

# REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

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Date of writing Report 17. 9. 1941 When handed in at Local Office 17. 9. 41 Port of Liverpool  
 No. in Reg. Book. 31254 Survey held at Holyhead Date: First Survey 15/8/41 Last Survey 16/9/1941  
82396 (No. of Visits 7)  
 on the Refrigerating Machinery and Appliances of the S.S. "ROTHER" Tons { Gross 986 Net 403  
 Vessel built at Pt Glasgow By whom built Glyde S.B. Eng. Ltd Yard No. ✓ When built 1914-5  
 Owners London Midland Scottish Ry (Associated Hunter Lines) Port belonging to Goole Voyage ✓  
 Refrigerating Machinery made by Liverpool Refrigerating Co Machine Nos. 1166 When made 1914  
additional insulation, cork insulation Co. Insulation fitted by ✓ When fitted 1914 System of Refrigeration carb anhyd  
 Method of cooling Cargo Chambers Brine Insulating Material used Gran & slab cork.  
 Number of Cargo Chambers insulated Two Total refrigerated cargo capacity 35,227 cubic feet.

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Starboard side in E.R.

Refrigerating Units, No. of 1. No. of machines 1 - single Is each machine independent ✓  
 Total refrigeration or ice-melting capacity in tons per 24 hours ✓ Are all the units connected to all the refrigerated chambers yes  
 Compressors, driven direct or through simple reduction gearing. Compressors, single or double acting D.A. If multiple effect compression ✓  
 are relief valves or safety discs fitted ✓ No. of cylinders to each unit 1 Diameter of cylinders 3 1/4"  
 Diameter of piston rod 1 3/4" Length of stroke 12 1/2" No. of revolutions per minute 240 max.  
 Motive Power supplied from auxiliary steam line connected to both boilers (2 Boilers)  
 (State number of boilers, oil engines or electric generators supplying the motive power.)  
 Steam Engines, high pressure, simple or triple expansion, surface condensing. No. of cylinders 1 Diameter 12 1/4"  
 Length of stroke 12 1/2" Working pressure 120 lbs / 10" Diameter of crank shaft journals and pins 3 3/4"  
 Breadth and thickness of crank webs 4 1/2" x 2 1/8" No. of sections in crank shaft one Revolutions of engines per minute 120  
 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 ✓ No. of ✓ Rated ✓ Kilowatts ✓  
 Volts at ✓ revolutions per minute. Diameter of motor shafts at bearings ✓  
 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 1 Cast iron or steel casings Cast iron Cylindrical or rectangular rectangular Are safety valves fitted all together  
 to casings ✓ No. of coils in each 3 Material of coils Steel Can each coil be readily shut off or disconnected ✓  
 Water Circulating Pumps, No. and size of one 6 1/32" x 6 how worked from crank shaft Oil Gas Separators, No. of 1  
 Gas Evaporators, No. of 1 Cast iron or steel casings Cast iron Pressure or gravity type pressure If pressure type, are safety valves fitted ✓  
 No. of coils in each casing 3 Material of coils Steel Can each coil be readily shut off or disconnected ✓  
 Direct Expansion or Brine Cooled Batteries, No. of none 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 ✓ each of ✓ cubic feet capacity, at ✓ revolutions per minute ✓  
 Steam or electrically driven ✓ Where spare fans are supplied are these fitted in position ready for coupling up ✓  
 Brine Circulating Pumps, No. and size of, including the additional pump one - 5 1/4" x 4 3/4" x 6 how worked steam  
 Brine Cooling System, closed or open open Are the pipes and tanks galvanised on the inside no  
 No. of brine sections in each chamber Two  
 Can each section be readily shut off or disconnected yes Are the control valves situated in an easily accessible position yes



Are thermometers fitted to the outflow and to each return brine pipe yes Where the tanks are closed are they ventilated as per Rule yes  
 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 main condenser (or also on plate) *spare standby brine pump to be fitted (see Nottingham letter H. dated 3-9-41)*

**HYDRAULIC AND OTHER TESTS.**

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED)		✓				
GAS COMPRESSORS		✓				
SEPARATORS		✓				
MULTIPLE EFFECT RECEIVERS		✓				
CONDENSER COILS	3-9-41	✓	2500 lbs/10'	✓	✓	✓
EVAPORATOR COILS	3-9-41	✓	2500 lbs/10'	✓	✓	✓
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	21-6-41	20	50	✓	✓	Satisfactory including additional piping

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 14-9-41. Density of Brine 49 by S. Addele 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 -1 & 2  
 atmosphere 66° cooling water inlet and discharge 59 & 64 gas in condensers 78 and evaporators -12  
 the average temperature of the refrigerated chambers N<sup>o</sup> 2 hold 8.75 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 N<sup>o</sup> 2 hold 17.35 N<sup>o</sup> 3 hold 17.35

**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 (except spare brine pump) *(see Nottingham letter H. dated 3-9-41)*  
**Additional Spare Gear Supplied:**  
 2 lengths 4ft covered hose  
 2 lengths 8ft  
 1 Blow lamp  
 2 hatch grid cock.

The foregoing is a correct description of the Refrigerating Machinery.

