DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

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DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

The Explanatory Note of the Synthetic Rubber Plants

B 0.342
1946

Nippon Carbide
Industrial Company, Ltd,
Uozu Works.

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Michishita Toyama

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

I. The History of the Synthetic Rubber Plants.

These plants are those ofthe chloroprene rubber genus, built in June, 1943, and owing to the several explosions and fires, they have since been showing the production mentioned below:

1943: 5.124 tons

1944: 26.663 tons

1945: 9.664 tons

Soon after the war, in August last year, they were closed.

II. The Outline of the Conversion and Utilization of the Equipments.

After the closing of the plants in August, 1945, we have been considering how to convert and utilize the equipments. Some of them have already baan removed and used for other purposes, some for producing drugs and medicines where they have been, and others are now under consideration in order to be used for producing living necessaries.

The details are as follows.

III. The Explanation about the Conversion and Utilization of the Equipments.

(a) First of all, we must relate about the processes and the systems in the plants. (See another paper showing the diagram of manufacturing processes.)

1st Process: Acetylene Generating

Crashed carbide is made to generate acetylene in the generator, which is now put in an acetylene holder, then is made to pass through the purifier, and thus it is separated from such impure substances as hydrogen phosphate and hydrogen sulfide. The chief equipments required are as follows.

1. Carbide crasher

U 10342

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

2. Acetylene generator

3. Acetylene tank

4. Acetylene purifier

2nd Process: Mono-vinyl-acetylene Manufacturing

By leading purified acetylene gas into the reaction vessel No. 1 which contains a catalyst, we produce mono-vinyl acetylene containing such high polymer as divinyl acetylene, which we wash, dehydrogenize, separates from high polymer by means of a condenser, and thus we can make mono-vinyl acetylene separated, as liquid.

The chief equipments required are as follows.

1. Reaction vessel No. 1

2. Coolers

3. M.V.A vessel

4. M.V.A distillar

5. Refrigenerator

3rd Process: Chloroprene manufacturing

The liquid separated by the 2nd process is made into chloroprene by the reaction lasting for several hours, of the three substances, the catalysts, hydrochloric acid, and the said liquid, when they are put together in the reaction vessel No. 2.

The chief equipments required are as follows.

1. Reaction vessel No. 2

2. C.P vessel

3. C.P distiller

4. Refrigerator

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

4th Process: Polymerizing

Chloroprene is polymerized, after it is distilled in a vacuum evaporator, and is mixed with stabilizing material in a polymerizing tank.

The chief equipment required are as follows.

1. Polymerizer and its tank
2. Vacuum pump
3. Vacuum evaporator

5th Process: Finished Goods Manufacturing

The polymerized materials are made finished goods by means of a rolling machine. Besides, there are other accessory equipments, such as electrolyzers of water, synthesizing plants of hydrochloric acid, regenerating plants of catalyst, and boilers.

(b) The Conversion and Utilization of the Equipments.

(1) The manufacturing of drugs and medicines.

As shown in another paper No. 1, such medicine as sulfanilyl guanidin, Belphenine or Benzylacetophenylthiocarbamide, which are now being manufactured by the converted equipments, have both been recognized as the best in Japan, from health preservation point of view. We have already been given permission to manufacture them by the Welfare Office, and are urged to have rapid increase in production. Above all, the Belphenine (insect powder) production will reach as far as the 70 percents of all products in Japan, we expect. Sulfanyl guanidine, which is our own wonderful binding medicine, is second to none in Japan, and quite indispensable.

(2) Synthetic ethyl alcohol manufacturing.

Formerly the materials of 'sake' distilling consisted of only our stand

01342

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

food. But in view of the present food shortage, instead of using rice and wheat, we are trying to produce acetone and acetaldehyde out of carbide, with which we can manufacture ethylalcohol synthetically. The process is to be done by the acetylene generator which is used for producing synthetic rubber, and by the refregenerators and the equipments for mono-vinylacetylene production and the like. The test has already been done, and the regular plants are now under construction.

(3) Compressed acetylene manufacturing.

By making use of the surplus acetylene, we are planning to manufacture solution acetylene which is now in urgent need. It increases the repairing capacity of the equipments for Calcium Cyanamide. Thus we are preparing for more production of the said fertilizer.

(4) Rubber goods production.

Rubber boots are necessaries of life here in this district, because for the most part of the year they have rainy or snowy days. So to fill the shortage of their boots means great contribution to the recovery of Japan's economy, directly or indirectly. We have already joined the Rubber Controlling Association and have been receiving natural rubber ration', to make boots and other goods by using the rolling machine and its attached equipments. We already set the additional equipments as much as necessary.

(5) Frozen food manufacturing.

With refrigerators to be used for another purpose, we are planning to keep fish frozen. This has long been desired earnestly by the fishermen's associations here, because our plants are situated near the fishing port, and the storing of foodstuffs are very important nowadays.

(6) Saccharine production.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

By command of the Science Bureau in Education Office, we have been doing the 'Application of researching work of manufacturing saccharine by electric oxidation', by using reaction vessels and so on. Just when the sweet things are wanting, we are steadily planning to have big production positively, by an epoch-making method above mentioned.

As we have stated above, we have been striving to answer the private demands since the war-end, using the idle equipments of the synthetic rubber plants, wishing to be an aid to the reconstruction of Democratic Japan.

In order to achieve our purposes, we have been using all the equipments available and have bought additional machines and utensils needed for the conversion of the idle equipments. What came to hand have already been set in their respective places.

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DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

UTILIZATION, CONDITION OF MACHINES UNDER THE INTERIM REPARATION .

Nov. 1946, Investigate.

Uozu works, Nippon Carbide Industrial Co. Ltd.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

These machines are all made in Japan.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 1 Machine list of Acetylene Gener-

Number	Closed Machine		Converted Machine		How have been working	
	Name	Amount	Name	Amount	Working plant Name	Use
1			✓ Brake crusher	1	Carbide material plant	For Coke
2			✓ Motor 15 HP	1	"	"
3	Bucket conveyer	1				
4	Roll crusher	1				
5	Motor 25 HP	1				
6			✓ Winch	1	Limestone plant	For Limest
7			✓ Motor 15 HP	1	"	"
8			✓ Hand winch	1	Carbide plant	For work
9	Trolley block	1				
10	Acetylene generator	1				
11	Motor 15 HP	1				
12	Acetylene generator	1				
13	Motor 5 HP	1				
14			✓ Pump	1	Salt plant	For salt
15			✓ Motor 2 HP	1	"	"
16	Pump	1				
17	Motor 2 HP	1				
18	Head tank	1				
19	"	1				
20			✓ Acetylene holder	1	Salt plant	For salt

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 1 Machine list of Acetylene Generating Plant

Converted Machine _ Now have been working

ne	Amount	Working plant Name	Use	Condition of machine working	Remark for converting
e crusher	1	Carbide material plant	For Cokes crushing	good	At moving position
or 15 HP	1	"	"	"	"
ch	1	Limestone plant	For Limestone wind up	"	"
or 15 HP	1	"	"	"	"
winch	1	Carbide plant	For work repairing	"	"
P	1	Salt plant	For salt making	"	At intact position
or 2 HP	1	"	"	"	At moving position
ylene holder	1	Salt plant	For salt making	"	At moving position

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

lene Generating Plant

n working

	Use	Condition of machine working	Remark for converting	Condition of machine	Note
for Cokes crushing		good	At moving position	1	
	"	"	"	1	
				1	
				1	
				1	
for Limestone wind up		"	"	1	
	"		"	1	
for work repairing		"	"	1	
				1	
				2	By the parts breaking
				1	
				2	By the parts breaking
				1	
for salt making		"	At intact position	2	By the parts breaking
	"		At moving position	1	
				2	By the jacket beaking
				1	
				1	
				1	
for salt making		"	At moving position	1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.2 Machine list of A

Closed Machine			Converted Machine-low hav		
Number	Name	Amount	Name	Amount	Working plant Nam which settled
21	Purifyer	1			
22	"	1			
23	"	1			
24	Safty by water-seale	1			

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.2 Machine list of Acetylene purifyer.

