

Report on Refrigerating Machinery and Appliances.

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(Number of Visits 15)

on the Refrigerating Machinery and Appliances of the m.v. "HOEISAN MARU" Tons Gross 6952.52 Net 3854.60

Vessel built at Tamano, Japan By whom built Mitsui Shipbuilding & Engineering Co., Ltd. Yard No. 581 When built July 1954

Owners Mitsui Steamship Co., Ltd. Port belonging to Tokyo Voyage

Refrigerating Machinery made by The Sabroe Co. of Japan Machine Nos. F-300 30041-4 When made July 1954

Insulation fitted by Mitsui Shipbuilding & Engineering Co., Ltd. When fitted July 1954 System of Refrigeration Brine circulating system using F12 gas

Method of cooling Cargo Chambers by brine grid Insulating Material used Cork board & glass wool

Number of Cargo Chambers insulated 6 Total refrigerated cargo capacity 18,650 cubic feet

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Cooler room: Engine room: Portside of 2nd deck F86-F96 " " main deck F88-F93

Refrigerating Units, No. of 4 No. of machines 4 Is each machine independent Yes

Total refrigeration or ice-melting capacity in tons per 24 hours 4 x 9.5 Are all the units connected to all the refrigerated chambers Yes

Compressors, driven direct or through V-belt Compressors, single or double acting Single multiple effect compression No

Are relief valves or safety discs fitted Yes No. of cylinders to each unit 2 Diameter of cylinders 150 mm

Diameter of piston rod 47 mm Length of stroke 125 mm No. of revolutions per minute 550

Motive Power supplied from Three 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 Mitsui-B & W DE-725 MTH 40 2 or 4 stroke cycle 4 Single or double acting single B.H.P. 350 x 3

No. of cylinders 7 Diameter 245 mm Length of stroke 400 mm Span of bearings as per Rule 315 mm

Maximum pressure in cylinders 55 kg/cm² Diameter of crank shaft journals and pins 170 mm

Breadth and thickness of crank webs 290mm, 90mm No. of sections in crank shaft 1 Revolutions of engine per minute 425

Air Receivers: Have they been made under survey Yes State No. of Report or Certificate AR-19494

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

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

No. of Receivers 1 Cubic capacity of each 0.1 M3 Internal diameter 420mm thickness 11mm

Seamless, lap welded or riveted longitudinal joint Welded Material Steel Range of tensile strength 46.6-52.8 Working pressure by Rules 25kg/cm²

Electric Motors, type Drip-proof, self-ventilation No. of 4 Rated 18.64/13.43 Kilowatts 220 Volts

at 2,400/1,700 revolutions per minute. Diameter of motor shafts at bearings Load side 60φ, commutator side 50φ

Reduction Gearing V-belt Pitch circle diameter, motor pulley 248mm Comp. pulley 1080 mm 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 4 Cast iron or steel casings Steel Plate Cylindrical or rectangular Cylindrical Are safety valves fitted

to casings Yes No. of tubes in each 110 Material of tubes Copper Can each coil be readily shut off or disconnected No

Water Circulating Pumps, No. and size of pumps available x 16 how worked with 4HP motor Gas Separators, No. of 4

Gas Evaporators, No. of 4 Cast iron or steel casings Steel Plate Pressure or gravity type Pressure If pressure type, are safety

valves fitted Yes No. of tubes in each casing 180 Material of tubes Copper Can each coil be readily shut off or disconnected No

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

cleared of snow - No. of coils in each battery - Material of coils - Can each coil be readily shut off or

disconnected - Total cooling surface of battery coils - Is a watertight tray fitted under each battery -

Air Circulating Fans, Total No. of 8 each of 176.6 cubic feet capacity, at 1800 revolutions per minute

Steam or electrically driven Electric Where spare fans are supplied are these fitted in position ready for coupling up No

Brine Circulating Pumps, No. and size of, including the additional pump 3 x 21M³/h x 18m how worked Direct coupled with 5 HP motor

Brine Cooling System, closed or open Closed Are the pipes and tanks galvanised on the inside No

