

# Report on Refrigerating Machinery and Appliances.

2 NOV 1955

Received at London Office

Date of writing Report 19... When handed in at Local Office <sup>OCT. 27 1955</sup> 19... Port of **Kobe**

No. in Reg. Book. Survey held at **Tamano, Japan** Date: First Survey **21-1-1955** Last Survey **23-7-** 19**55**.  
(Number of Visits **21**)

on the Refrigerating Machinery and Appliances of the **M.V. "HODAKASAN MARU"** Tons <sup>Gross</sup> **7218.16**  
<sup>Net</sup> **4028.36**

Vessel built at **Tamano, Japan** By whom built **Mitsui S.B. & Eng., Co., Ltd.** Yard No. **593** When built **July, 1955**.

Owners **Mitsui Sempaku K.K.** Port belonging to **Tokyo** Voyage **Ocean going**.  
**F-200-Sabroe Co., of Japan Ltd.** (F-200) 20022-20025

Refrigerating Machinery made by **RL20-Mitsui S.B. & E. Co. Ltd.** Machine No. **(RL20) 6, 7** When made **July, 1955**.

Insulation fitted by **Mitsui S.B. & E. Co. Ltd.** When fitted **July, 1955** System of Refrigeration **Freon 12 direct expansion**.

Method of cooling Cargo Chambers **forced air circulation pass through plain pipe air cooler** Insulating Material used **Slab Cork**

Number of Cargo Chambers insulated **5** Total refrigerated cargo capacity **14800 (net)** cubic feet

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed **Port side, 2nd deck of engine room.**

Refrigerating Units, No. of **5** No. of machines **6 (4 x F-200) (2 x RL-20)** Is each machine independent **Yes**

Total refrigeration or ice-melting capacity in tons per 24 hours **4 x 5.23 (2 x 2.8)** Are all the units connected to all the refrigerated chambers **Yes**

Compressors, driven direct ~~or~~ through ~~xxx~~ **RL20 compressor & F200 compressor** Compressors, single or double acting **F-200 single** If multiple effect compression **No**

Are relief valves or safety discs fitted **Yes** No. of cylinders to each unit **RL20=1** Diameter of cylinders **RL20=100mm**

Diameter of ~~xxxxxx~~ **F200=32mm** Length of stroke **RL20=Rotary type** No. of revolutions per minute **RL20=1210-840**

Motive Power supplied from **3 electric generators** (State number of boilers, oil engines or electric generators supplying the motive power.)

Steam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders **-** Diameter **-**

Length of stroke **-** Working pressure **-** Diameter of crank shaft journals and pins **-**

Breadth and thickness of crank webs **-** No. of sections in crank shaft **-** Revolutions of engines per minute **-**

Oil Engines, type **-** 2 or 4 stroke cycle **-** Single or double acting **-** B.H.P. **-**

No. of cylinders **-** Diameter **-** Length of stroke **-** Span of bearings as per Rule **-**

Maximum pressure in cylinders **-** Diameter of crank shaft journals and pins **-**

Breadth and thickness of crank webs **-** No. of sections in crank shaft **-** Revolutions of engine per minute **-**

Air Receivers:—Have they been made under survey **-** State No. of Report or Certificate **-**

Is each receiver, which can be isolated, fitted with a safety valve as per Rule **-**

Can the internal surfaces of the receivers be examined and cleaned **-** Is a drain fitted at the lowest part of each receiver **-**

No. of Receivers **-** Cubic capacity of each **-** Internal diameter **-** thickness **-**

Seamless, lap welded or riveted longitudinal joint **-** Material **-** Range of tensile strength **-** Working pressure by Rules **-**

Electric Motors, type **Drip proof, self-ventilation** No. of **6** Rate **11-7.65** Kilowatts **220** Volts

at **1800-1200, 1210-840** revolutions per minute. Diameter of motor shafts at bearings **60.50mm**

Reduction Gearing **-** Pitch circle diameter, pinion **-** Main wheel **-** Width of face **-**

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, pinion **-** Main wheel **-**

Pinion shafts, diameter at bearings **-** Main wheel shaft, diameter at bearings **-**