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)	✓	1 3/4" TRG	Green Cork	6 3/4"						
FRAME NO. N <sup>o</sup> 2 Hold	✓	1 3/4" TRG	Green Cork	6 3/4"						
FRAME NO. N <sup>o</sup> 3 Hold	✓	2" TRG	Green Cork	6 1/2"						
FRAME NO.	✓	2" TRG	Green Cork	6 1/4"						
FRAME NO.										
FRAME NO.										
FRAME NO. (Boiler Room)										
FRAME NO. (Engine Room)										
FRAME NO.										
FRAME NO.										
FRAME NO.										
FRAME NO.										
FRAME NO. (After Peak)										
SIDES	✓	2" TRG	Green Cork	6 1/2" to 7 1/2"	✓					Paint Reserved
OVERHEADING	✓	1 3/4" TRG	Green Cork	6"	✓					
FLOORS OF CHAMBERS	✓	1 1/2" (4" in way of Hatches)	Slab cork	4"	2 1/2"					(Slab cork & outer lining additional)
TRUNK HATCHWAYS										
THRUST RECESS, SIDES AND TOP										6 1/2" cork, 1 1/2" wood lining
TUNNEL SIDES AND TOP										2 1/2" wood, additional 4" slab cork with 1 1/2" wood lining
TUNNEL RECESS, FRONT AND TOP										6 1/2" cork, 1 1/2" wood lining
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 2" Green Cork 1" lining top MANHOLE
HATCHWAY COAMINGS, MAIN										BILGE 2 1/2" wood, 4" slab cork, 1/2" outer lining TRG.
HOLD PILLARS										covered with Rope
MASTS										VENTILATORS 5" cork 9 1/2" lining
Are insulated plugs fitted to provide easy access to bilge suction roses										yes tank, air, and sounding pipes to heels of pillars to
and manhole doors of tanks										yes Are insulated plugs fitted to ventilators yes cargo ports and side lights
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected										yes if so, how 2" additional wood lining
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										3'-2" x 2'-1 1/2" alternate floor fore tunnel top 3'-2" - 24 spacing
fixed or portable										fixed Are screens fitted over the brine grids at chamber sides yes hinged or permanently fixed clips
Thermometer Tubes, No. and position in each chamber										N <sup>o</sup> 2 hold - one in each corner N <sup>o</sup> 3 hold ditto
diameter										2 1/2" mt/Dia 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										Drain to bilges
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** *2 belgs & one tank sounding at bulkhead*

Diameter *Are all sounding pipes in way of insulated chambers fitted in accordance with Section 3, Clause 11* *Yes*  
 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 *✓*  
 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** *1 15/16* Minimum thickness *15/32* Are they galvanised externally *Yes (except hatch grids)*  
 How are they arranged in the chambers *Two circuits, grids on Roof, 5 pipes on each bulkhead, 5 pipes on ship's side & portable hatch grids*

**Thawing Off,** what provision is made for removing the snow from the cooling pipes in the chambers *Steam coil in boiler tank*  
*Blow lamp for thawing hatch cocks*

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

Builders.

**Plans.** Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery *✓* and Insulation *✓*  
 (If not, state date of approval)  
 Is the Refrigerating Machinery and Appliances duplicate of a previous case *✓* 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 *spare boiler pump requires to be fitted at the first opportunity. The Owners superintendent stated that a new boiler pump had already been ordered & arrangements would be made to have same fitted at the first opportunity.*

**General Remarks** (State quality of workmanship, opinions as to class, &c.) *The Refrigerating machinery & appliances of this vessel have not been built under special survey, but the machinery including compressor & valves, steam cylinder, crank shaft, circulating & boiler pumps have now been opened up & examined. The condenser & evaporator opened out, cleaned, coils examined & hydraulically tested to 2250 lbs/10". The insulation drilled & thickness ascertained, tested for fullness & dryness. The steam pipes & connections, Refrigerating liquid pipes, separators, boiler pipes, tanks & connections examined externally as far as possible. additional insulation on tank tops & stowage now fitted including new hatch plugs & coverings, belg lumber plugs & coverings additional boiler pipes to ship's sides, bulkheads & portable hatch grids (additional piping by means J.D. Hall (r)) Boiler pipes & hatch grids tested to 50 lbs/10" after erection (Nos 2 & 3 holds only insulated) The insulation examined under working conditions & satisfactory cooling down test carried out. In our opinion the Refrigerating machinery & appliances of this vessel are eligible to be classed with notation of LLOYD'S R.M.C. 9/41 For War Emergency Service subject to a spare boiler pump being fitted at first opportunity*

**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. Cubic ft.
one	one	carb air	Liverpool Refrigerating Co	1914	Brier Gran flat coil	7 3/4	✓	2	35227

Fee R.M.C. £ 6 : 0 : 0 Fee applied for, *19 SEP 1941*  
 Travelling Expenses £ 8 : 14 : 2 (Received by me, 19)

*W.H. Waggott* *C. Reed*  
 Surveyor to Lloyd's Register.

Committee's Minute *LIVERPOOL 23 SEP 1941*

Assigned *Lloyds R.M.C. 9.41. Subject. For War Emergency Service.*



*25746*  
 Certificate to be sent to