 1961.<sup>1</sup>

IN WITNESS WHEREOF, the plenipotentiaries have drawn up and signed this Protocol.

DONE at Berne, this twenty-ninth day of April, one thousand nine hundred and sixty-four, in a single original, which shall be deposited in the archives of the Swiss Confederation, and of which a certified copy shall be transmitted to each of the Parties.

For Austria:

(Unter Vorbehalt der Ratifikation)<sup>2</sup>

F. KREMLER

For Belgium:

C. ALVIN

For Bulgaria:

S. DRAGOMIROV NIKOLOV

For Denmark:

TH. JENSEN

<sup>1</sup> See p. 392 of this volume.

<sup>2</sup> Subject to ratification.

For Spain:

DE SANTA CRUZ DE INGUANZO

For Finland:

E. HELANIEMI

For France:

G. DE GIRARD DE CHARBONNIÈRE

For Greece:

S. VASSILICOS

For Hungary:

D. KUZSEL

For Italy:

(Sous réserve de ratification)<sup>1</sup>

GIUSEPPE SANTONI RUGIU

For Lebanon:

For Liechtenstein:

A. HILBE

---

<sup>1</sup> Subject to ratification.

For Luxembourg:

(Sous réserve de ratification)<sup>1</sup>

A. CLEMANG

For Norway:

DAG BRYN

For the Netherlands:

(Sous réserve de ratification)<sup>1</sup>

LÉON SAVELBERG

For Poland

STÉFAN BATKOWSKI

For Portugal:

MÁRIO DIAS TRIGO

For Rumania:

W. DUMITRESCU

For the United Kingdom of Great Britain and Northern Ireland:

(Sous réserve de ratification)<sup>1</sup>

A. H. KENT

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<sup>1</sup> Subject to ratification.

For Sweden:

C. NORDSTRÖM

For Switzerland:

A. SCHALLER

For Czechoslovakia:

J. REZÀBEK

For Turkey:

S. BAYDUR

For Yugoslavia:

MARA RADIĆ

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TERMINATION OF THE INTERNATIONAL CONVENTION OF  
25 FEBRUARY 1961 CONCERNING THE CARRIAGE OF  
GOODS BY RAIL (CIM)<sup>1</sup>

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*(Note by the Secretariat)*

The Government of Switzerland registered on 8 August 1978 the International Convention concerning the carriage of goods by rail (CIM) concluded at Bern on 7 February 1970.<sup>2</sup>

Upon the coming into force, on 1 January 1975, of this latter Convention, the preceding CIM Convention of 25 February 1961 was rendered void as of that date, even in respect of Contracting States which do not ratify the new Convention, in accordance with article 69 (2) of the CIM Convention of 25 February 1961.

*(8 August 1978)*

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<sup>1</sup> See p. 5 of this volume.

<sup>2</sup> United Nations, *Treaty Series*, vol. 1101, p. 164.