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DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
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UNITED STATES GOVERNMENT MASTER SPECIFICATION FOR
BATTLESHIP LINOLEUM

FEDERAL SPECIFICATIONS BOARD SPECIFICATION No. 209

This specification was officially adopted by the Federal Specifications Board on July 30, 1924, for the use of the Departments and Independent Establishments of the Government in the purchase of battleship linoleum.

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I. GRADES

Battleship linoleum shall be graded according to thickness, as light, medium, and heavy. Light battleship, average thickness 0.142 inch, is commonly known as "A" gauge; medium battleship, average thickness 0.187 inch, as three-sixteenths inch; and heavy battleship, average thickness 0.235 inch, as 6-mm linoleum.

II. MATERIAL AND WORKMANSHIP

Battleship linoleum consists of oxidized linseed oil, fossil or other resins, and rosin intimately mixed with ground cork and pigments and pressed on an unpainted burlap backing. Some wood flour may be added in the manufacture of gray and other light colors to obtain the proper shade.

III. GENERAL REQUIREMENTS

1. COLOR AND FINISH

The surface shall be smooth and free from streaks, spots, indentations, cracks, and protruding particles of cork. The color and finish shall match a sample mutually agreed upon by buyer and seller.

2. WIDTH

Seventy-two inches $\pm 1/16$ inch, unless otherwise specified.

3. BURLAP BACKING

(a) **KEY.**—The burlap shall be deeply embedded and keyed to the linoleum mix so as to be partially concealed in it. A pull of not less than 6 pounds shall be required to separate it from the linoleum mix on a strip 3 inches wide.

(b) **FINISH.**—The burlap shall not be painted.

4. INDENTATION

The linoleum shall not show an indentation of more than 0.010 inch one hour after it has been subjected to a pressure of 80 pounds applied for a period of 60 seconds on a flat-ended cylindrical steel bar 0.282 inch in diameter.

IV. DETAIL REQUIREMENTS

1. SEASONING

The linoleum shall be thoroughly seasoned. The surface of a clean, fresh cut made at an angle of 45° in the case of light battleship shall show no difference in color or grain between the outer edges and the

center. In the case of medium battleship a difference in color in the center not to exceed one-fifth of the thickness of the cut surface will be permitted. In the case of heavy battleship a difference in color not to exceed one-third of the thickness of the cut surface will be permitted.

2. THICKNESS

Kind	Minimum	Maximum
Light.....	<i>Inch</i> 0.137	<i>Inch</i> 0.147
Medium.....	.182	.192
Heavy.....	.230	.240

3. MINIMUM WEIGHT PER SQUARE YARD

	Pounds
Light.....	6.5
Medium.....	8.0
Heavy.....	10.5

4. PLIABILITY

There shall be no cracking or breaking when the linoleum is bent over the mandrels of the following diameters, respectively:

	Inches
Light.....	2
Medium.....	2½
Heavy.....	3

5. WATER ABSORPTION (24 HOURS AT 21° C. (70° F.))

	<i>Maximum absorption</i>	Per cent
Light.....		5½
Medium.....		4
Heavy.....		2½

V. METHOD OF INSPECTION AND TESTS

When inspection and tests are required, battleship linoleum will, in general, be sampled and tested by the following methods, but the purchaser reserves the right to use any additional information to determine whether the material conforms to the specifications.

1. SAMPLING

From each 10 rolls select 1 roll at random for sampling. Preferably from the inside end of the roll cut a sample approximately 14 inches wide and the full width of the roll. Carefully roll up the sample and transmit it to the laboratory for examination.

2. LABORATORY EXAMINATION

(a) COLOR AND FINISH.—Examine the sample and compare its color and general appearance with the sample mutually agreed upon for color and finish.

(b) SEASONING.—Cut the sample with a sharp knife at least one-half inch from an outside edge at an angle of 45° and observe the color and grain of the material showing at the cut edge.

(c) WIDTH.—Measure the width of the roll to the nearest one-sixteenth inch.

(d) THICKNESS.—Caliper the sample at 10 points equally spaced across the sample at least three-fourths inch from a cut edge with a micrometer having flat bearing surfaces at both contact points of not less than one-fourth inch in diameter. Average the readings.

