

Rpt. 17.

No. FE835

# Report on Refrigerating Machinery and Appliances.

Refrigerated Cargo Installation

Received at London Office. **11 FEB 1958**  
Nagasaki (Shimonoseki)

Date of writing Report 19... When handed in at Local Office 19... Port of Nagasaki (Shimonoseki)

No. in Reg. Book. Survey held at Nagasaki Date: First Survey 20-7-1957 Last Survey 7-1-1958  
(Number of Visits 12)

Refrigerated Cargo Installation on the ~~Refrigerating Machinery and Appliances~~ of the M.V. "KOBU MARU" Tons (Gross 9,202 Net 5,345)

Vessel built at Nagasaki By whom built Mitsubishi Zosen K.K. Nagasaki Works Yard No. 1198 When built 1958-1

Owners Daido Kaiun K.K. Port belonging to Kobe Voyage International

Refrigerating Machinery made by Sabroe Co. of Japan Ltd. Machine Nos. 330068 330069 330070 When made 1958-1

Insulation fitted by Mitsubishi Zosen K.K., Nagasaki Works When fitted 1958-1 System of Refrigeration Dichloro difluoro methane

Method of cooling Cargo Chambers Direct expansion & Air Insulating Material used Glass Wool

Number of Cargo Chambers insulated 4 Total refrigerated cargo capacity 11,273 cubic feet

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed on 3rd deck of mach. space, star'd. fw'd.

Refrigerating Units, No. of 3 No. of machines 3 Is each machine independent Yes

Total ~~refrigerated~~ ice-melting capacity in tons per 24 hours 34.5 Are all the units connected to all the refrigerated chambers Yes

Compressors, driven ~~by~~ pulley & belts ~~through~~ Compressors, single or double acting Single If multiple effect compression Yes

Are relief valves or safety discs fitted Yes No. of cylinders to each unit 2 LP & 1 HP Diameter of cylinders 150mm. 500/250

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

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 -

~~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 Semi-enclosed, drip-proof No. of 3 Rated 30/15 HP ~~Revolutions~~ A.C. 440 Volts

at 1800/900 revolutions per minute. Diameter of motor shafts at bearings 65mm

Reduction Gearing Pulley & belt Motor pulley 229mm Main wheel 784mm No. of belt 4

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 90mm.

Gas Condensers, No. of 3 Cast iron or steel casings Steel Plate Cylindrical or rectangular Cylindrical Are safety valves fitted

to casings Yes No. of tubes 158 (Working 2) tube Material of coils Alpac Tube Can each coil be readily shut off or disconnected -

Water Circulating Pumps, No. and size of pumps available 2x32M<sup>3</sup>/H how worked Electric Motor Gas Separators, No. of 3 HP. & 3L.P.

Gas Expanders ~~Cast iron or steel casings~~ - Pressure or gravity type - If pressure type, are safety valves fitted -

Direct Expansion ~~of Brine Cooled~~ Batteries, No. of 8 Are there two separate systems, so that one may be in use while the other is being

cleared of snow Yes No. of coils in each battery 4 Material of coils Steel tube Can each coil be readily shut off or

disconnected No Total cooling surface of battery coils 294M<sup>2</sup> Is a watertight tray fitted under each battery Yes

Air Circulating Fans, Total No. of 4 each of 95/75 cubic feet capacity, at 1800/1200 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.

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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)	-	-	-	-	-	-
Gas Compressors	3-7-57	-	350 LBS	200 LBS	YK	Tested by Kobe Survey
Separators	12-7-57	-	350 LBS	200 LBS	HN	Ditto
Interstage Coolers	12-7-57	-	350 LBS	200 LBS	HN	Ditto
Condenser Coils	-	-	-	-	-	-
Air Coolers	31-7-57	=	350 LBS	200 LBS	JN	Tested by Kobe Survey
Condenser Headers and Connections	-	-	-	-	-	-
Condenser Casings & Tubes	12-7-57	-	350 LBS	200 LBS	HN	Tested by Kobe Survey
Evaporator Casings	-	-	-	-	-	-
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 22, 23, 24/12/1957 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 P.F. -21.3 P.A. -20.4 S.F. -22.6 & S.A. -22.0 outflow and return brine - & - atmosphere 8°C cooling water inlet and discharge 15°C & 15.5°C gas in condensers 24°C Air Coolers -23.2°C the average temperature of the refrigerated chambers -19°C and the rise of temperature in these chambers upon the expiration of - hours time after the machinery and cooling appliances have been shut off P.F. 5.9°C P.A. 6.3°C S.F. 6.2°C S.A. 6.8°C rise

**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: -

The foregoing is a correct description of the Refrigerating Machinery.

for Sabroe Co. of Japan Ltd.

