

## REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office

26 OCT 1942

Date of writing Report 21<sup>ST</sup> OCT 1942 When handed in at Local Office 24<sup>TH</sup> OCT 1942 Port of GREENOCK

No. in

Reg. Book.

Survey held at PORT GLASGOW Date: First Survey 21<sup>ST</sup> JULY 1942 Last Survey 23<sup>RD</sup> OCTOBER 1942

(No. of Visits 21)

on the Refrigerating Machinery and Appliances of the EMPIRE PIBROCH Tons { Gross.....  
Net.....

Vessel built at PORT GLASGOW By whom built LITHGOWS LTD Yard No. 980 When built 1942

Owners MINISTER OF WAR TRANSPORT Port belonging to GREENOCK Voyage ☒

Refrigerating Machinery made by JAE HALL DARTFORD Machine No. 11009 When made 1942

Insulation fitted by MILLER INSULATION CO When fitted 1942 System of Refrigeration NH<sub>3</sub> & AIR

Method of cooling Cargo Chambers AIR CIRCULATION Insulating Material used STILLITE & SLAB CORK

Number of Cargo Chambers insulated FOUR Total refrigerated cargo capacity 229,900 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 <sup>single</sup> } reduction gearing. Compressors, single or double acting \_\_\_\_\_ No. of cylinders \_\_\_\_\_  
<sub>double</sub> }

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

Motive Power supplied from 2 Main and One Auxiliary boilers

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 \_\_\_\_\_

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 \_\_\_\_\_



Where the tanks are closed are they ventilated as per Rule.

**Steam Condensing Plant.** *State what provision is made for condensing steam, in terms of Section 4, Clauses 13 and 14*

Main & Aux Condensers  
See flr 4/11/42

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	16/10/42	185/lbs	250/lbs.		C.N.H.	
BRINE PIPING AFTER ERECTION IN PLACE...	—	—	—	—	—	

Yes.

Dates of test 20<sup>th</sup> to 23<sup>rd</sup> Oct. 1942. Density of Brine — by — 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 <sup>air</sup> ~~air~~ at direct expansion ~~or brine~~ cooled batteries — 6° & 0, outflow and return brine — & —,  
atmosphere 50° cooling water inlet and discharge 53° & 60° gas in condensers 220° and evaporators 7°,  
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 11.8°

ARTICLES REQUIRED BY RULES AND NOT YET SUPPLIED

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

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*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.
BULKHEADS.										
FRAME No. A (Fore Peak)										
FRAME No. 133	A	NONE	3/4" HARD FACED FIBRE BOARD	8"	NONE	NONE	3/4" HARD FACED FIBRE BOARD	STILLITE	8"	NONE.
FRAME No. 96	F	"	"	"	"	"	"	"	"	"
FRAME No.	A									
FRAME No.	F									
FRAME No. (Boiler Room)	A									
FRAME No. 66 (Engine Room)	A	NONE	3/4" HARD FACED FIBRE BOARD	14"	NONE	NONE	3/4" HARD FACED FIBRE BOARD	STILLITE	8"	NONE
FRAME No. 40	F	"	"	14"	"	"	"	"	8"	"
FRAME No.	A									
FRAME No.	F									
FRAME No.	A									
FRAME No. (After Peak)	F									
SIDES	NONE	3/4" H. F. FIBRE BOARD	STILLITE	14"	NONE	NONE	3/4" HARD F. FIBRE BOARD	STILLITE	14	NONE
OVERHEADING	UNDER MAIN DK	ONE @ 1/4" NONE	"	14"	"	"	"	"	11	"
FLOORS OF CHAMBERS	NONE	1" T & G. WOOD	6" SLAB CORK	6"	"					
TRUNK HATCHWAYS						NONE				
THRUST RECESS, SIDES AND TOP						NONE	3/8" STEEL PLATE	STILLITE	8"	NONE
TUNNEL SIDES AND TOP						"	"	"	8"	"
TUNNEL RECESS, FRONT AND TOP						✓				

FRAMES OR REVERSE FRAMES, FACE UNDER INSULATION. (12" FRAMES)

BULKHEAD STIFFENERS, TOP UNDER INSULATION. BOTTOM UNDER INSULATION. AND FACE UNDER INSULATION.