Converted Machine-Now have been working

Name	Amount	Working plant Name which settled	Use	Condition of machine working	Remark I converti

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

list of Acetylene purifyer

ine-Now have been working

plant Name settled	Use	Condition of machine working	Remark for converting	Condition of machine	Use Note
				1	
				1	
				1	
				1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 3 Machine list of first pump room

Number	Closed Machine				Working plant	Name	Use
	Name	Amount	Name	Amount			
25	[illegible]		Pump	1	First pump room		For formaldehyde Belphenine Acetanilide anilyl gua
26	Pump	1					
27			Motor 20 HP	1	"		For formaldehyde, Acetanilyl guanid
28	Motor 20 HP	1					

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 3 Machine list of first pump room

Name	Amount	Working plant Name	Use	condition of machine working	Remark for converting
Pump	1	First pump room	For farmacy-Belphenint, Acetanilid sulfanilyl guanidine	good	At intact position
Motor 20 HP	1	"	For farmacy-Belphenine, Acetanilid, Sulfanilyl guanidine	"	At intact position

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

mp room

Use	condition of machine working	Remark for converting	condition of machine	note
r farmacy- lphenine, etanilid sulf- liyl guanidine	good	At intact position	1	
			1	
r farmacy-Belpheni- ,Acetanilid,sulfani- l guanidine	"	At intact position	1	
			1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 4 Machine list of Syntheti

Number	Closed Machine Name	Amount	Name	Amount	Converted Machine-Now have been wo Workingplant Name	Use
29	Gas meter	1				
30	Acetylene blower	1				
31			Motor 30 H.P	1	Sulphanlyl guanidine plant	for farm lyl gu
32	Accumlator	1				
33	"	1				
34	Pre-heater for Acetylen	1				
35	Tank	1				
36			Pump	1	Polymerizing plant	For farm Belphenl
37			Motor 2 H.P	1	"	"
38	Flow meter	1				
39	Orifice flow meter	1				
40	"	1				
41	"	1				
42	"	1				
43	"	1				
44	"	1				
45	"	1				
46	"	1				
47	First catalyst holder with water jachet	1				
48		1				
49	Reaction vessel No.1 with water jacket	1				
50	"	1				
51	"	1				

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 4 Machine List of Synthesizing Plant

Converted Machine-Now have been working

unt	Name	Amount	Workingplant	Name	Use	Condition of Machine working	Remark for coming
Motor	30 H.P	1	Sulphanlyl guanidine plant		for farmacy-Sulphanlyl guanidine	good	At moving posi
Pump		1	Polymerizing plant		For farmacy-Belphenine	good	At moving posi
Motor	2 H.P	1	"		"	"	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

ynthesizing Plant

been working

Use	Condition of machine working	Remark for converting	Condition machine	Note
			2	By indicate poor
			2	By unbalance
for farmacy-Sulphanalyl guanidine	good	At moving position	1	
			1	
			1	
			1	
			1	
for farmacy-elphenine	good	At moving position	1	
"	"	"	1	
			2	By inaccuracy
			2	"
			2	"
			2	"
			2	"
			2	"
			2	"
			2	"
			2	"
			1	
			1	
			1	
			1	
			1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 4 Machine list of Synthesizi

Number	Closed Machine				Converted Machine - Now have been			
	Name	Amount	Name	Amount	Working plant Name		Use	
52	Reaction vessel No.1 with water jacket	1						
53	"	1						
54	"	1						
55	"	1						
56	"	1						
57	"	1						
58	"							
59			Pump	1	Sulfanilylguanidine plant		Farmacy-S guanidine	
60			"	1	"		"	
61			"	1	"			
62	Pump	1						
63			Pump	1	Refigerating plant of laboratory		For form saccharin	
64			Motor	1	Electric plant		Now repa	
65			"	1	"		"	
66			"	1	Regenerating plant of Catalyst		For farm Acetanil	
67			"	1	Deposit by War		-	
68			"	1	Refigierating plant of laboratory		For farm Alcohol,	
69	Spare reaction vessel No.1	1						
70	Counter Shaft	1	Counter shaft	5	Synthesizing plant of Hydrochloride acid		For fa Belphen	
71	Motor 7.5 H.P	1						

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 4 Machine list of synthesizing plant

Converted Machine - Now have been working

Name	Amount	Working plant Name	Use	Condition of machine work -ing	Remark for convert
Pump	1	Sulfanilylguanidine plant	Farmacy-Sulfanilyl guanidine	good	At moving resition
"	1	"	"	"	"
"	1	"	"	"	"
Pump	1	Refigerating plant of laboratory	For formasy - saccharin	good	At moving position
Motor	1	Electric plant	Now repairing	wrong	"
"	1	"	"	"	"
"	1	Regenerating plant of Catalyst	For farmacy - Acetanilid	"	"
"	1	Deposit by War	-	-	-
"	1	Refigierating plant of laboratory	For farmacy - Alcohol,Saccharin	good	"
Counter shaft	5	Synthesizing plant of Hydrochloride acid	For farmacy - Belphenine	good	At moving position

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

thesizing plant

e been working

Use	Condition of machine work -ing	Remark for converting	Condition machine	Note
			1	
			1	
			1	
			1	
			1	
			1	
			1	
rmacy-Sulfanilyl uanidine	good	At moving position	1	
"	"	"	1	
"	"	"	1	
			1	
			1	
For formasy - saccharin	good	At moving position	2	By badness fan
Now repairing	wrong	"	2	By parch itself
"	"	"	2	"
For farmacy - Acetanilid	"	"	2	"
-	-	-	-	-
For farmacy - Alcohol,Saccharin	good	"	1	
			3	By breaking
For farmacy - Belphenine	good	At moving position	1	
			1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.4 Machine liet of Synthesizing

Number	Closed Machine		Converted Machine - Now have been wo				
72	Name	Amount	Name		Amount	Working plant Name	Use
73	Alkali washing tower	1					
73	Tank	1					
74			Pump		1	Sulfanilyl guanidine plant	For farm Sulfanil guanidin
75			Motor	2 H.P	1	"	"
76	Water cooling condensar No.1	1					
77	" No.2	1					
78	Heat exchanger No.3	1					
79	Brine washing tower	1					
80	Tank	1					
81	"	1					
82			Pump		1	Sulfanilyl guanidine plant	For farm Sulfanil guanidin
83			"		1	"	"
84			Motor	3 H.P	1	"	"
85			"	3 H.P	1	"	"
86	Brine cooling condenser No.4	1					
87	"	1					
88	Dryer for Acety -lene by solid calcium chloride	1					
89	"	1					

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.4 Machine liet of Synthesizing Plant

Converted Machine - Now have been warking

Name		Amount	Working plant Name	Use	Condition of machine work	Remark fpr conver-ing
Pump		1	Sulfenilyl guanidine plant	For farmacy - Sulfanilyl guanidine	good	At moving position
Motor	2 H.P	1	"	"	Wrong	"
Pump		1	Sulfenilyl guanidine plant	For farmacy - Sulfanilyl guanidine	good	At moving position
"		1	"	"	"	"
Motor	3 H.P	1	"	"	"	"
"	3 H.P	1	"	"	"	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

nthesizing Plant

ave been warking

	Use	Condition of machine work -ing	Remark for converting	Condition machine	Note
				1	
				2	By erosion greatly
ine	For farmacy - Sulfanilyl guanidine	good	At moving position	1	
	"	Wrong	"	2	Wrong
				1	
				1	
				1	
				1	
				1	
				1	
				1	
ine	For farmacy - Sulfanilyl guanidine	good	At moving position	1	
	"	"	"	1	
	"	"	"	1	
	"	"	"	1	
				1	
				1	
				1	
				1	
				1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Number	Closed Machine		Converted Machine - Now have been			
	Name	Amount	Name	Amount	Working plant name	Use
90	Ammonia cooling condenser No.5	1				
91	"	1				
92	"	1				
93	Receiver for crude monovinyl acetylene	1				
94	Receiver(Earthen ware pot)	1				
95	Evaporator for M.V.A	1				
96	"	1				
97	Rectifyer for M.V.A	1				
98	Dryer for pure M.V.A					
99	M.V.A condenser by brine cooling	1				
100	Receiver for pure M.V.A	1				
101	"	1				
102			Reaction vessel No.2	1	Synthesizing plant	Nakei -phar
103	Reaction vessel No.2	1				
104	"					
105			Reaction vessel No.2	1	Accelerator plant	Nakei Accel