(e) WEIGHT.—Cut a sample approximately 12 by 12 inches, measure accurately, and weigh to the nearest gram (15 grains). From the measurements and weight so obtained calculate the weight per square yard.

(f) PLIABILITY.—Cut two strips 2 inches wide and 8 inches long longitudinally and two strips of the same size transversely of the roll and bring to a temperature of 21° C. (70° F.) to 25° C. (77° F.) by exposure to these conditions for two to two and one-half hours. Now bend each strip with the burlap on the inside at approximately its center over bars or mandrels of the specified diameter through an arc of 180° and at a uniform speed in approximately five seconds time. A 3-inch mandrel shall be used for heavy, a 2½-inch mandrel for medium, and a 2-inch mandrel for light battleship linoleum.

(g) KEYING OR BURLAP-STRIPPING TEST.—Take two strips of the linoleum 3 inches wide and 6 inches long, one in the direction of the warp of the burlap and one in the direction of the filling. Break the linoleum about 1 inch from the end so as not to injure the burlap but cutting part way through from the face and bending back. Now fasten either end and strip the burlap from it at a rate of approximately 12 inches per minute by steadily pulling on the other end at right angles to the back. The temperature during the test shall be between 21° C. (70° F.) and 25° C. (77° F.), and the pulling may be done in any suitable testing machine.

(h) INDENTATION.—Cut five pieces at least 2 inches across from the sample and bring to a temperature of 21° C. (70° F.) to 25° C. (77° F.) by keeping at this temperature for two to two and one-half hours. Support the disks by a smooth steel plate and apply a pressure of 80 pounds to the upper surface for a period of 60 seconds by means of a flat-ended cylindrical steel bar 0.282 inch in diameter. The bar shall be supported in a frame in such a manner as to insure

the face of its foot being parallel to the surface of the linoleum. The edges of the face of the bar in contact with the linoleum shall be buffed smooth to prevent cutting the linoleum. The load shall be lowered gently until its entire weight presses upon the linoleum, but in no case shall the load be dropped upon the linoleum.

After 60 seconds the load shall be removed and the indentation immediately measured, and one hour after the removal of the load the indentation shall again be measured, when it shall not exceed 0.010 inch. If the depth exceeds this amount, the linoleum shall be rejected. The surface of the linoleum shall show no sign of being broken or cut, and if such occurs, even though the indentation does not exceed 0.010 inch, the material shall be rejected.

In case of dispute umpire tests shall be run at exactly 21° C. (70° F.).

(i) WATER ABSORPTION.—Cut two samples 6 by 3 inches, remove the burlap backing, and buff the rough surface, finishing with No. 00 sandpaper or other suitable means until the average thickness of the sample is as follows:

	Inch
Heavy battleship-----	0.205
Medium battleship-----	.142
Light battleship-----	.097

Weigh the samples and immerse them in fresh tap water at a temperature of 21° C. (70° F.) to 25° C. (77° F.) for 24 hours. At the end of this period remove the samples and dry the surfaces and edges between blotting or filter paper. Two minutes after the sample has been removed from the water, weigh. Calculate the increase in weight in percentage.

VI. PACKING AND MARKING

Battleship linoleum shall be put up in rolls containing one continuous piece 20 to 30 yards long. It shall be tightly wound on cores or mandrels. The back of each piece of the linoleum shall be stamped at least at the ends and center with the name or trade-mark of the manufacturer and the grade of the goods. The rolls shall be wrapped in heavy paper, securely tied or otherwise fastened, plainly labeled with the name of the manufacturer, the thickness of the goods, and the yardage, and shall be packed in crates of sufficient strength to withstand ordinary handling during transportation.

VII. ADDITIONAL INFORMATION

Linoleum covered by this specification is recommended for use on board ships and on the floors of hospitals, office buildings, and in similar cases where linoleum of very smooth finish, of minimum

porosity, and maximum durability is required. It should also be used when linoleum is desired for use under extreme moisture conditions.

VIII. GENERAL SPECIFICATIONS

No details.

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