

## REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

-5 FEB 1936

Date of writing Report 19 When handed in at Local Office 3. 2. 36 Port of GLASGOW  
No. in Reg. Book. Survey held at GLASGOW Date: First Survey 7<sup>th</sup> Nov 1935 Last Survey 29<sup>th</sup> Jan 1936  
38108 (No. of Visits 12)

on the Refrigerating Machinery and Appliances of the FORT AMHERST Tons { Gross 3489  
Net 1946

Vessel built at GLASGOW By whom built BLYTHSWOOD S.B. & L<sup>Y</sup> Yard No. 39 When built 1936-1

Owners FURNESS RED CROSS LINE Port belonging to LONDON Voyage CANADA

Refrigerating Machinery made by Machine No. When made

Insulation fitted by MERSEY INSULATION CO When fitted 1936-1 System of Refrigeration

Method of cooling Cargo Chambers BRINE GRIDS Insulating Material used GRANULATED CORK

Number of Cargo Chambers insulated 3 Total refrigerated cargo capacity 13,000 cubic feet.

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed

Refrigerating Units, No. of Single, double, or triple Cubic feet of air delivered per hour

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

Compressors, driven direct or through single } reduction gearing. Compressors, single or double acting No. of cylinders  
double }

Diameter of cylinders Diameter of piston rod Length of stroke No. of strokes per minute

Motive Power supplied from

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

Electric Motors, type No. of Rated Kilowatts

Volts at revolutions per minute. Diameter of motor shafts at bearings

Reduction Gearing, maximum shaft horse power at 1st pinion Revolutions per minute at full power at 1st pinion

2nd pinion 1st reduction wheel main shaft Pitch circle diameter, 1st pinion 2nd pinion

1st reduction wheel Main wheel Width of face, 1st reduction wheel Main wheel

Distance between centres of pinion and wheel faces and the centre of the adjacent bearings, 1st pinion 2nd pinion

1st reduction wheel Main wheel Flexible pinion shafts, diameter 1st 2nd

Pinion shafts, diameter at bearings, External, 1st 2nd Internal, 1st 2nd

Diameter at bottom of teeth of pinion, 1st 2nd Wheel shafts, diameter at bearings, 1st

Main Diameter at wheel shroud, 1st Main

Gas Condensers, No. of Cast iron or steel casings Cylindrical or rectangular

No. of coils in each Material of coils Can each coil be readily shut off or disconnected

Water Circulating Pumps, No. and size of how worked Gas Separators, No. of

Gas Evaporators, No. of Cast iron or steel casings Pressure or gravity type

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 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 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





**Steam Condensing Plant.** State what provision is made for condensing steam, in terms of Section 4, Clauses 13 and 14 — Connections to  
main and auxiliary condensers and to atmospheric exhaust outlet.

DESCRIPTION.	Date of Test.	Working Pressure.	Hydraulic Test Pressure.	Air Test Pressure.	Stamped.	REMARKS.
ENGINE CYLINDERS (IF TESTED) ... ..						
GAS COMPRESSORS ... ..						
.. SEPARATORS ... ..						
.. CONDENSER COILS ... ..						
.. EVAPORATOR COILS ... ..						
.. CONDENSER HEADERS AND CONNECTIONS						
.. CONDENSER CASINGS ... ..						
.. EVAPORATOR CASINGS ... ..						
NH <sub>3</sub> CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE						
BEIRNE PIPING AFTER ERECTION IN PLACE...	12-12-35	15 lb	90 lb	-	-	-

**Cooling Test.** Has the refrigerating machinery been examined under full working conditions, and found satisfactory *yes*

Dates of test *26-12-35 27-12-35* Density of Brine *47* by *Tinsdale* hydrometer

**Temperatures** (when the cargo chambers are cooled down to the required test temperatures) of air at the snow box and of the return air *-* & *-*,  
or, delivery and return air at direct expansion or brine cooled batteries *-* & *-*, outflow and return brine *-12°* & *-11°*  
atmosphere *48°* cooling water inlet and discharge *38° 834°* & *44° 437°* gas in condensers *46°* and evaporators *-20°*,  
the average temperature of the refrigerated chambers *5°* 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 *12°*

Are the machines in accordance with Section 4, Clause 2 of the Rules yes

Are the working parts of the machines, pumps and motors respectively, interchangeable yes

[illegible]

