

Report on Refrigerating Machinery and Appliances.

3-JUN1954

MAY 27, 1954

Received at London Office

Date of writing Report 19... When handed in at Local Office 19... Port of KobeNo. in Reg. Book. Survey held at Tamano Date: First Survey 8-2-54 Last Survey 29th March, 1954
(Number of Visits 10)on the Refrigerating Machinery and Appliances of the m.v. "HAKONESAN MARU" Tons { Gross 6227.05
Net 3638.75
Vessel built at Tamano, Japan By whom built Mitsui Shipbuilding & Engineering Co., Ltd. Yard No. 580 When built March, 1954
Owners Mitsui Steamship Co., Ltd. Port belonging to Tokyo Voyage F200-2006/9Refrigerating Machinery made by The Sabroe Co. of Japan Machine Nos. F100-1041/42 When made March, 1954
Insulation fitted by Engineering Co., Ltd. When fitted March 1954 System of Refrigeration Air circulation by F12 direct expansion
Method of cooling Cargo Chambers by plain pipe air cooler Insulating Material used Slab cork
Number of Cargo Chambers insulated 5 Total refrigerated cargo capacity 14,800 (net) cubic feet

DESCRIPTION OF REFRIGERATING MACHINERY.

Where placed Port side 2nd deck of engine room
Refrigerating Units, No. of 6 No. of machines 6 Is each machine independent Yes
Total refrigeration or ice-melting capacity in tons per 24 hours 4x5.23 Are all the units connected to all the refrigerated chambers Yes
Compressors, driven directly through electric motor through reduction gearing Compressors, single or double acting Single If multiple effect compression No
Are relief valves or safety discs fitted Yes No. of cylinders to each unit 2 Diameter of cylinders F-200 125 mm
Diameter of piston rod 100mm x 4 sets Length of stroke 80mm x 2 No. of revolutions per minute 600 x 4 sets
Dia. of connecting rod 32 mm & 25 mm 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 B&W DE725MTH-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 425Air Receivers:—Have they been made under survey Yes State No. of Report or Certificate AR-19213
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 420 mm thickness 11 mm
Seamless, lap welded or riveted longitudinal joint Welded Material steel Range of tensile strength 46.5-52.8 kg/cm² Working pressure by Rules 25 kg/cm²
Electric Motors, type Drip-proof, self-ventilation No. of 6 Rated 5.5/3.4 Kilowatts 220 Volts 1800/1100
Revolutions per minute 2400/1800 Diameter of motor shafts at bearings 60, 55 (couple side)
Reduction Gearing V-belt Dia. of pulley of motor F200-160mm Dia. of pulley of compr. F100-177mm Main wheel F200-600mm Width of face F100-500mm
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 Yes
No. of tubes 96, 66 Material of coils Copper Can each coil be readily shut off or disconnected No
Water Circulating Pumps, No. and size of pumps available x 16M how worked with 4HP motor Gas Separators, No. of 6Gas 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 Brine Cooled 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 1 (2, 3) (4, 5) Material of coils Steel Can each coil be readily shut off or disconnected Yes
Total cooling surface of battery coils 810 440 609 M² Is a watertight tray fitted under each battery YesAir Circulating Fans, Total No. of 5 each of 14.5 6.5 11.5 M³ cubic feet capacity, at 2200 (2400) (4, 5) 2500 revolutions per minute
Steam or electrically driven Electrically Where spare fans are supplied are these fitted in position ready for coupling up YesBrine 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 —

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...
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) ...	8-2-54	9 kg/cm ²	350 lbs.	200 lbs.	MS LR	
Gas Compressors ...	12-2-54	"	350 "	200 "	MS LR	
Separators ...	13-2-54	"	350 "	200 "	MS LR	
Multiple Effect Receivers ...	3-2-54	9 kg/cm ²	350 lbs.	200 lbs.	MS LR	
Condenser Coils ...	3-2-54	9 kg/cm ²	350 lbs.	200 lbs.	MS LR	
Evaporator Coils ...	3-2-54	9 kg/cm ²	350 lbs.	200 lbs.	MS LR	
Condenser Headers and Connections	3-2-54	"	350 "	200 "	"	
Condenser Casings ...	3-2-54	"	350 "	200 "	"	
Evaporator Casings ...	3-2-54	"	350 "	200 "	"	
NH ₃ Condenser, Evaporator and Air Cooler Coils after erection in place	3-2-54	"	350 "	200 "	"	
Brine Piping after erection in place...	3-2-54	"	350 "	200 "	"	

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. 26th March, 1954 Density of Brine... by... hydromet
Temperatures (when the cargo chambers are cooled down to the required test temperatures) of delivery and return air at direct expansion...
-19°C & -17°C & outflow and return brine...
atmospheric 17°-14° cooling water inlet and discharge. 11° & 12°C gas in condensers 15 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 abt. 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:-

Compressor

- 1 set - piston for each compressor
- 1 " - connecting rod for each compressor
- 1 " - suction & delivery valve for each compressor
- 2 " - shaft seals complete for each compressor
- 2 " - main bearing complete
- 4 sets- piston ring for one cylinder of each compressor
- 2 " - oil scrape rings for one cylinder
- 2 Freon 12 pressure gauges
- 1 Oil pressure gauge
- 1 Spring of each size used
- 10% inside tubes for condenser
- 1 set - condenser level gauge glass with gasket

The foregoing is a correct description of the Refrigerating Machinery.