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No 4

Converted Machine - Now have been working

Name	Amount	Working plant name	Use	Condition of machine working	Remark for converti
ction vessel	1	Synthesizing plant	Make for-mesul-pher	good	t intact position
tion vessel	1	Accelerator plant	Make for rubber Accelerator	good	t moving position

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

have been working

	Use	Condition of machine working	Remark for converting	Condition of machine	
				1	
				1	
				1	
				1	
				3	By breaking
				1	
				1	
				1	
				1	
				1	
				1	
				1	
ant	Makefor-limesul -phar	good	At intact position	2	By enamel fall off greatly
				3	"
				3	"
nt	Make for rubber Accelerator	good	At moving position	2	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Number	Closed Machine		Converted Machine - Now have h			
	Name	Amount	Name	Amount	Working plant name	Us
106	Reaction vessel No.2	1				
107			Counter shaft	1	Synthesizing plant	Make' sulph
108	Motor 3H.P	1				
109	Holder for carbon -dioxide gas	1				
110	Safty by water-seal	1				
111	"	1				
112	Agitator	1				
113	"	1				
114			Agitator	1	Polymerizing plant	For fo Belphe
115	Evaporator for crude C.P	1				
116			Evaporator for crude C.P	1	Sulfanilyl guanidine plant	For f Sulfan guanid
117			Rectifyer for C.P	1	"	"
118	Rectifyer for C.P	1				
119			Dryer for C.P	1	Acetone plant.	For fo Aceton
120	C.P.condenser by brine cooling	1				
121	"	1				
122			C.P.condenser by brine cooling		Sulfanilyl guanidine plant	For f Sulfan

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 4

Converted Machine - Now have been working

Name	Amount	Working plant name	Use	Condition of machine working	Remark for conver
ter shaft	1	Synthesizing plent	Make for-lime sulphar	good	At intact positio
ator	1	Polymerizing plant	For farmacy-Belphenine	good	At intact postion
erator for e O.P	1	Sulfanilyl guanidine plant	For farmacy-Sulfanilyl guanidine	good	At moving positio
ifyer for O.P	1	"	"	"	"
r for O.P	1	Acetone plant.	For farmacy-Aceton	good	At moving positio
ondenser by		Sulfanilyl guanidine plant	For farmacy-Sulfanilyl guanidine	good	At moving position

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

w have been working

Use	Condition of machine working	Remark for converting	Condition of machine	Note
			3	By enamel fall off greatly
Coke for-lime sulphar	good	At intact position	1	
			1	
			1	
			1	
			1	
			1	
t for farmacy- Belphenine	good	At intact position	1	
			2	By erosion
ine for farmacy- Sulfanilyl Guanidine	good	At moving position	1	
"	"	"	1	
			2	By erosion
for farmacy- Aceton	good	At moving position	2	
			1	
			1	
ine for farmacy- Sulfanilyl guanidine	good	At moving position	-	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Number	Closed Machine Name	Amount	Converted Machine Name	Amount	Working plant name	U
123			Receiver for pure C.P	1	Sulfanilyl guanid -ine plant	For fa Sulfan -dine
124	Receiver for pure C.P	1				
125			Receiver for low boiling materials	1	Sulfanilyl guanidine plant	For Sulf guan
126			Receiverfor lower boiling materials	1	Carbonic guanidine plant	For f Carbo
127			Get condenser	1	Sulfanilyl guanidi -ne plant	For f Sulfa
128	Vacuum pump	1				
129	Moter 10 H.P	1				
130			Vacuum tank	1	Sulfanilyl guanidi -ne plant	For sulf
131			Thermometer	1	Laboratory plant	For Sacc
132	Thermometer	1				
133	"	1				
134			Hoist	1	Sulfanilyl guanidi -ne plant	For Sulf
135			Motor 5H.P	1	"	
136			Vacuum pump	1	Carbonioguanidine plant	For Car
137			Motor 7.5H.P	1	"	
138			Test pump	1	Regenerating of catalyst plant	For ani
139			Motor 1 H.P		"	
140	Tank for balancing pressure	1				

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 4

Converted Machine - Now have been working

Name	Amount	Working plant name	Use	Condition of machine working	Remark for converti
eiver for e C.P	1	Sulfanilyl guanid -ine plant	For farmacy - Sulfanilyl guani -dine	good	At moving position
ceiver for w boiling terials	1	Sulfanilyl guanidine plant	For farmacy- Sulfanilyl guanidine	good	At moving position
ceiverfor lower iling materials	1	Carbonic guanidine plant	For farmacy - Carbonic guanidine	good	moving position
t condenser	1	Sulfanilyl guanidi -ne plant	For farmacy - Sulfanilylguanidine	good	"
cuum tank	1	Sulfanilyl guanidi -ne plant	For farmacy- sulfanilyl guanidine	good	moving position
ermometer	1	Laboratory plant	For farmacy- Saccharine	wrong	"
oist	1	Sulfanilyl guanidi -ne plant	For farmacy- Sulfanilyl guanidine	good	moving position
otor 5H.P	1	"	"	"	"
acuum pump	1	Carbonicguanidine plant	For farmacy- Carbonic guanidine	"	"
otor 7.5H.P	1	"	"	"	"
est pump	1	Regenerating of catalyst plant	For farmacy-Acet anilid	"	"
otor 1 H.P		"	"	"	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 4

Been working

nt name	Use	Condition of machine working	Remark for converting	Condition of machine	Note
guanid	For farmacy - Sulfanilyl guani -dine	good	At moving position	1	
				1	
guanidine	For farmacy- Sulfanilyl guanidine	good	At moving position	1	
nidine	For farmacy - Carbonic guanidine	good	moving position	1	
guanidi	For farmacy - Sulfanilylguanidine	good	-	1	
				2	By case breaking
				1	
guanidi	For farmacy- sulfanilyl guanidine	good	moving position	1	
plant	For farmacy- Saccharine	wrong	"	3	
					By breaking
				3	"
				3	"
l guanidi	For farmacy- Sulfanilyl guanidine	good	moving position	1	
	" "		"	1	
anidine	For farmacy- Carbonic guanidine	"	"	1	
	" "		"	1	
ing of ant	For farmacy-Acet anilid	"	"	1	
	" "		"	1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 5 Machine list of Re

Number	Closed Machine		Converted Machine - Now have			
	Name	Amount	Name	Amount	Working plant name which settled	Us
141	Ammonia compressor	1				
142	Motor 250 H.P	1				
143	Ammonia booster	1				
144	Motor 150 H.P	1				
145	Ammonia booster	1				
146	Motor 150 H.P	1				
147	Ammonia booster	1				
148	Motor 150 H.P	1				
149			Ammonia compressor	1	Refigerating plant	For f Belphen sulfo guani
150			Motor 50 H.P	1	"	
151			Oil separater	1	"	
152	Oil separator	1				
153	"	1				
154	"	1				
155	"	1				
156	Ammonia condenser	1				
157			Ammonia condenser	1	Refigerating plant	For Belphen
158	Liquid ammonia receiver	1				
159			Liquid ammonia receiver	1	Refigerating plant	For f

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.5 Machine list of Refigerating plant