**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.	F									
Frame No. 120 (Fwd end P & S)	F							glass wool	10"	timber
Frame No. 104 1/2 (Chamber division)	F							glass wool	5"	timber
Frame No. 94 (Boiler Room)	F							glass wool	11"	timber
Frame No. (Engine Room)	F							glass wool	2"	galv. steel sheet
Frame No.	A									
Frame No.	F									
Frame No.	A									
Frame No.	F									
Frame No.	A									
Frame No. (After Peak)	F					56.5mm	timber	glass wool	10"	timber
Sides						103mm	timber	glass wool	9"	timber
Overheading								glass wool	8"	Notex on timber
Floors of Chambers										
Trunk Hatchways and in way of passage between aft chambers								glass wool	10"	timber
Thrust Recess, Sides and Top										
Tunnel Sides and Top										
Tunnel Recess, Front and Top										
Frames or Reverse Frames, Face								4" glass wool		
Bulkhead Stiffeners, Top										
Bulkhead Stiffeners, Bottom										
Ribband on Top of Decks										
Side Stringers, Top										
Side Stringers, Bottom										
Web Frames, Sides										
Brackets, Top										
Brackets, Bottom										
Insulated Hatches, Main										
Hatchway Coamings, Main										
Hold Pillars										
Masts										
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 Yes										
Cargo Battens, Dimensions and spacing, sides 50 x 50/300mm floors 25x75/100 on 50x50/250mm tunnel top										
fixed or portable floors portable battens fitted over the brine grids at chamber sides hinged or permanently fixed										
Thermometer Tubes, No. and position in each chamber 1 and position as per approved plan No. P.508 approved date 25-3-57 Kobe										
diameter 2 1/2" 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 Yes										
Draining Arrangements. What provision is made for draining the inside of the chambers 2 x 2 1/2" scuppers with liquid sealed trap in each chamber										
Where sluices, scupper pipes, and drain pipes are fitted are means provided for blanking them off										
What provision is made for draining the refrigerating machinery room 3 x 50mm scupper pipes to mach. space bilge										
brine return room fan room 1x3" scupper pipe with liquid sealed trap water circulating pump room Mach. space										
Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers Yes to hold bilge										

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.....

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..... Minimum thickness..... Are they galvanised externally.....

How are they arranged in the chambers.....

The refreshing air trunkways fitted with volves at water tight bulkheads.

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

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

*S. Koga*  
NAGASAKI WORKS

For Sabroe Co. of Japan Ltd Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery..... 2-4-56 and Insulation.....

Is the Refrigerating Machinery and Appliances duplicate of a previous case. Yes..... If so, state name of vessel. M.V. "KOSOH MARU"

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

Water Defrosting System:- Salt water defrosting system, a portable hose connection has been made between sanitary tank and deflost line on compass bridge deck and a notice board has been fitted stating that this connection is only to be placed during the actual defrosting operation. Other notice board has been fitted in Refrigerating Machinery Room stating that during defrosting the bilge pumps are to be started on No.3 hold bilge wells.

Air cooler fan output	Static Pressure in m.m. water	30	26	34	35
	(Air CFM)	4740	4760	4600	4470
	(Fan Speed x p.m.)	1750	1750	1750	1750
	(Motor Capacity (A.C. 450V) Amp.)	3.4	3.5	3.5	3.4
	(Cargo Chamber)	P.F.	P.A.	S.F.	S.A.

General Remarks (State quality of workmanship, opinions as to class, etc.)  
The Refrigerated Cargo Installations of this ship have been constructed under specially survey in accordance with the requirements of the Rules, the approved plans and the Secretary's letters. The materials and workmanship are sound and good.

On completion of installation on board, the refrigeration test was carried out with satisfactory results. The air cooler defrosting arrangement was examined, tested and found in good order.

It is submitted that the Refrigerated Cargo Installations of this ship are eligible to have the class notation of Lloyd's RMC to maintain temp. 0°F. with sea temp. 90°F. max. 1/58.

For the report on survey of the Refrigerating Plant during construction in the shops, please see Kobe Surveyors certificates Nos. M-39817, 42088, 42166, 42471, 42602, 43211, 43832, 43833 and Nagasaki Surveyors certificate M-3928, copy of each attached herewith.

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.
3	3	Dechloro-defluoro-methane	Sabroe Co. of Japan Ltd.	1958-1	1) Direct Expansion & Air 2) Glass wool	34.5	Yes	4	11,273

Installation/Insulation Fee £ Y50;200 : (Fee applied for, FEB - 5, 1958 LOCALLY)

Travelling Expenses £ : : (Received by me, 19.....)

*[Signature]*  
Surveyor to Lloyd's Register.

FRIDAY - 7 MAR 1958

Committee's Minute.....

Assigned..... + Lloyd's RMC 1.58

"to maintain temp. 0°F. with sea temp 90°F. maximum."  
CERTIFICATE WRITTEN

Certificate to be sent to: Smk. Nagasaki