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

Senior Managing Director.

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. 123 A						35mm	1-16mm Soft wood	Cork board	225√mm	16+25mm soft wood
side only							2-layer paper			2-layer paper
Frame No. 115 A							25+16mm soft w.	"	150√mm	"
between cooler room							2-layer paper			
Frame No. 113 A						35mm	1-16mm soft w.	"	150√"	"
side only							2-layer p.			
Frame No. 105 A							25+16mm soft w.	"	150√"	"
Between cooler room							2-layer p.			
Frame No. 103 A						35 mm	1-16mm soft w.	"	150 "	"
between cooler room							2-layer p.			
Frame No. 90 A							25+16mm soft w.	"	150√"	"
between cooler room							2-layer p.			
Frame No. 88 A						35mm	1-16mm soft w.	"	100√"	"
cooler rm. aft							2-layer p.			
Frame No. ... A						35 "	"	"	100√"	"
Frame No. ... F						85 "	"	"	100√"	"
Frame No. ... A						30 "	"	"	100√"	"
Frame No. ... F						35 "	"	"	225√"	16mm+25mm soft w.
(After Peak)										2-layer p.
Sides ...						35 "	"	"	225√"	"
Overheading ...						30 "	"	"	225√"	"
Floors of Chambers ...										
Trunk Hatchways ...										
Thrust Recess, Sides and Top										
Tunnel Sides and Top										
Tunnel Recess, Front and Top										

Frames or Reverse Frames... 180 x 9.5 bulb plate
Bulkhead Stiffeners, Top 100 x 9 flat bar Bottom and Face
Ribband on Top of Decks...
Side Stringers, Top... Bottom and Face
Web Frames, Sides 400 x 10 and Face 150 x 12
Rackets, Top 415x575 Tween dk. fr. & Bottom and Face
Insulated Hatches, Main 400x400 Web fr. and Face
Hatchway Coamings, Main Bilge Manhole
Old Pillars... Bilge
ists... Ventilators 2 1/2" dia. ventilator hole each chamber
Are insulated plugs fitted to provide easy access to bilge suction roses... No tank, air, and sounding pipes... No heels of pillars... No
Are insulated plugs fitted to ventilators... Yes cargo ports... No and side lights... No
the insulation of the lower hold floor and tunnel top in way of the hatchways protected... No if so, how...
Storage Tanks, where adjacent to the insulated chambers, state what provision has been made for ventilating the air space between the insulation
the bulkhead plating... No
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
Pipes pass through watertight bulkheads or deck plating, are the fittings and packing of the stuffing boxes both watertight and fireproof... Yes
Go Batts, Dimensions and spacing, sides 25x75 Spacing 150 floors 75x25 Spacing 100 tunnel top
Side-fixed
Floor-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; at the center of each ceiling
eter 50 mm are they fitted in accordance with Section 3, Clause 8... Yes
ection of Pipes. Are all pipes, including air and sounding pipes, which pass through or into insulated chambers, well insulated
ing Arrangements. What provision is made for draining the inside of the chambers... 50mm scupper pipe with water sealed trap fitted. No
re sluices, scupper pipes, and drain pipes are fitted are means provided for blanking them off... No
t provision is made for draining the refrigerating machinery room... 2 - 50 mm scuppers provided. Cooler room:
return room... fan room...
air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers... Yes

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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..... Are the door frames efficiently insulated.....

Are insulated plugs supplied for the doorways..... Where are the doors worked from.....

Cooling Pipes in Chambers, diameter..... 34 mm..... Minimum thickness..... 3.2 mm..... Are they galvanised externally..... Yes

How are they arranged in the chambers..... Fitted to coolers, installed at the aft end in each chamber.

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

F12 hot gas, fresh and sea water shower

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

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

S. Tanaka
Senior Managing Director. Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery..... 30-3-54 and Insulation..... 30-3-54
(If not, state date of approval) Except defrosting arrangement

Is the Refrigerating Machinery and Appliances duplicate of a previous case..... No..... If so, state name of vessel..... (plan now in hand for approval)

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

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.

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 opinion the Refrigerating Installation of this vessel is worthy to have a record of +LLOYD'S RMC 3,54 to maintain temperature 0°F with sea temperature 90°F maximum.

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.
5	6	F-12	The Sabroe Co. of Japan	Mar. 1954	Air circu- lation by F-12 direct expansion slab cork	4x5.23 2x2.79	Yes	5	14 300

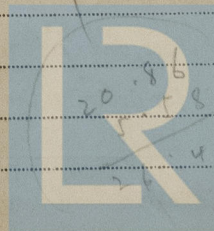
Fee..... \$136.08/4 (Fee applied for, MAY 27, 1954, 19.....)

Travelling Expenses..... \$100.00 (Received by me, 19.....)

Committee's Minute..... TUESDAY 10 AUG 1954

Assigned..... *W. K. Kob*

S. Tanaka
Surveyor to Lloyd's Register.



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Foundation