Converted Machine - Now have been working

Amount	Working plant name which settled	Use	Condition of Machine working	Remark for converting
compressor 1	Refigerating plant	For farmacy-Belphenine sulfanilyl guanidine(S.G.)	good	At intact position
50 H.P 1	"	"	"	"
rator 1	"	"	"	"
condenser 1	Refigerating plant	For farmacy-Belphenine S.G.	good	At intact position
ammonia iver 1	Refigerating plant	for farmacy-	good	At intact position

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

t of Refigereting plant

ow have been working

	Use	Condition of Machine working	Remark for converting	Condition of machine	Note
				1	
				1	
				1	
				1	
				2	Take repoir (cylinder wrong)
				1	
				1	
				1	
				2	Bad insulation
nt	for farmacy-Belphenine sulfanilyl guanidine(S.G.)	good	At intact position	1	
	"	"	"	1	
	"	"	"	1	
				1	
				1	
				1	
				1	
				1	
nt	for farmacy-Belphenine S.G.	good	At intact position	1	
				1	
nt	for farmacy-	good	At intact position	1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Closed Machine			Converted Machine - Now			
Number	Name	Amount	Name	Amount	Working plant name which settled	Use
160	Accumlator	1				
161			Accumlator	1	Refigerating plant	For fa Belphe
162	Inter-cooler	1				
163	Ammonia pre-cooler	1				
164			Brine cooler	1	Refigerating plant	For fa Belphe
165	Brine pump	1	"		"	
166			Motor 7.5H.P	1	"	
167	Brine tank	1				
168	Liquid ammonia receiver	1				
169	Liquid ammonia separator	1				
170	Purge frum	1				
171			Brine tank	1	Refigerating plant	For fa Belphe
172	Brine cooler	1				
173	Ammonia condenser	1				
174	Pump	1				
175	Motor 20H.P	1				
176	Centrifuger	1				
177	Motor 1/2H.P	1				
178	Trolley block	1				
179	"	1				
180	Brine tank	1				

DECLASSIFIED E.C. 12065 SECTION 3-402/NNDG NO. 775 013

Converted Machine - Now have been working

nt	Name	Amount	Working plant name which settled	Use	Condition of machine working	Remark for con
	Accumlator	1	Refigerating plant	For farmacy-Belphenine S.G	good	At intact posit
	Brine cooler	1	Refigerating plant	For farmacy-Belphenine S.G	good	At intact posit
	"		"	"	"	"
	Motor 7.5H.P	1	"	"	"	"
	Brine tank	1	Refigerating plant	For farmacy-Belphenine S.G	good	At intact posit

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

...o.6 -

...dine - Now have been working

...ine	Use	Condition of machine working	Remark for converting	Condition of machine	Note
				1	
...nt	For farmacy-Belphenine S.G	good	At intact position	1	
				1	
				1	
...nt	For farmacy-Belphenine S.G	good	At intact position	1	
	"	"	"	1	
	"	"	"	1	
				2	By erosion
				1	
				1	
				1	
				1	
...nt	For farmacy-Belphenine S.G	good	At intact position	1	
				1	
				1	
				2	By badness fan
				1	
				2	Bad make
				1	
				1	
				1	
				2	By erosion greatly

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Closed Machine			Converted Machine - New				
Number	Name	Amount	Name	Amount	Working plant name which settle	Use	
181	Exiter	1					
182	Moter 30H.P	1					
183	Exiter	1					
184	Moter 30H.P	1					
185			Transformer	1	refigerating plant	For farm Belphening	
186			"	1	"	"	
187			Switch beard	1	"	"	
188			"	1	"	"	
189	Switch box	1					
190	"	1					
191	"	1					
192	"	1					
193	"	1					

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.5 - 3

Converted Machine - Now have been working

Noms	Amount	Working plant name which settle	Use	Condition of machine working	Remark for cont
Transformer	1	refigerating plant	For farmacy-	good	At intact positi
"	1	"	Belphenine S.C	"	
Switch board	1	"	"	"	"
"	1	"	"	"	"
			"	"	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.5 - 3

Machine - Now have been working

Name	Use	Condition of machine working	Remark for converting	Condition of machine	Note
				1	
				1	
				1	
				2	Take repair coil bad
Plant	For farmacy-Belphenine S.O	good	At intact position	1	
	"	"	"	1	
	"	"	"	1	
	"	"	"	1	
				1	
				1	
				1	
				1	
				1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.6 Machine list of Polym

Closed Machine			Converted Machine - Now have			
Number	Name	Amount	Name	Amount	Working plant Name which settled	
194	Emulsifyer(Hareru)	1				
195	"	1				
196	Moter 20 H.P	1				
197			Exhaust fan	1	Fertilizer plane No.2 "	Mal Fe
198			Moter 15 H.P	1		
199			Evaporater for polymerized C.P	1	Roll plant	Mal mat
200			"	1	"	
201			"	1	Sulfanilyl guanidine plant	Fer
202	Evaporater for polymerized C.P	1				
203	"	1				
204	"	1				
205			Evaporater for polymerized C.P	1	Sulfanilyl guanidin plant	F
206			"	1	Regenerating of catalyst plant	F
207			"	1	"	
208	Trolley block	1				

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.6 Machine list of Polymerizing plant

Converted Machine - Now have been working

nt	Name	Amount	Working plant Name which settled	Use	Condition of Machine working	Remark for
1						
1						
1						
	Exhaust fan	1	Fertilizer plans No.2	Make for - Fertilizer	good	At moving post
	Motor 15 H.P	1	"	"	"	"
	Evaporator for polymerized C.P	1	Roll plant	Make for - natural rubber	"	"
	"	1	"	"	"	"
	"	1	Sulfanilyl guanidine plant	Farmacy - S.G	"	"
1						
1						
1						
	Evaporater for polymerized C.P	1	Sulfanilyl guanidin plant	For frmacy - S.G	good	At moving po
	"	1	Regenerating of catalyst plant	For farmacy - Acetanilid	"	"
	"	1	"	"	"	"
1						

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

of Polymerizing plant

Now have been working

ame	Use	Condition of Machine working	Remark for converting	Condition of machine	Note
				1	
				1	
				1	
ne	Make for - Fertilizer	good	At moving position	2	Metal bad
		"	"	1	
	Make for - natural rubber	"	"	2	By coil breaking
	"	"	"	2	"
idine	Farmacy - S.G	"	"	1	
				1	
				1	
				1	
				1	
idin	For frmacy - S.G	good	At moving position	1	
	For farmacy - Acetanilid	"	"	1	
	"	"	"	1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.7 Machine list of Synthesizing plan

Classed Machine			Converted Machine - New have				
Number	Name	Amount	Name	Amount	Working plant Name which settled		Us
209	Hydrogen gas blower	1					
210			Moter 3 H.P	1	Synthesizing plant		For Sulfa guani
211	Silica tube	1					
212			Blower made by porcelain	1	Sulfanilyl guanidine plant		For S.G
213			Moter 1/2/H.P	1	"		
214			Air compresser	1	Synthesizing plant of Hydrochloride acid		For fo Belphe
215			Moter	1	"		
216			Oil seperater	1	"		For fo S.G
217	Safty vulve for Hydrogen	1					
218	Flow meter	1					
219	"	1					
220			Neutratising tower for exhanst gas	1	Sulfanilyl guanidine plant		For S.G
221			Sterge tank for catalyst	1	"		"
222			"	1	"		"
223	Head tank for catalyst	1					
224			Holder for chlorin	1	Synthesizing plant of Hydrochloride		Syn ruby
225	Acid proof centri-fugal pump						

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.7 Machine list of Synthesizing plant of Hydrochloride acid

Converted Machine - Now have been working

Name	Amount	Working plant Name which settled	Use	Condition of Machine working	Remark for Convert
ter	3 H.P 1	Synthesizing plant	For farmacy - Sulfanilyl guanidine(S.G)	good	At moving position
lower made by porcelain	1	Sulfanilyl guanidine plant	For farmacy - S.G	good	At moving position
ter	1/2/H.P 1	"	"	"	"
r compresser	1	Synthesizing plant of Hydrochloride acid	For farmacy - Belphenine	"	"
eter	1	"	"	"	"
il separater	1	"	For farmacy - S.G	"	"
tratizing r for exhanst gas	1	Sulfanilyl guanidine plant	For famacy- S.G	good	At moving position
rge tank for talyst	1	"	"	"	"
"	1	"	"	"	"
der for lorin	1	Synthesizing plant of Hydrochloride	Synthesizing ruby	good	At intact position

