

# REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

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- 3 SEP 1945

Date of writing Report 29-4 19 43 When handed in at Local Office 2-5-44 Port of Oslo  
 No. in Reg. Book. Survey held at Drammen Date: First Survey 14-3-41 Last Survey 14-5-1943  
 (No. of Visits 2)

on the Refrigerating Machinery and Appliances of the ✓  
 Vessel built at Gothenburg By whom built AB. Gotaverken Yard No. 561 When built ✓  
 Owners ✓ Port belonging to ✓ Voyage ✓  
 Refrigerating Machinery made by As. Drammens Jernst. & M.V. Machine Nos. 1787 40  
1788 40  
1789 40 When made 1943  
1790 40  
 Insulation fitted by ✓ When fitted ✓ System of Refrigeration NH<sub>3</sub>  
 Method of cooling Cargo Chambers Brine & Air Insulating Material used ✓  
 Number of Cargo Chambers insulated 4 fruit + 1 frozen fish Total refrigerated cargo capacity 98000 cubic feet.

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed ✓

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 65 Are all the units connected to all the refrigerated chambers no  
 Compressors, driven direct through reduction gearing. Compressors, single or double acting single acting If multiple effect compression  
 are relief valves or safety discs fitted no multiple effect No. of cylinders to each unit 2 Diameter of cylinders 2 1/4 170 mm.  
2 1/4 140 mm.  
 Diameter of piston rod 5 Length of stroke 2 1/4 180 mm., 2 1/4 160 mm. No. of revolutions per minute abt. 400  
 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:—Is each receiver, which can be isolated, fitted with a safety valve as per Rule

Can the internal surfaces of the receivers be examined ✓ What means are provided for cleansing their inner surfaces ✓  
 Is there a drain arrangement fitted at the lowest part of each receiver ✓ If made under survey ✓  
 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 D.C. No. of 4 Rated 41 1/2 24 Kilowatts 220  
 Volts at abt. 400 revolutions per minute. Diameter of motor shafts at bearings in mm. 120 & 95 for 41 Kw., 105 & 80 for 24 Kw.

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 4 Cast iron or steel casings Shell, tube type Cylindrical or rectangular ✓ Are safety valves fitted ✓  
 to casings ✓ No. of coils in each ✓ Material of coils ✓ Can each coil be readily shut off or disconnected ✓

Water Circulating Pumps, No. and size of 2 1/4 12 1/2 sec., 2 1/4 5 1/2 sec. how worked by electric motors Gas Separators, No. of 4  
 Gas Evaporators, No. of 4 Cast iron or steel casings Shell & tube type Pressure or gravity type Pressure If pressure type, are safety  
 valves fitted yes 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 6 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 2-4-6-8 Material of coils Seamless steel Can each coil be readily shut off or  
 disconnected yes Total cooling surface of battery coils 9700 sq. ft. Is a watertight tray fitted under each battery ✓

Air Circulating Fans, Total No. of 8 each of 4-450 cubic feet capacity, at 910 revolutions per minute 810  
 Steam or electrically driven electrically Where spare fans are supplied are these fitted in position ready for coupling up not supplied

Brine Circulating Pumps, No. and size of, including the additional pump 2 centrifugal, each 12 1/2 sec. how worked by electric motors  
 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

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



Rp 17 5796

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)	✓					
GAS COMPRESSORS	14-3-41.	13 1/4 /cm <sup>2</sup>	42 1/4 /cm <sup>2</sup>	25 1/4 /cm <sup>2</sup>	14-3-41. 3rd.	
" SEPARATORS	14-5-43.	"	"	"	14-5-43. SW.	
" MULTIPLE EFFECT RECEIVERS	"	"	"	"	"	
" CONDENSERS	"	"	"	"	"	
" EVAPORATORS	"	"	"	"	"	
" CONDENSER HEADERS AND CONNECTIONS	"	"	"	"	"	
" CONDENSER CASINGS	✓					
" 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  
Dates of test *Density of Brine* by *hydrometer*  
**Temperatures** (when the cargo chambers are cooled down to the required test temperatures)  
or, delivery and return air at direct expansion or brine cooled batteries & outflow and return brine &  
atmosphere cooling water inlet and discharge & gas in condensers and evaporators  
the average temperature of the refrigerated chambers and the rise of temperature in these chambers upon the expiration of hours  
time after the machinery and cooling appliances have been shut off

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  
Additional Spare Gear Supplied: *Spare gear stated to be supplied according to Specification. Same to be examined and verified when the plant is completed.*

The foregoing is a correct description of the Refrigerating Machinery.

4/5 Dimensions correct & met. Verified

*Mangier*

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.	F									
FRAME NO.	A									
FRAME NO.	F									
FRAME NO. (Boiler Room)	A									
FRAME NO. (Engine Room)	A									
FRAME NO.	F									
FRAME NO.	A									
FRAME NO.	F									
FRAME NO.	A									
FRAME NO.	F									
FRAME NO.	A									
FRAME NO. (After Peak)	F									
SIDES										
OVERHEADING										
FLOORS OF CHAMBERS										
TRUNK HATCHWAYS										
THRUST RECESS, SIDES AND TOP										
TUNNEL SIDES AND TOP										
TUNNEL RECESS, FRONT AND TOP										

FRAMES OR REVERSE FRAMES, FACE  
BULKHEAD STIFFENERS, TOP BOTTOM AND FACE  
RIBBAND ON TOP OF DECKS  
SIDE STRINGERS, TOP BOTTOM AND FACE  
WEB FRAMES, SIDES AND FACE  
BRACKETS, TOP BOTTOM AND FACE  
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  
**Cargo Battens,** Dimensions and spacing, sides floors tunnel top  
fixed or portable Are screens fitted over the brine grids at chamber sides hinged or permanently fixed  
**Thermometer Tubes,** No. and position in each chamber  
diameter are they fitted in accordance with Section 3, Clause 8  
**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  
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  
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



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 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

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

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

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.

Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery Appn. 12-1940 and Insulation (If not, state date of approval)

Is the Refrigerating Machinery and Appliances duplicate of a previous case yes. If so, state name of vessel AB. Gotenborg yard nos. 553-54.

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

Survey of the machinery during erection on board and testing of same when completed.

This is to be done at Gotenborg.

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

All parts of the above machinery, constructed at Hammen, have been carefully examined throughout.

The workmanship, including the electric welding, appears to be very good. All hydraulic & air tests were carried out with satisfactory results.

It is recommended that this vessel's refrigerating machinery, when completed, be classed in the Society's Register Book with notation of ~~Classed~~ RMC with appropriate date.

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	Ammonia	As Ammonia Inst. & Cork Insulated.	1943.	1) Brine & Air. 2) Sprayed Cork.	65	yes.	5	98000.

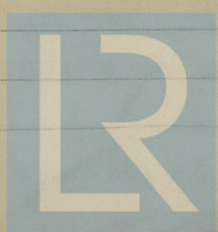
Fee ..... £ : : { Fee applied for, 19 ..  
Travelling Expenses £ : : { Received by me, 19 ..

Ernst W. H. Wray

Surveyor to Lloyd's Register.

Committee's Minute Fri. 12 OCT. 1945

Assigned. see minute on  
Got. 14385



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Foundation