No. of brine sections in each chamber

2 sections for port 3 chambers and starboard 2 chambers

4 sections for starboard 1 chamber (aftermost side)

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

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

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Are thermometers fitted to the outflow and to each return brine pipe. Yes 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 Yes
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) ...	-	-	-	-	-	-
Gas Compressors ...	22-4-54 (2 sets)	8.5 kg/cm ²	2 350 lbs.	200 lbs.	MS HI LR	
„ Separators ...	23-4-54 (2 \")	\"	350 \"	200 \"	YK LR	
„ Multiple Effect Receivers ...	-	-	-	-	-	
„ Condenser Coils ...	23-4-54	8.5 kg/cm ²	350 lbs.	200 lbs.	YK LR	
„ Evaporator Coils ...	30-4-54	\"	350 \"	200 \"	MM LR	
„ Condenser Headers and Connections	23-4-54	\"	350 \"	200 \"	YK LR	
„ Condenser Casings ...	23-4-54	2.5 kg/cm ²	100 \"	-	YK LR	
„ Evaporator Casings ...	30-4-54	2 \"	100 \"	-	MM LR	
NH ₃ Condenser, Evaporator and Air Cooler Coils after erection in place	-	-	-	-	-	
Brine Piping after erection in place...	6-7-54	1.5 kg/cm ²	6.5kg/cm ²	-	JN LR	

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. 7th & 8th July, 1954 Density of Brine 310 by Baume hydrometer
Temperatures (when the cargo chambers are cooled down to the required test temperatures) of delivery and return air at direct expansion or brine cooled batteries - & -, outflow and return brine -26.5°C & -25°C
atmosphere +25.8°C cooling water inlet and discharge 21°C & 22°C gas in condensers 25°C and evaporators -30°C
the average temperature of the refrigerated chambers -20.7°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 about 10°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:-

- 1 Piston complete with rings, suction valve & piston pin
- 1 Connecting rod complete with bearing & bolts
- 2 sets Metal for connecting rod
- 2 \" Main bearings complete
- 3 Suction valves complete with plates, springs & seats
- 1 Delivery valve complete with plate, spring & seat
- 2 Delivery valve plates and springs
- 4 Piston rings for one cylinder
- 4 Oil scrape rings for one cylinder
- 2 Shaft seal assemblies
- 2 Slide rings for shaft seal
- 1 Oil pump complete with strainer
- 2 sets Sieves for suction strainer
- 2 \" Oil level gauge glasses with gaskets
- 2 High & low pressure switches
- 3 Freon 12 pressure gauge
- 1 Oil pressure gauge
- 2 sets V-belt
- 1 Spring of each size used
- 2 Springs for safety head

The foregoing is a correct description of the Refrigerating Machinery.

MITSUBI SHIPBUILDING & ENGINEERING CO., LTD. YAMANO WORKS.

S. Tanaka
Senior Managing Director, Manufacturer.

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. (Fore Peak)	A									
Frame No. 123	A					1.3/8"	Softwood Layerpaper	PS Glasswool	10"	Layer paper soft wood galv. iron pl.
Frame No. 113	A					1.3/8"	\"	\"	4"	\"
Frame No. 103	A					1.3/8"	\"	Cork board	4"	\"
Frame No. 93	F					\"	\"	\"	10"	\"
Portside only	A									
Frame No. 88	F					1.3/8"	\"	Cork board	10"	\"
(S. side only)	A									
Frame No. (Engine rm)	F									
Frame No.	A									
Frame No. (After Peak)	F					1.3/8"	\"	PS No.1 Glass wool other corkboard but	10"	\"
Sides ...						\"	\"	\"	10"	\"
Overheading ...						1.3/16"	\"	\"	10"	\"
Floors of Chambers ...										
Trunk Hatchways ...										
Thrust Recess, Sides and Top ...										
Tunnel Sides and Top ...										
Tunnel Recess, Front and Top ...										