Gas Condensers, No. of **6** Cast iron or steel casings **Steel** Cylindrical or rectangular **Cylindrical** Are safety valves fitted

to casings **Yes** No. of ~~xxx~~ **tubes** **96, 66** Material of coils **Copper** Can each ~~xxx~~ be readily shut off or disconnected **No**

Water Circulating Pumps, No. and size of pumps available **2x26M3/hx 16m** how worked **Direct coupled** Gas Separators, No. of **6**

Gas Evaporators, No. of **-** Cast iron or steel casings **-** Pressure or gravity type **-** If pressure type, are safety

valves fitted **-** No. of coils in each casing **-** Material of coils **-** Can each coil be readily shut off or disconnected **-**

Direct Expansion ~~or~~ **Batteries**, No. of **5** Are there two separate systems, so that one may be in use while the other is being

cleared of snow **No** No. of coils in each battery **4, 3, 2** Material of coils **Steel** Can each coil be readily shut off or

disconnected **Yes** Total cooling surface of battery coils **810,609,444 sq. ft.** Is a watertight tray fitted under each battery **Yes**

Air Circulating Fans, Total No. of **5** each of **6000, 2470, 3530** cubic feet capacity, at **1800, 2500, 2000** revolutions per minute

Steam or electrically driven **Electrically** Where spare fans are supplied are these fitted in position ready for coupling up **Yes**

Brine Circulating Pumps, No. and size of, including the additional pump **-** how worked **-**

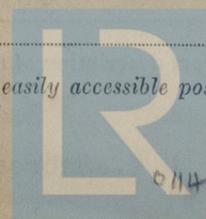
Brine Cooling System, closed or open **-** Are the pipes and tanks galvanised on the inside **-**

No. of brine sections in each chamber **-**

Can each section be readily shut off or disconnected **-** Are the control valves situated in an easily accessible position **-**

NOTE.—THE WORDS WHICH DO NOT APPLY SHOULD BE DELETED.

20.12.17. (MADE AND PRINTED IN ENGLAND.)



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Lloyd's Register Foundation

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DESCRIPTION OF INSULATION.

	IN LOWER HOLD CHAMBERS.					IN 'TWEEN DECK CHAMBERS.				
	Air Space.	Outer Lining.	Non-conducting Material.	Thickness of ditto.	Inner Lining.	Air Space.	Outer Lining.	Non-conducting Material.	Thickness of ditto.	Inner Lining.
Frame No. 130 (A) (Fore Peak)						35mm	1-16mm Soft wood cork board	225mm	16+25mm	Soft wood
P. side only							2-layer paper			2 layer paper
Frame No. 122 (M)							25+16mm Soft wood cork board	150mm	25+16mm	Soft wood
							2-layer paper			2 layer papers
Frame No. 130 (F)						35mm	1-16mm Soft wood cork board	150mm		"
P. side only (A)							2-layer papers			
Frame No. 111 (F)							25+16mm Soft wood cork board	150mm		"
(A)							2-layer papers			
Frame No. 109 (Boiler Room) (F)						35mm	1-16mm Soft wood	"	"	"
(A)							2-layer papers			
Frame No. (Engine Room) (F)							25+16mm Soft wood	"	"	"
(A)										
Frame No. (Between cooler RM) (F)						35mm	1-16mm Soft wood	100mm		"
(A)							2-layer papers			
Frame No. 94 (F)						35mm	(Side (Shell side only) glass wool & cork)			"
(A)						85mm	Cooler RM (Overhead (Floor) cork board)			"
Frame No. (After Peak) (F)						30mm	(Shell side only) glass wool & cork			"
Sides						35mm	glass wool & cork cork board	225mm	25+16mm	Soft wood
Overheading						35mm	cork board	"	"	2-layer papers
Floors of Chambers						30mm	"	"	"	"
Trunk Hatchways							* (1-16mm Soft wood			
Thrust Recess, Sides and Top							(10mm Asphalt pitch			
Tunnel Sides and Top							(50mm Deck composition			
Tunnel Recess, Front and Top										
Frames or Reverse Frames, Face		180 x 9.5	Bulb Plate							
Bulkhead Stiffeners, Top		100 x 9	Flat bar	Bottom						
Ribband on Top of Decks										
Side Stringers, Top				Bottom						
Web Frames, Sides		400 x 10		and Face	150 x 12					
Brackets, Top		415 x 345		Bottom						
Insulated Hatches, Main				Bilge						Manhole
Hatchway Coamings, Main				Bilge						
Hold Pillars										
Masts										Ventilators 700φ derrick post ventilator
Are insulated plugs fitted to provide easy access to bilge suction roses	No									No
and manhole doors of tanks	No									No
Are insulated plugs fitted to ventilators	Yes									No
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected	No									-
Oil Storage Tanks, where adjacent to the insulated chambers, state what provision has been made for ventilating the air space between the insulation and the bulkhead plating	No									
and for draining the tank top	No									
Fireproof Insulation. Is the insulation and woodwork fireproof in way of bunkers or any surfaces exposed to excessive heat	No									Where
Cooling Pipes pass through watertight bulkheads or deck plating, are the fittings and packing of the stuffing boxes both watertight and fireproof										
Cargo Battens, Dimensions and spacing, sides	75x50	space 300	floors	75x25	space 100	tunnel top				
fixed or portable	Side fixed									
Are screens fitted over the brine grids at chamber sides	No									hinged or permanently fixed
Thermometer Tubes, No. and position in each chamber	One,	at the centre of each ceiling								
diameter	50φ									are they fitted in accordance with Section 3, Clause 8. Yes
Protection of Pipes. Are all pipes, including air and sounding pipes, which pass through or into insulated chambers, well insulated	Yes									
Draining Arrangements. What provision is made for draining the inside of the chambers	50mmφ	Scupper pipe with water sealed								trap fixed
Where sluices, scupper pipes, and drain pipes are fitted are means provided for blanking them off	No									
What provision is made for draining the refrigerating machinery room	2-50φ	Scupper provided								cooler
brine return room										Same as refig. chamber
Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers										to the bilge.