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

**The foregoing is a correct description of the Refrigerating Machinery.**

### 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.
BULKHEADS.										
FRAME No. (Fore Peak)	A									
FRAME No.	F									
	A									
FRAME No.	F									
	A									
FRAME No.	F									
	A									
FRAME No. (Boiler Room)	F									
	A									
FRAME No. (Engine Room)	A									
FRAME No. 43	<del>X</del>									
	A					none	none	Insulated cork	10"	1" W.P.
FRAME No. 12	F					"	"	"	10"	"
	<del>X</del>									
FRAME No.	F									
	A									
FRAME No. (After Peak)	F									
SIDES ... ..						none	none	Insulated cork	10"	1" W.P.
OVERHEADING ... ..						"	"	"	12"	"
FLOORS OF CHAMBERS ... ..						"	"	"	10"	"
TRUNK HATCHWAYS ... ..						"	"	"	10"	"
THRUST RECESS, SIDES AND TOP ... ..				none						
TUNNEL SIDES AND TOP ... ..				none						
TUNNEL RECESS, FRONT AND TOP ... ..				none						

FRAMES OR REVERSE FRAMES, FACE		5" insulation clear of frames			
BULKHEAD STIFFENERS, TOP	✓	BOTTOM	✓	AND FACE	✓
RIBBAND ON TOP OF DECKS		1½" slab cork + 1½" asphalt.			
SIDE STRINGERS, TOP	none	BOTTOM	none	AND FACE	none
WEB FRAMES, SIDES	none	AND FACE	none		
BRACKETS, TOP	none	BOTTOM	none	AND FACE	none
INSULATED HATCHES, MAIN	none	BILGE	none	MANHOLE	none
HATCHWAY COAMINGS, MAIN	none	BILGE	none		
HOLD PILLARS	none				
MASTS	none	VENTILATORS	6" asbestos cotton + 1" boards.		
Are insulated plugs fitted to provide easy access to bilge suction roses		none	tank, air, and sounding pipes	yes	heels of pillars yes
and manhole doors of tanks		none	Are insulated plugs fitted to ventilators	yes	cargo ports none and side lights none
Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected		none	if so, how	✓	
<b>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.</b> none					

Coal Bunker Bulkheads, and Brine Outflow and Return Pipes passing through coal bunkers. Is the insulation, so far as practicable, fireproof yes

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 Battsens, Dimensions and spacing, sides 2" x 2" 12" entire floors gratings tunnel top yes

fixed or portable portable Are screens fitted over the brine grids at chamber sides yes hinged or permanently fixed hooked on

Thermometer Tubes, No. and position in each chamber 2 in each chamber. 1 forward & 1 aft

diameter 3" external 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. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers 3" trapped cu pipes to bilges Where sluices, scupper pipes, and drain pipes are fitted are means provided for blanking them off yes

What provision is made for draining the refrigerating machinery room machinery in engine 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 yes



**Sounding Pipes, No. and position in each chamber situated below the load water line** *none*

**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** *none*

**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, inside dimensions, main** *none* **and branch** *✓*

**Are they permanently fixed or collapsible, or portable** *✓* **State position in chambers** *✓*

**Where air trunkways pass through watertight bulkheads, are they fitted with watertight doors** *none* **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 1/2" internal* **Are they galvanised externally** *no. painted*

**How are they arranged in the chambers** *under deck, ships side & bulkheads*

**Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers**  
*no provision is made for brine heating.*

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

**BLYTHWOOD SHIPBUILDING CO. LTD.**  
*John W. Stewart* **Builders.**  
*Secretary*

**Plans.** Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery *✓* and Insulation *yes*  
(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*

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

*The workmanship and materials are good.*

*The refrigerating machinery and appliances and the insulation have been satisfactorily fitted in the vessel, tried under working conditions and found good.*

*The installation in our opinion renders the vessel eligible for the notation*  
*+ LLOYD'S R.M.C. 1,36.*

*The approved plan of insulation is forwarded herewith.*

*It is submitted that this vessel is eligible for THE RECORD. + Lloyd's R.M.C. 1-36.*  
*RA 572/36*

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

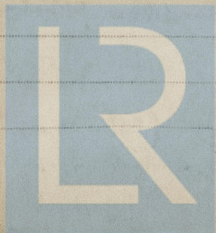
REFRIGERATING MACHINES.					System of (1) Refrigerating (2) Insulating the Chambers.	POWER.		INSULATED CARGO CHAMBERS.	
No. of Units.	No. of Compressors.	System.	Makers.	Date of Construction.		Cubic feet of air delivered per hour.	Ice melting capacity per 24 hours. Tons.	No.	Capacity. Cubic ft.
					<i>Granulated cork</i>			<i>3</i>	<i>13000</i>

*Levy £4*  
**Fee** *£ 6 : 0 : 0* { **Fee applied for,** *28.1. 1936.*  
**Travelling Expenses** *£ :* { **Received by me,** *31.1. 1936.*  
*late fee £1 : 1 : 0 pd 6.3.36*  
**Committee's Minute** *GLASGOW 4-FEB 1936*

*J. Davis, H. Munro*  
**Surveyor to Lloyd's Register.**

**Assigned** *+ Lloyd's R.M.C. 1,36*

**CERTIFICATE WRITTEN.**  
*6.2.36*



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