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

ing plant of Hydrochloride acid

w have been working

	Use	Condition of Machine working	Remark for Converting	Condition of machine	Note.
				2	Coil breaking
nt	For farmacy - Sulfanilyl guanidine(S.G)	good	At moving position	1	
				1	
ine	For farmacy - S.G	good	At moving position	1	
	"	"	"	1	
	"	"		1	
t	For farmacy - Belphenine	"	"	1	
	"	"	"	1	
	For farmacy - S.G	"	"	1	
				1	
				2	By inaccuracy
				3	By breaking
ine	For famacy- S.G	good	At moving position	1	
	"	"	"	3	By cleft
	"	"	"	3	"
				3	"
of	Synthesizing ruby	good	At intact position	2	By inside lead take off
				3	By erosion

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Converted Machine - Now E

Closed Machine

Number	Name	Amount	Name	Amount	Working plant No which settled
226	Motor 3 H.P	1			
227	Silica tube	1			

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Converted Machine - Now have been working

ount	Name	Amount	Working plant Name which settled	Use	Condition of Machine working	Re oc
1						
1						

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

2

- Now have been working

Plant Name settled	Use	Condition of Machine working	Remark for converting	Condition of machine	Note
				1	
				1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 8 Machine list of Secon

Classed Machine			Converted Machine - Now have			
Number	Name	Amount	Name	Amount	Working plant name which settled
228	Pump	1			
229	Motor 20 H.P	1			

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.8 Machine list of second pump room

Converted Machine - Now have been working

Amount	Name	Amount	Working plant name which settled	Use	Condition of Machine working	E
1						
1						

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

t of second pump room

- Now have been working

plant name settled	Use	Condition of Machine working	Remark for converting	Condition of machine	Note
				1	
				1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.9 Machine list of elect

Closed Machine			Converted Machine - New ha		
Number	Name	Amount	Name	Amount	Working plant which settled
230			Electroysis vessel	1	Electroysis o water plant
231			"	1	"
232			"	1	"
233			"	1	"
234			"	1	"
235			Converter	1	"
236			Meter 5 H.P	1	"
237			Transformer	1	"
238			"	1	"
239			"	1	"
240			Switch beard	1	"
241			Washer for exygen	1	"
242			Washer for Hydrogen	1	"
243			Hydrogen holder	1	"
244	Equipment to getting distilled water evapolator	1			
245	" Condenser	1			
246	Tank for distilled water	1			

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.9 Machine list of electroysis of water

Converted Machine - Now have been working

Name	Amount	Working plant Name which settled	Use	Condition of machine working	Rem Con
Electroysis vessel	1	Electroysis of water plant	For farmacy-Alcohol	good	At inte
"	1	"	"	"	"
"	1	"	"	"	"
"	1	"	"	"	"
"	1	"	"	"	"
Converter	1	"	"	"	"
Moter 5 H.P	1	"	"	"	"
Transformer	1	"	"	"	"
"	1	"	"	"	"
"	1	"	"	"	"
Switch board	1	"	"	"	"
Washer for exygen	1	"	"	"	"
Washer for Hydrogen	1	"	"	"	"
Hydrogen holder	1	"	"	"	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

ist of electroysis of water

ine - Now have been working

rking plant Name hich settled	Use	Condition of machine working	Remark for Converting	Condition of machine	note
lectroysis of ater plant	For farmacy-Alcohol	good	At intact position	1	
"	"	"	"	1	
"	"	"	"	1	
"	"	"	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.10 Machine list of Regen

Classed Machine			Converted Machine - Now b		
Number	Name	Amount	Name	Amount	Working plant Name which settled
247			Alkali tank	1	Fertilizer plant No.2
248			Centrifugar 24'	1	Regenerating plant of V Catalyst
249			" "	1	Salt plant
250			" 30'	1	Regenerating plant of Catalyst
251			Meter 3 H.P	1	"
252			" "	1	Salt plant
253			" 7.5 H.P	1	Regenerating plant of Catalyst
254	Turbine pump	1			
255	"	1			
256			Agitator	1	Accelarator plant
257			"	1	"
258			"	1	Sulfanilyl guanidine plant
259			"	1	"
260			"	1	"
261			"	1	"
262			"	1	"
263			"	1	"
264			Air tank	1	"
265			Centrifugal pump	1	Carbonic guanidine plant
266			Meter 2H.P	1	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.10 Machine list of Regenerating plant of Catalyst

Converted Machine - Now have been working

Name		Amount	Working plant Name which settled	Use	Condition of machine working	Rem Con
Alkali tank		1	Fertilizer plant No.2	Make for-Fertilizer	good	At mo
Centrifugar	24'	1	Regenerating plant of y Catalyst	Farmacy-Acetanilid	"	At in
"	"	1	Salt plant	Make for-Salt	"	At mo
"	30'	1	Regenerating plant of Catalyst	Farmacy-Acetanilid	"	At in
Motor	3 H.P	1	"	"	"	
"	"	1	Salt plant	Make for-Salt	"	At mo
"	7.5 H.P	1	Regenerating plant of Catalyst	Farmacy-Acetanilid	"	At in
1						
1						
Agitator		1	Accelarator plant	Make for-rubber accelarator	good	At mo
"		1	"	"	"	
"		1	Sulfanilyl guanidine plant	Farmacy-Sulfanilyl guanidine	"	
"		1	"	"	"	
"		1	"	"	"	
"		1	"	"	"	
"		1	"	"	"	
"		1	"	"	"	
"		1	"	"	"	
Air tank		1	"	"	"	
Centrifugal pump		1	Carbonic guanidine plant	Farmacy-Carbonic guanidine	"	
Motor	3H.P	1	"	"	"	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

f Regenerating plant of Catalyst

- Now have been working

nt Name ed	Use	Condition of machine working	Remark for Converting	Condition of machine	Note
ant No.2	Make for-Fertilizer	good	At moving position	1	
plant of	Farmacy-Acetanilid	"	At intact position	1	
	Make for-Salt	"	At moving position	1	
plant of	Farmacy-Acetanilid	"	At intact position	1	
	"	"	"	1	
	Make for-Salt	"	At moving position	1	
plant of	Farmacy-Acetanilid	"	At intact position	1	
				1	
				1	
plant	Make for-rubber accelarator	good	At moving position	1	
	"	"	"	1	
uanidine	Farmacy-Sulfanilyl guanidine	"	"	1	
	"	"	"	1	
	"	"	"	1	
	"	"	"	1	
	"	"	"	2	Cover breaking
	"	"	"	2	"
	"	"	"	1	
anidine	Farmacy-Carbeni guanidine	"	"	1	
	"	"	"	1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Closed Machine			Converted Machine - Now ha		
Number	Name	Amount	Name	Amount	Working plant N which settled
267	Filter press	1			
268	"	1			
269	"	1			
270	Boiler	1			

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Converted Machine - How have been working

ount	Name	Amount	Working plant Name which settled	Use	Condition of Machine working	R- C
1						
1						
1						
1						

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

- Now have been working

plant Name settled	Use	Condition of Machine working	Remark for Converting	Condition of Machine	Note
				1	
				1	
				1	
				2	By inside cylinder breaking

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.11 Machine list of Roll

Classed Machine			Converted Machine - Now have be		
Number	Name	Amount	Name	Amount	Working plant Name which settled
271			Mixing roll	1	Roll machine plant
272			"	1	"
273			Reducer	1	"
274			Counter shaft	1	"
275			Meter 100 H.P	1	"
276			Switch board	1	"
277			Mixing roll	1	"
278			Meter 5 H.P	1	"
279			Reducer	1	"
280			Press Vulcanization	1	"
281			Exhaust fan	1	Sulphanilyl guani
282			Meter 10 H.P		"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.11 Machine list of Roll machine