Are thermometers fitted to the outflow and to each return brine pipe... - Where the tanks are closed are they ventilated as per Rule -  
 Where the tanks are not closed is the compartment in which they are situated efficiently ventilated. -  
 Are the number and capacity of the machines and the number of pumps and sea connections in accordance with Section 2, Clause 1 of the Rules.  
 Yes  
 Is the exhaust steam led to the main and auxiliary condensers. -

HYDRAULIC AND OTHER TESTS.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
Engine Cylinders (if tested)	-	-	- lbs.	- lbs.	-	-
Gas Compressors	30-4-55	9 kg/cm2	350 & 200	200 & 150	HI LR	
Separators	21-5-55	"	24.5 & 4	14 kg/cm2	JN, DC LR	
Multiple Effect Receivers	12, 25, 28-3-55	"	24.5 kg/cm2	14 kg/cm2	SM, JN, DC LR	
Condenser Coils	12-3-55					
Cooling batteries	29-3-55	9 kg/cm2	350 lbs.	200 lbs.	SM LR	
Condenser Headers and Connections	16-5-55	"	"	"	YK LR	
Condenser Casings	12-3-55	9 kg/cm2	350 lbs.	200 lbs.	SM LR	
Evaporator Casings	29-3-55	1.5 kg/cm2	4 kg/cm2	-	SM LR	
NH <sub>3</sub> Condenser, Evaporator and Air Cooler Coils after erection in place	-	-	-	-	-	-
Brine Piping after erection in place	-	-	-	-	-	-

Have important steel castings and forgings been tested in accordance with the Rules... Yes  
 Cooling Test. Has the refrigerating machinery been examined under full working conditions, and found satisfactory... Yes  
 Dates of test July 22, 23 & 24 July, 1955 Density of Brine - by - hydrometer  
 Temperatures (when the cargo chambers are cooled down to the required test temperatures) of delivery and return air at direct expansion of the cooling batteries  
 No. 1-18.5°C No. 2-18.0 No. 3-20.0 No. 4-18.0 No. 5-21.0  
 atmosphere. 28°C cooling water inlet and discharge 24.3°C, 26°C gas in condensers 130°C and evaporators -30°C  
 the average temperature of the refrigerated chambers -18°C and the rise of temperature in these chambers upon the expiration of 12 hours time after the machinery and cooling appliances have been shut off. Average 12°C

SPARE GEAR.