RIBBAND ON TOP OF DECKS 4x3 BOLTED TO 2<sup>ND</sup> DK ALSO FLAT BAR WELDED TO DECK

SIDE STRINGERS, TOP ✓ BOTTOM ✓ AND FACE ✓

WEB FRAMES, SIDES ✓ AND FACE ✓

BRACKETS, TOP ✓ BOTTOM ✓ AND FACE ✓

INSULATED HATCHES, MAIN 6" SLAB CORK. BILGE 6" SLAB CORK MANHOLE 4" SLAB CORK.

HATCHWAY COAMINGS, MAIN 6 1/2" P.P. 17" DEEP BILGE 5x8 1/2" P.P.

HOLD PILLARS NONE

MASTS ✓ VENTILATORS ✓

Are insulated plugs fitted to provide easy access to bilge suction roses. YES tank, air, and sounding pipes YES heels of pillars ✓

and manhole doors of tanks. YES. Are insulated plugs fitted to ventilators. NONE cargo ports ✓ and side lights ✓

Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected NOT YES if so, how TO BE CARRIED OUT ABROAD

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. 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 Battens, Dimensions and spacing, sides 2x2 VERTICAL 18" APART floors TO BE CARRIED OUT ABROAD tunnel top 3x3 BATTENS 18" APART.

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 6 IN NO 4 HOLD. 8 IN NO 2 HOLD 4 " " TWINDKS. 4 " " TWINDKS

diameter 2 1/2" INSIDE 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. Where the chambers are situated below the load water line, what provision is made for draining the inside of the chambers

4" SCUPPERS TO BILGE FITTED WITH N.R. VALVES 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 SCUPPERS TO BILGE.

brine return room SCUPPERS TO BILGE fan room SCUPPER TO BILGE 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 ONE P45 IN N°2 HOLD.

Diameter 3" 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 (TANK TOP ONLY). 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 ONLY FITTED ON TANK TOP.

Air Trunkways in Chambers, inside dimensions, main N°2 HOLD - SEMI-CIRCULAR 22" RAD<sup>s</sup> and branch AS PER PLAN.

Are they permanently fixed or collapsible, or portable PORTABLE State position in chambers ON TANK TOP & UNDER DECK

Where air trunkways pass through watertight bulkheads, are they fitted with watertight doors NONE FITTED Are the door frames efficiently insulated ✓

Are insulated plugs supplied for the doorways ✓ Where are the doors worked from ✓

Cooling Pipes in Chambers, diameter ✓ 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.

For **LITHGOWS LIMITED** Builders.

Plans. Are approved Plans or Specifications forwarded herewith for the Refrigerating Machinery No see previous vessels PLAN APPROVED 14-3-42.

Is the Refrigerating Machinery and Appliances duplicate of a previous case yes If so, state name of vessel Empire Galahad & Empire Buxton

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

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

The refrigerating machinery & appliances have been efficiently installed in the vessel, & tried out under full working conditions with satisfactory results. The materials & workmanship are good.

This installation is eligible, in our opinion, to be classed in the Society's Register book with record.

+ LLOYDS R.M.C 10.42 (IN RED) as recommended in London R.M.C report No. 1298.

PARTICULARS TO BE ENTERED IN REGISTER BOOK.

REFRIGERATING MACHINES.					POWER.		INSULATED CARGO CHAMBERS.	
No. and whether Single or Duplex.	Makers.	Date of Construction.	System.	Type.	(1) Refrigerating (2) Insulating the Chambers.	Cubic feet of air delivered per hour.	No.	Capacity.
2 Units 4 Compressors	J & E HALL LTD	1942	AMMONIA		(1) AIRTY DRIET INSULATED (2) STILL TENS LAB CORK	72	4	229,900

INSULATION Fee £ 7 : 0 0 Fee applied for, 26<sup>th</sup> OCT 1942. Travelling Expenses £ : : Received by me, 19

Committee's Minute

Assigned

FRI. 30 OCT 1942

+ Lloyd's Rmc 10.42

Worick Ink

HK

Kennedy Ingham & M. Caldwell. Surveyors to Lloyd's Register. Lloyd's Register Foundation