Converted Machine - Now have been working

Name	Amount	Working plant Name which settled	Use	Condition of machine working	Remark Conver
Mixing roll	1	Roll machine plant	Product for - natural rubber	good	At int positi
"	1	"	"	"	"
Reducer	1	"	"	"	"
Counter shaft	1	"	"	"	"
Moter 100 H.P	1	"	"	"	"
Switch board	1	"	"	"	"
Mixing roll	1	"	"	"	"
Moter 5 H.P	1	"	"	"	"
Reducer	1	"	"	"	"
Press Vulcanization	1	"	"	"	"
Exhaust fan	1	Sulphanilyl guanidine	Farmacy - Sulphanilyl guanidine	"	At movin tion
Moter 10 H.P		"	"	"	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

st of Roll machine

w have been working

plant Name settled	Use	Condition of machine working	Remark for Converting	Condition of machine	note
hine plant	Product for - natural rubber	good	At intact position	1	
"	"	"	"	1	
"	"	"	"	1	
"	"	"	"	1	
"	"	"	"	1	
"	"	"	"	1	
"	"	"	"	1	
"	"	"	"	1	
"	"	"	"	1	
"	"	"	"	1	
"	"	"	"	3	By breaking
nilyl guanidine	Farmacy - Sulphanilyl guanidine	"	At moving position	1	
"	"	"	"	1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.12 Machine list

Closed Machine			Converted Machine - Now hav		
Number	Name	Amount	Name	Amount	Working plant which settled Nam
283			Boiler	1	Boiler chanber
284			"	1	"
285			Feed tank	1	"
286			"	1	"
287	Kettle	1			
288	"	1			
289			Washington pump	1	Boiler chanber
290		"		1	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.12 Machine list of Boiler

Converted Machine - Now have been working

nt Name	Amount	Working plant Name which settled	Use	Condition of machine working	Rema Conv
Boiler	1	Boiler chanber	Farmacy-Belphenine Acetanilid S.G. Rubber	good	At intac
"	1	"	"	"	"
Feed tank	1	"	"	"	"
"	1	"	"	"	"
Washington pump	1	Boiler chanber	Farmacy-Belphenine Acetaniled S.G. Rubber.	good	At intact
"	1	"	"	"	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

achine list of Boiler

ine - Now have been working

ing plant Name h settled	Use	Condition of machine working	Remark for Converting	Condition of machine	Note
chanber	Farmacy-Belphenine Acetanilid S.C. Rubber	good	At intact position	1	
"	"	"	"	1	
"	"	"	"	1	
"	"	"	"	1	
				1	
				3	By breaking
chanber	Farmacy-Belphenine Acetaniled S.C. Rubber.	good	At intact position	1	
"	"	"	"	1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.13 Machine list of Tec

Closed Machine			Converted Machine - Now have		
Number	Name	Amount	Name	Amount	Working plant No. which settled
291			Testing machine for tensile strength	1	Laboratory
292			Testing machine for Ageing	1	Testing room
293			Meter 1/2 H.P	1	"
294			Cutter test piece	1	Laboratory
295			Thermostat by air	1	Testing room
296	Thermostat by air	1			
297			Thermostat by air	1	Testing room
298	Emulsifyer(Hareru)	1			
299			Meter 2 H.P	1	Hizenaphol plant
300			Vaccum pump	1	Laboratory
301			Meter 1/4 H.P	1	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.13 Machine list of Tester room

Converted Machine - Now have been working

Int	Name	Amount	Working plant which settled	Name Use	Condition of machine working	Rem Con
	Testing machine for tensile strength	1	Laberatory	Make for-Natural rubber	good	At movi
	Testing machine for Ageing	1	Testing room	"	"	At inta
	Moter 1/2 H.P	1	"	"	"	"
	Cutter test piece	1	Laberatory	"	"	At movi
	Thermostat by air	1	Testing room	Farmacy-Belphenine	"	At intu
	Thermostat by air	1	Testing room	Farmacy-Acetanilid	good	At movi
	Moter 2 H.P	1	Hizenaphol plant	Formacy-Hizenaphol	good	At movi
	Vaccum pump	1	Laberatory	Laberatory	"	"
	Moter 1/4 H.P	1	"	"		

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

list of Tester room

- Now have been working

ng plant settled	Name	Use	Condition of machine working	Remark for Converting	Condition of machine	Note
ratory		Make for-Natural rubber	good	At moving position	1	
ing room		"	"	At intact position	2	By regulator breaking
"		"	"	"	1	
ratory		"	"	At moving position	1	
ing room	. Farmacy-Belphenine		"	At intact position	1	
					1	
ing room	Farmacy-Acetanilid		good	At moving position	1	
					1	
naphol plant	Formacy-Hizenaphol		good	At moving position	1	
ratory	Leboratory		"	"	1	
"	"				1	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

MACHINE LIST OF SYNTHETIC RUBBER PLANT

1946. Nov. Investigate

Uozu works. Nippon Carbide Industriel Co.Ltd

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

These machines are made in Japan.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.1 Machine list of Acetylen Manufactore

Number	Name	Amount	
1	Brake Crusher	1	The Sato Machine manufactory
2	Motor 15HP	1	The Tokyo plant Shibaura Co.,Ltd.
3	Basket conveyer	1	The Nippon Carbide Industrial Co.
4	Roll Crusher	1	The Sato Machine manufactory
5	Motor 25HP	1	The Tokyo Plant Shibanra Co.,Ltd.
6	Winch	1	
7	Motor 15 HP	1	The Hitachi Co.,Ltd.
8	Hand - winch	1	
9	Trolley block	1	The Miura Machine store
10	Acetylene generator	1	The Sato Machine industrial Co.,L
11	Motor 5HP	1	"
12	Acetylene generator	1	"
13	Motor 5HP	1	"
14	Pump	1	The Shindo pump Manufactory
15	Motor 2HP	1	The Mitsubishi electric machine
16	Pump	1	The Shindo pump maunfactory
17	Motor 2HP	1	The Mitshbishi electric machine
18	Head tank	1	The Sumitomo machine industrial
19	"	1	"
20	Acetylene holder	1	The Toyo carry air Co.,Ltd.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.1 Machine list of Acetylene Generating Plant

ount	Manufactore	Manufactores model number
1	The Sato Machine manufactory	Double floor type SRT/H 185mmx6mm
1	The Tokyo plant Shibaura Co.,Ltd.	Open type 15HP
1	The Nippon Carbide Industrial Co.,Ltd.	Self taught type 5x9,length 3,950
1	The Sato Machine manufactory	Double flower type SRT/H 185mm x 6mm
1	The Tokyo Plant Shibanra Co.,Ltd.	Open type 15 HP
1		
1	The Hitachi Co.,Ltd.	Open type 15 HP
1		By hand type
1	The Miura Machine store	Triple geared type 3 K.T
1	The Sato Machine industrial Co.,Ltd.	Self taught type 120 - 125 m^3/H
1	"	Enclosed type endure explosion type
1	"	Self taught type 120 - 125 m^3/H
1	"	Enclosed type endure explosion type
1	The Shindo pump Manufactory	Spiral type
1	The Mitsubishi electric machine Co.,Ltd.	Open type 3H.P
1	The Shindo pump maunfactory	Spiral type
1	The Mitshbishi electric machine Co.,Ltd.	Open type 3H.P
1	The Sumitomo machine industrial Co.,Ltd.	Box type
1	"	"
1	The Toyo carry air Co.,Ltd.	Wet type 400 m^3

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Acetylene Generating Plant

	Manufactorers model number	Age of machine in years
tory	Double floor type 5ET/H 125mmx6mm	1942
Co.,Ltd.	Open type 15HP	1942
trial Co.,Ltd.	Self taught type 5x9,length 3,950	1942
tory	Double flower type 5KJ/H 125mm x 6mm	1942
Co.,Ltd.	Open type 25 HP	1937
	Open type 15 HP	1939
	By hand type	1939
	Triple geared type 9 K.T	1939
rial Co.,Ltd.	Self taught type 120 - 125 m^3/H	1942
	Enclosed type endure explosion type 5HP	1939
	Self taught type 120 - 125 m^3/H	1942
	Enclosed type endure explosion type 5HP	1939
tory	Spiral type	1942
machine Co.,Ltd.	Open type 2H.P	1942
tory	Spiral type	1942
machine Co.,Ltd.	Open type 2H.P	1942
dustrial Co.,Ltd.	Box type	1942
	"	1942
Ltd.	Wet type 300 m^3	1943

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.2 Machine list of

Number	Name	Ammount	Manufactore
21	Purifyer	1	The Toyo carryair Co., Ltd.
22	"	1	"
23	"	1	"
24	Safty by water - seale	1	The Nippon carbide industrial Co.