Are the working parts of the machines, pumps and motors respectively, interchangeable Yes  
 Has the spare gear required by the Rules been supplied Yes  
 Additional Spare Gear Supplied:-  
 Compressor  
 F 200 type  
 1 set - piston  
 1 set - piston rod  
 2 sets - suction & delivery valve  
 1 set - shaft seal  
 RL 20 type  
 1 set - piston sleeve  
 3 sets - delivery valves  
 1 set - shaft seal  
 1 set - gas regulator valve  
 1 set - driving belt

The foregoing is a correct description of the Refrigerating Machinery.

Sabroe & Co. of Japan Ltd., OSAKA.

mitsui SHIPBUILDING & ENGINEERING CO., LTD., TAMANO WORKS.

S. Tanaka Senior Managing Director, Manufacturer.

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Sounding Pipes, No. and position in each chamber situated below the load water line..... -  
 Diameter..... - Are all sounding pipes in way of insulated chambers fitted in accordance with Section 3, Clause 11..... -  
 Are all wood linings tongued and grooved..... Yes..... Are cement facings reinforced with expanded steel lattice..... -  
 How is the expanded metal secured in place..... -  
 How are the cork slabs secured to the steel structure of the vessel..... Nailed to wood linings which are secured to steel structure

Air Trunkways in Chambers. Are the arrangements satisfactory and in accordance with the approved plans..... Yes  
 Are they permanently fixed or collapsible, or portable..... Permanently fixed

Where air trunkways pass through watertight bulkheads, are they fitted with watertight doors..... No..... Are the door frames efficiently insulated..... -  
 Are insulated plugs supplied for the doorways..... - Where are the doors worked from..... -

Cooling Pipes in ~~Chambers~~ cooler room diameter..... 3.4..... Minimum thickness..... 3.2..... Are they galvanised externally..... Yes

How are they arranged in the chambers..... F-12 direct expansion plain pipe air coolers are installed inside the insulated envelope in each cooler room where is divided by insulated wall from its chamber

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers..... The provision for defrosting by use of both F-12 hot gas and hot sea water are provided.

The foregoing is a correct description of the Insulation and Appliances.  
 Sabroe & Co., of Japan Ltd., OSAKA. *[Signature]* Builders.  
 MITSUI SHIPBUILDING & ENGINEERING CO., LTD., TAMANO WORKS. *[Signature]* Senior Managing Director.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery..... 3-5-55 and Insulation..... 3-5-55  
 (If not, state date of approval)

Is the Refrigerating Machinery and Appliances duplicate of a previous case..... Yes..... If so, state name of vessel..... "Hagurosan Maru"

If the survey is not complete, state what arrangements have been made for its completion and what remains to be done..... -

General Remarks (State quality of workmanship, opinions as to class, &c.).....

The Refrigerating Installation of this vessel has been constructed under Special Survey in accordance with the Rules approved plans and Secretary's letters.

Materials and the workmanship are sound and good.

The Refrigerating Installation has been examined under full working condition and found satisfactory.

In our opinion, the Refrigerating installation of this vessel is worthy to have a record of LLOYD'S RMC 7,55.

*billboard photo*

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	Ice melting capacity per 24 hours.	Is Refrigerating Machinery Electrically Driven?	INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.				No.	Capacity. Cubic ft.
56	6	F-12	The Sabroe Co. of Japan. Mitsui S.B. & E. Co.	July, 1955	(1) F-12 direct expansion. (2) Slab Cork 2 x 2.8	Tons. 4 x 5.23	Yes	5	14,800

Fee..... \$130.913 (Fee applied for, SEP. 12 1955) Received by me,..... 19.....  
 Travelling Expenses \$ See Rpt. 1

Committee's Minute..... FRIDAY 11 NOV 1955

Assigned..... + Lloyd's RMC 7,55

to maintain temp. 0°F with sea temp. 88°F maximum.

Certificate to be sent to Kobe. 10/11/55 Write Kob.