Frames or Reversal Frames, Bars 180 x 9.5 B. EP1
Bulkhead Stiffeners, Top 100 x 12 F.B. Bottom - and Face -
Ribband on Top of Decks. -
Side Stringers, Top - Bottom - and Face -
Web Frames, Sides 400 Depth (Fr. Nos. 96, 117) and Face -
Brackets, Top Web 400x400, Ord. Bkt. 575x415 Bottom - and Face -
Insulated Hatches, Main. - Bilge - Manhole -
Hatchway Coamings, Main. - Bilge -
Hold Pillars. -
Masts, Derrick post 750 mm (Fr. Nos. 102, 103) Ventilators
Are insulated plugs fitted to provide easy access to bilge suction roses. - tank, air, and sounding pipes. - heels of pillars. -
and manhole doors of tanks. - Are insulated plugs fitted to ventilators. - cargo ports. - and side lights. -
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected. - if so, how. -
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. -
and for draining the tank top. -
Fireproof Insulation. Is the insulation and woodwork fireproof in way of bunkers or any surfaces exposed to excessive heat. - 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. 1"x3" Spacing 4" floors. 1.1/8"x3" Spacing 4" Tunnel top. -
fixed or portable. Portable. Are screens fitted over the brine grids at chamber sides. - No. Hinged or permanently fixed.
Thermometer Tubes, No. and position in each chamber. One in each chamber overheadings (It rises up to shelter deck)
diameter. 2" 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. -
Draining Arrangements. What provision is made for draining the inside of the chambers. 2" scupper pipe is fitted.
Where sluices, scupper pipes, and drain pipes are fitted are means provided for blanking them off. The seal trap is provided to scupper pipe.
What provision is made for draining the refrigerating machinery room. No.
brine return room. - fan room. - water circulating pump room. -
Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers. Yes, to be bilge wells in eng. room.

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..... nailed to the wood linings which are on the grounds secured
How are the cork slabs secured to the steel structure of the vessel..... to steel structure.....
Air Trunkways in Chambers. Are the arrangements satisfactory and in accordance with the approved plans.....
Are they permanently fixed or collapsible, or portable.....

Where air trunkways pass through watertight bulkheads, are they fitted with watertight doors..... Are the door frames efficiently insulated..... Yes.....
Are insulated plugs supplied for the doorways..... No..... Where are the doors worked from..... from No. 3 upper tween deck.....

Cooling Pipes in Chambers, diameter..... Out dia. 48.6 mm..... Minimum thickness..... 3.5 mm..... Are they galvanised externally..... Yes.....
How are they arranged in the chambers..... They arranged on ceiling, and side walls by means of hanging bolts and coach screw which contact to ship structure.....

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers..... Hot brine.....

The foregoing is a correct description of the Insulation and Appliances.

MITSUBI SHIPBUILDING & ENGINEERING CO., LTD., YAMATO WORKS.

Senior Managing Director..... Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery..... 21-6-54..... and Insulation..... 21-6-54.....
(If not, state date of approval)
Is the Refrigerating Machinery and Appliances duplicate of a previous case..... No..... If so, state name of vessel.....
If the survey is not complete, state what arrangements have been made for its completion and what remains to be done..... Complete.....

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.

The materials and workmanship are sound and good.

The refrigerating installation has been examined under working condition and found satisfactory.

In our opinions the Refrigerating Installation of this vessel is worthy to have a record of +LLOYD'S RMC 7.54 to maintain temperature 0° F with sea temperature 90° F maximum.

Bisulphidefluoromethane

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	Ice melting capacity per 24 hours. Tons.	Is Refrigerating Machinery Electrically Driven?	INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.				No.	Capacity. Cubic ft.
4	4	F-12	The Sabroe Co. of Japan	May 1954	(1) Brine circulation using F-12 4x975		Yes	6	18,650
Fee £ 56.150					(2) Cork board & glass wool				
Travelling Expenses £ : :					Received by me, 19.....				

WEDNESDAY 31 DEC 1954

Committee's Minute.....

Assigned..... + Lloyd's RMC 7.54
to maintain temp 0° F with sea
temp 90° F max.

CERTIFICATE WRITTEN.

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