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.2 Machine list of Acetylene purifyer

Ammount	Manufactore	Manufactores model Numbe
1	The Toyo carryair Co., Ltd.	Vertical cylinder type 200
1	"	"
1	"	"
1	The Nippon carbide industrial Co. Ltd.	Self taught type

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

hine list of Acetylene perifyer

re	Manufactores model Number	Age of machine in years
. Ltd.	Verticol cylinder type 200 m^3/H	1943
	"	1943
	"	1943
dustrial Co. Ltd.	Self taught type	1943

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Number	Name	Amount	Manufactore
25	Pump	1	The Ebara Co.,Ltd
26	"	1	"
27	Moter 30 HP	1	The Meidensha Co.,Ltd.
28	" 20 HP	1	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.3 Machine list of first pump Room

Amount	Manufactore	Manufactores model Number
1	The Ebara Co.,Ltd	Spiral type 175 mm
1	"	"
1	The Meidensha Co.,Ltd.	Open type 20 H.P.
1	"	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

achine list of First pump Room

	Manufactores model Number	Age of machine in years
	Spiral type 175 mm	1943
	"	1943
Ltd.	Open type 20 H.P.	
	"	1943

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.4 Machine list of Synthesis

Number	Name	Amount	Manufacture
29	Gas meter	1	The Hirosawa meter manufactory
30	Acetylene blower	1	The Asakura manufactory
31	Motor	1	The Sibaura Co. Ltd
32	Accumlator	1	The Shimazu Co. Ltd
33	"	1	"
34	Pre-heater for Acetylene	1	The Sato industrial Co.Ltd
35	Tank	1	"
36	Pump	1	The Ebara Co. Ltd
37	Motor	1	The Shivaura Co. Ltd
38	Flow meter	1	The Hirosawa motor manufactory
39	Orifice flow meter	1	The Hokushin electric machine Co.Ltd
40	"	1	"
41	"	1	"
42	"	1	"
43	"	1	"
44	"	1	"
45	"	1	"
46	"	1	"
47	First catalyst holder with water jacket	1	The ohuo wood tank & pipe Co.Ltd
48	"	1	The Yashima ceramic Co.Ltd
49	Reaction vessel No.1 with water-jachet	1	The Toyo carry air Co.Ltd
50	"	1	"
51	"	1	"
52	"	1	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No.4 Machine list of Synthesizing plant

Amount	Manufacture	Manufacturese model number
1	The Hirosawa meter manufactory	Record indicate type round type
1	The Asakura manufactory	Tabo type 1000 m^3/H
1	The Sibaura Co. Ltd	Open type
1	The Shimazu Co. Ltd	Vertical cylinder type
1	"	"
1	The Sato industrial Co.Ltd	Vertical cylinder type
1	"	Spiral tube type
1	The Ebara Co. Ltd	Eddy type
1	The Shivaura Co. Ltd	Double open type 2H.P
1	The Hirosawa meter manufactory	
1	The Hokushin electric machine Co.Ltd	Record indicate type round type
1	"	"
1	"	"
1	"	"
1	"	"
1	"	"
1	"	"
1	The chuo wood tank & pipe Co.Ltd	Woodtank 1500 x 1300 x 1400
1	The Yashima ceramic Co.Ltd	Acid proof made by porcelein
1	The Toyo carry air Co.Ltd	Vertical cylinder type 843 x 1500
1	"	"
1	"	"
1	"	"

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

f Synthesizing plant

	Manufacturese model number	Age of machine in year's
actory	Record indicate type round type	1943
	Tabo type 1000 m^3/H	1943
	Open type	1943
	Vertical cylinder type	1943
	"	1943
td	Vertical cylinder type	1943
	Spiral tube type	1943
	Eddy type	1943
	Double open type 2H.P	1943
actory		1943
chine Co.Ltd	Record indicate type round type	1943
	"	1943
	"	1943
	"	1943
	"	1943
	"	1943
	"	1943
	"	1943
ne Co.Ltd	Woodtank 1500 x 1300 x 1400	1943
Ltd	Acid proof made by porcelein	1943
d	Vertical cylinder type 843 x 1500	1943
	"	1943
	"	1943
	"	----

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Number	Name	Amount	Manufacture
53	Reaction vessel No.1 with water-jachet	1	The Toyo carry air Co.Ltd
54	"	1	"
55	"	1	"
56	"	1	"
57	"	1	"
58	"	1	"
59	Pump	1	The Ebara Co.Ltd
60	"	1	"
61	"	1	"
62	"	1	"
63	"	1	"
64	Motor	1	The Shibaura electric industrial Co.Ltd
65	"	1	"
66	"	1	"
67	"	1	"
68	"	1	"
69	Spare reaction vessel No.1	1	The Yashima ceramic Co.Ltd.
70	Caunter shaft	1	
71	Motor 7.5 H.P	1	The Shibaura electric industrial Co.Ltd
72	Alkali washing tower	1	The Sato factory
73	Tank	1	
74	Pump	1	The Ebara Co.Ltd
75	motor	1	The Shibaura electric industrial Co.Ltd
76	Water cooling condenser No.1	1	The Toyo carry air Co.Ltd

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Amount	Manufacture	Manufacturese model number
1	The Toyo carry air Co.Ltd	Vertical Cylinder type 843 x 1600
1	"	"
1	"	"
1	"	"
1	"	"
1	"	"
1	The Ebara Co.Ltd	Eddy type
1	"	"
1	"	"
1	"	"
1	"	"
1	The Shibaura electric industrial Co.Ltd	Enclosed type 2 H.P
1	"	"
1	"	"
1	"	"
1	"	"
1	"	"
No.1 1	The Yashima ceramic Co.Ltd.	Cylinder type 750 x 1600
1		
1	The Shibaura electric industrial Co.Ltd	Enclosed type 7.5 H.P
1	The Sato factory	Vertical cylinder type
1	"	Cylinder type
1	The Ebara Co.Ltd	Eddy type
1	The Shibaura electric industrial Co.Ltd	Double open type 2 H.P
No.1 1	The Toyo carry air Co.Ltd	Refrigenerate by water type 1024 x 4

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

	Manufacturese model number	Age of machine in year's
d	Vertical Cylinder type 843 x 1500	1943
	"	1943
	"	1943
	"	1943
	"	1943
	"	1943
	Eddy type	1943
	"	1943
	"	1943
	"	1943
	"	1943
	"	1943
ndustrial	Enclosed type 2 H.P	1943
	"	1943
	"	1943
	"	1943
	"	1943
	"	1943
Ltd.	Cylinder type 750 x 1600	1943
		1943
ndustrial	Enclosed type 7.5 H.P	
	Vertical cylinder type	1943
	Cylinder type	1943
	Eddy type	1943
ndustrial	Double open type 2 H.P	1943
Ltd	Refrigenerate by water type 1024 x 4550	1943

