

# Report on Refrigerating Machinery and Appliances.

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No. in Reg. Book. Survey held at Oka & Nagasaki Date: First Survey 9-4-56 Last Survey 5-6-1956  
36405 (Number of Visits 10)

on the Refrigerating Machinery and Appliances of the M.T. "KOSOH MARU" Tons (Gross 9204.74 Net 5349.95)

Vessel built at Nagasaki, Japan By whom built Mitsubishi Zosen K.K. Yard No. 1465 When built 6-1956

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

Refrigerating Machinery made by Sabroe Co. of Japan Ltd Machine Nos. 330041  
330042  
330043 When made 12-1955

Insulation fitted by Mitsubishi Zosen K.K. When fitted 6-1956 System of Refrigeration Bichloro-difluoro-methane

Method of cooling Cargo Chambers Direct expansion and Air Insulating Material used Glass wool

Number of Cargo Chambers insulated 4 Total refrigerated cargo capacity 11,600 cubic feet

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed on 3rd deck of Tricky space, starboard fwd.

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

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

Compressors, driven direct or through single pulley and belt reduction gearing. 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 L.P. & 1 H.P. Diameter of cylinders 150 mm

Diameter of piston rod - Length of stroke 125 mm No. of revolutions per minute 500/250

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 Strip-proof No. of 3 Rated 30/15 H.P. Kilowatts 440 A.C. Volts

at 1750/880 revolutions per minute. Diameter of motor shafts at bearings 65 mm

Reduction Gearing Pulley and belt Pitch circle diameter, motor pulley 229 mm Main wheel 784 mm No. of belts 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 75 mm

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

to casings Yes No. of tubes 158 (working 2) in each 1.78 (standard 1) Material of tubes Alumi. brass Can each coil be readily shut off or disconnected -

Water Circulating Pumps, No. and size of pumps available 2 at 32 t/h how worked Electric motors Gas Separators, No. of 3 H.P. 3 L.P.

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 Brine Cooled Batteries, No. of 4 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 3 x 2 Material of coils Steel Can each coil be readily shut off or

disconnected No Total cooling surface of battery coils 252.8 m<sup>2</sup> Is a watertight tray fitted under each battery Yes

Air Circulating Fans, Total No. of 4 1/2 hp. impeller each of 95 cubic feet capacity, at 1730 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 -

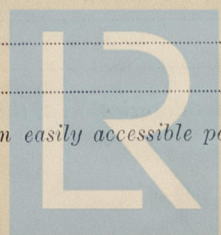
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Can each section be readily shut off or disconnected - Are the control valves situated in an easily accessible position -

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 ...	26-12-55	—	350 lb	200 lb	HI	Tested by Kobe Surveyors
„ Separators ...	6-2-56	—	350 lb	200 lb	MH	Tested by Kobe Surveyors
„ Multiple Effect Receivers ...	6-2-56	—	350 lb	200 lb	MH	Tested by Kobe Surveyors
„ Condenser Coils ...	—	—	—	—	—	—
„ <i>air coolers</i> Evaporator Coils ...	25-2-56	—	350 lb	200 lb	YK	Tested by Kobe Surveyors
„ Condenser Headers and Connections ...	6-2-56	—	350 lb	200 lb	MH	Tested by Kobe Surveyors
„ Condenser Casings and Tubes ...	6-2-56	—	350 lb	200 lb	MH	Tested by Kobe Surveyors
„ 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 for six hours*  
Dates of test. *29.30.31-5-56* 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 or brine cooled batteries *P. fwd -24°C. P. aft -24°C. S. fwd -24.5°C. & S. aft -26°C.* outflow and return brine — & —  
atmosphere *18-22°C.* cooling water inlet and discharge *19.5°C. & 22°C.* gas in condensers *29°C.* and *air coolers* *-30°C.*  
the average temperature of the refrigerated chambers *-19°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 *P. fwd 10 P. aft 9 S. fwd 9 S. aft 9 °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.