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Number	Name	Amount	Manufacture
77	Water cooling condenser No.2	1	The Toyo carry air Co.Ltd.
78	Heat exchanger No.3	1	"
79	Brine washing tower	1	The Sato factory
80	Tank	1	"
81	"	1	"
82	Pump	1	The Ebara Co.Ltd.
83	"	1	"
84	Motor 3 H.P	1	The Meidensha Co.Ltd
85	" 3 H.P	1	"
86	Brine cooling condenser No.4	1	The Toyo carry air Co.Ltd
87	"	1	"
88	Dryer for Acetylene by solid calcium chloride	1	The Nippon fuel chemical machine Co.Ltd
89	"	1	"
90	Ammonia cooling condenser No.5	1	The Toyo carry air Co.Ltd
91	"	1	"
92	"	1	"
93	Receiver for crude monovinyl Acetylene	1	"
94	Receiver(Earthenware Pot)	1	The Toyo carry air Co.Ltd
95	Evaporator for M.V.A	1	"
96	"	1	"
97	Rectifyer for M.V.A	1	"
98	Dryer for pure M.V.A	1	The Nippon fuel chenical machine Co.Ltd

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Amount	Manufacture	Manufacturese model number	Age
1	The Toyo carry air Co.Ltd.	Refrigenerate by water type 1024 x 4550	
1	"	Vertical maltitube type 1072 x 1000	
1	The Sato factory	Wet type 1200 x 1000	
1	"	Spiral type	
1	"	"	
1	The Ebara Co.Ltd.	Eddy type	
1	"	"	
1	The Meidensha Co.Ltd	All enclosed type 3 H.P .	
1	"	"	
4 1	The Toyo carry air Co.Ltd	Brine type 1672 x 4800	
1	"	"	
1	The Nippon fuel chemical machine Co.Ltd	Dry type	
1	"	"	
.8 1	The Toyo carry air Co.Ltd	Ammonia type 1112 x 4150	
1	"	"	
1	"	"	
1	"	Vestical multi tube type 1500 x 1810	
1	The Toyo carry air Co.Ltd	Made by earthenware	
1	"	" 1300 x 1700	
1	"	" "	
1	"	Vertical multi tube type 294 x 2550	
1	The Nippon fuel chenical machine Co.Ltd	Vertical cylinder type $CaCl_2$ plus	

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

- 3

	Manufacturese model number	Age of machine ir years
ltd.	Refrigenerate by water type 1024 x 4550	1943
	Vertical maltitube type 1072 x 1000	1943
	Wet type 1200 x 1000	1943
	Spiral type	1943
	"	1943
	Eddy type	1943
	"	1943
	All enclosed type 3 H.P .	1943
	"	1943
Ltd	Brine type 1672 x 4800	1943
	"	1943
l machine	Dry type	
	"	
Ltd	Ammonia type 1112 x 4150	1943
	"	
	"	
	Vestical multi tube type 1500 x 1850	
Ltd	Made by earthenware	1943
	" 1300 x 1700	1943
	" "	1943
	Vertical multi tube type 294 x 2550	1943
l machine	Vertical cylinder type $CaCl_2$ plus	1943

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Number	Name	Amount	Manufacture
99	M.V.A Condenser by brine cooling	1	The Toyo carry air Co.Ltd
100	Receiver for pure M.V.A	1	"
101	"	1	"
102	Reaction vessel No.2	1	The Toho chemical industrial Co.Ltd
103	"	1	"
104	"	1	"
105	"	1	"
106	"	1	"
107	Counter shaft	1	The Toyo carry air Co.Ltd
108	Moter	1	The Shibaura electric machine Co.Ltd
109	Holder for carbon-dioxide gas	1	The Sumitomo chemical industrial
110	Safty by water seal	1	The Nippon carbide industrial Co
111	"	1	"
112	Agitator	1	The Sato Science industrial Co.L
113	"	1	"
114	"	1	"
115	Evaporator for crude C.P	1	The Toyo carry air Co.Ltd
116	"	1	"
117	Rectifyer for C.P	1	"
118	"	1	"
119	Dryer for C.P	1	The Nippon fuel chemical machine

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Amount	Manufacture	Manufacturese model number
1	The Toyo carry air Co.Ltd	Brine type 450 x 2420
1	"	Double tube type 1200 x 1800
1	"	"
1	The Toho chemical industrial Co.Ltd	Double can type 1400 x 1750
1	"	"
1	"	"
1	"	"
1	"	"
1	The Toyo carry air Co.Ltd	
1	The Shibaura electric machine Co.Ltd	Open type 3H.P
1	The Sumitomo chemical industrial Co.Ltd	
1	The Nippon carbide industrial Co.Ltd	Vertical cylinder
1	"	"
1	The Sato Science industrial Co.Ltd	
1	"	
1	"	
1	The Toyo carry air Co.Ltd	Vertical muli tube type 1100 x 1900
1	"	"
1	"	Vertical Cylinder type 294 x 3250
1	"	"
1	The Nippon fuel chemical machine Co.Ltd	Vertical Cylinder type $CaCl_2$ plug

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

	Manufacturese model number	Age of machine in years
Ltd	Brine type 450 x 2420	1943
	Double tube type 1200 x 1800	1943
	"	1943
trial	Double can type 1400 x 1750	1943
	"	1943
	"	1943
	"	1943
	"	1943
.Ltd		
achine	Open type 3H.P	1943
industrial	Co.Ltd	
ustrial	Co.Ltd Vertical cylinder	1943
	"	
trial	Co.Ltd	1943
.Ltd	Vertical muli tube type 1100 x 1900	1943
	"	1943
	Vertical Cylinder type 294 x 336	1943
	"	1943
al machine	Vertical Cylinder type $CaCl_2$ plug	1943

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

Number	Name	Amount	Manufacture
120	C.P. Condenser by brine cooling	1	The Toyo carry air Co.Ltd
121	"	1	"
122	"	1	"
123	Receiver for pure C.P	1	"
124	"	1	"
125	Receiver for low boiling materials	1	The Sate factory
126	"	1	"
127	Get condenser	1	"
128	Vacuum pump	1	The Wnosawa Company iron factor
129	Motor 10 H.P	1	The Shibaura electric industri Co.Ltd
130	Vacuum tank	1	The Toyo carry air Co.Ltd
131	Thermometer	1	The Hokushin electric machine Co.Ltd
132	"	1	"
133	"	1	"
134	Hoist	1	The Mikuni hoist factory
135	Motor 5H.P	1	The Yasukawa electric machine Co.Ltd
136	Vacuum pump	1	The Nishikawa factory
137	Motor 7.5 H.P	1	The Fuji electric industrial C
138	Test pump	1	
139	Motor 1 H.P	1	The Yasukawa electric machine Co.Ltd
140	Tank for balancing pressure	1	The Toyo carry air Co.Ltd

DECLASSIFIED E.O. 12065 SECTION 3-402/NNDG NO. 775 013

No. 4 - 5

Amount	Manufacture	Manufacturese model number
1	The Toyo carry air Co.Ltd	Brine type 450 x 2420
1	"	"
1	"	"
1	"	Double can type 1200 x 1500
1	"	"
1	The Sate factory	Spiral type
1	"	"
1	"	"
1	The Unosawa Company iron factory	Unosawa type S.V.Y type
1	The Shibaura electric industrial	Double open type 10 H.P
1	The Shibaura electric industrial Co.Ltd	Double open type 10 H.P
1	The Toyo carry air Co.Ltd	Vertical Cylinder type 300 x 1500
1	The Eokushin electric machine Co.Ltd	Box type Electric resistance type
1	"	"
1	"	"
1	The Mikuni hoist factory	Mikuni type SKT
1	The Yasukawa electric machine Co.Ltd	All enclosed type
1	The Nishikawa factory	Vertical two cylinder 4 x 4 inch
1	The Fuji electric industrial Co.Ltd	Reef enclosed type
1		
1	The Yasukawa electric machine Co.Ltd	Enclosed typ
1	The Toyo carry air Co.Ltd	Box type

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essure