*L. Koga*  
for Sakobe Co., Japan, Ltd., Osaka

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.	F									
Frame No.	A									
Frame No. 120 (Fore and Peak)	F									
	A							glass wool	10"	timber
Frame No. 104 (Chamber division)	F							glass wool	5"	timber
	A							glass wool	5"	timber
Frame No. 94 (Boiler Room)	F							glass wool	11"	timber
	A							glass wool	2"	gal. steel sheet
Frame No. (Engine Room)	A									
Frame No.	F									
	A									
Frame No.	F									
	A									
Frame No.	F									
	A									
Frame No. (After Peak)	F									
Sides ...						55mm timber		glass wool	10"	timber
Overheading ...						100mm timber		glass wool	9"	timber
Floors of Chambers ...								glass wool	8"	rustic on timber
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 — Bottom — *fore and aft 4" glass wool*  
Ribband on Top of Decks — *Back beams face 4" glass wool; Long girders face and side 3" glass wool*  
Side Stringers, Top — Bottom — and Face —  
Web Frames, Sides — and Face —  
Brackets, Top — Bottom — and Face *3" glass wool*  
Insulated Hatches, Main — Bilge — Manhole —  
Hatchway Coamings, Main — Bilge —  
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 *50x50/300 mm* floors *25x75/100 mm 50x50/250 mm* tunnel top. —  
fixed or portable *fixed* Are screens 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. PS08 approved date 2-4-56 (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 *2x2 1/2" scupper with liquid sealed traps 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 *3x50 mm dia. scupper pipes to bilge space bilge*  
brine return room. — *each fan room 1x3" scupper with liquid sealed trap water circulating pump room — traps placed in each space*  
Are all air spaces behind insulation arranged to drain to the bilges, bilge wells, or gutterways of the respective chambers. *Yes to hold bilges*



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. *more faces* 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 valves at watertight 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

Builders.

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

Water Discharging System: — In salt water discharging system a portable hose connection has been made between sanitary tank and disport line on compass bridge deck and a notice board has been fitted stating that this connection is only to be placed during the actual disporting operation. Other notice board has been fitted in refrigerating machine room stating that during disporting the bilge pumps are to be started on No. 3 hold bilge wells.

Air cooler fan outputs: —  
static pressure mm. water 43.5 44 43 39  
air vol. m. per min. 103.6 120.89 111.75 113.4  
fan speed r.p.m. 1785 1790 1790 1780  
water capacity (A.C. 420V) 2.5A 2.3A 2.2A 2.35A  
P. fwd. P. aft. S. fwd. S. aft.

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

The Refrigerated Cargo Installations of this ship have been constructed under special survey in accordance with the requirements of the Rules, the approved plans and the Secretary's letters.

The materials and workmanship are good.

On completion of installation on board the refrigeration test was carried out with satisfactory results. The air cooler disporting 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  $\pm$  Lloyd's RMC to maintain temp. 0°F. with sea temp. 90°F. max.  $\pm$  6/56.

For the report on survey of the Refrigerating Plant during construction in the shops, see Kobe Surveyor's certificates Nos. M-28883, M-28610, M-32617, M-29042, M-29147 and P-30237, copy of each attached herewith.

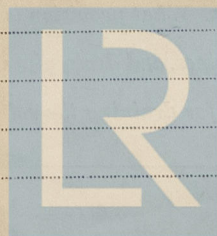
#### PARTICULARS TO BE ENTERED IN REGISTER BOOK.

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	Dichloro- difluoro- methane	Sabroe Co. of Japan	1956	(1) Direct Expansion & air (2) glass wool	Tons. 34.5	Yes.	4	Cubic ft. 116.00

Fee  $\yen52,250$  (Kobe) 8/6/56  
 $\yen50,200$  : Fee applied for, 19.  
Travelling Expenses  $\pounds$  : Received by me, 19.

Committee's Minute. MONDAY 28 AUG 1956

Assigned.  $\pm$  Lloyd's RMC 6.56  
to maintain temp 0°F with sea temp 90°F max.



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