

## REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office)

Date of writing Report 10 NOV 1943

When handed in at Local Office 10 NOV 1943

Port of Newcastle

15 NOV 1943

No. in

Reg. Book.

34352 (sup).

Survey held at Newcastle.

Date: First Survey 10-6-43

Last Survey 5-10-

1942

(No. of Visits) 5

on the Refrigerating Machinery and Appliances of the

"EMPIRE FLAG" new tonnage

Gross 4024.48

Net 2733.63

Vessel built at

Newcastle.

By whom built

Sir W. G. Armstrong Whitworth &amp; Co. (Shipbuilders) Ltd.

Yard No.

H

When built

1943.

Owners

Ministry of War Transport

Port belonging to

Newcastle

Voyage

Refrigerating Machinery made by

L. Steen &amp; Co.

Machine Nos. 2468 &amp; 9

When made

1943

Insulation fitted by

Cork Insulation Co. Ltd.

When fitted

10-1943

System of Refrigeration NH3

Method of cooling Cargo Chambers

Air

Insulating Material used

Slab cork &amp; slag wool

Number of Cargo Chambers insulated

3.

Total refrigerated cargo capacity

284000.

cubic feet.

## DESCRIPTION OF REFRIGERATING MACHINERY. Where placed

Refrigerating Units, No. of

No. of machines

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

Compressors, driven direct or through

single  
double

reduction gearing.

Compressors, single or double acting

If multiple effect compression

Are relief valves or safety discs fitted

No. of cylinders to each unit

Diameter of cylinders

Diameter of piston rod

Length of stroke

No. of revolutions per minute

Motive Power supplied from

3 Boilers

(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

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

Cast iron or steel casings

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 pumps available

2

how worked

1 motor driven centrifugal C.E. pump

Gas Separators, No. of

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

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

6

each of 14500

cubic feet capacity, at 110 r.p.m. revolutions per minute

Steam or electrically driven

Electrically

Where spare fans are supplied are these fitted in position ready for coupling up

No.

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

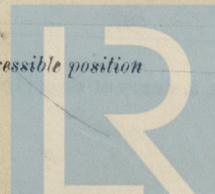
No. of brine sections in each chamber

Can each section be readily shut off or disconnected

Are the control valves situated in an easily accessible position

NOTE: THE WORDS WHICH DO NOT APPLY SHOULD BE DELETED.

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Are thermometers fitted to the outlet 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 ☒ *Yes.*

### 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 ...						
.. EVAPORATOR COILS ...						
.. CONDENSER HEADERS AND CONNECTIONS						
.. CONDENSER CASINGS ...						
.. EVAPORATOR CASINGS ...						
NH <sub>3</sub> CONDENSER, EVAPORATOR AND AIR COOLER COILS AFTER ERECTION IN PLACE	5.10.43	✓	None	200	✓	
BRINE PIPING AFTER ERECTION IN PLACE...	✓	✓	✓	✓	✓	

Have important steel castings and forgings been tested in accordance with the Rules ☒

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

Dates of test 26, 27, 28/10/43 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.

*X* 5° & 8° , outflow and return brine ☒ & ☒  
atm. sphere 50° cooling water inlet and discharge 52° & 55° gas in condensers 51° and evaporators 4°  
the average temperature of the refrigerated chambers 5° and the rise of temperature in these chambers upon the expiration of 14 hours  
time after the machinery and cooling appliances have been shut off 11.8°

### SPARE GEAR.

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

Has the spare gear required by the Rules been supplied ☒

**Additional Spare Gear Supplied:** ☒

The foregoing is a correct description of the Refrigerating Machinery.

Per *PROCTER & CO. LTD.*

*[Signature]*



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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. 133	F									
	A		Slag wool	8"	↑			Slag wool	8"	↑
FRAME No. 109	F							do	3"	
	A		Slag wool	14"				do	7"	
FRAME No. 84	F		Slag wool	10"				do	10"	
	A									
FRAME No. (Boiler Room)	F				1/2" Soft.					1/2" Soft.
	A				wood					wood
FRAME No. 58 (Engine Room)	A		Slag wool	14"	with			Slag wool	10"	with
	F		do	8"	3/16" Hard			do	8"	3/16" Hard
FRAME No. 34	A				wood					wood
	F				plating					plating
FRAME No.	A									
	F									
FRAME No.	A									
	F									
FRAME No. (After Peak)	F									
SIDES			Slag wool	14"				Slag wool	14"	
OVERHEADING								do	10 1/2"	
FLOORS OF CHAMBERS			Cork slabs	2 @ 3"	1 1/2" W.W.					
TRUNK HATCHWAYS										
THRUST RECESS, SIDES AND TOP								Slag wool	8"	
TUNNEL SIDES AND TOP								do	8"	
TUNNEL RECESS, FRONT AND TOP										

FRAMES OR REVERSE FRAMES, FACE 2"

BULKHEAD STIFFENERS, TOP BOTTOM AND FACE 2"

RIBBAND ON TOP OF DECKS

SIDE STRINGERS, TOP BOTTOM AND FACE

WEB FRAMES, SIDES AND FACE

BRACKETS, TOP BOTTOM AND FACE

INSULATED HATCHES, MAIN 1 1/2" W.W. - 6" Plt. with 1 1/2" W.W. 8 1/2" BILGE 1 1/2" W.W. - 3" Plt. with 1 1/2" W.W. 6 1/2" MANHOLE 1 1/2" W.W. - 3" Plt. with 1 1/2" W.W. 6 1/2"

HATCHWAY COAMINGS, MAIN 2" P.P. lining with 1/2" G.I. plating BILGE 2" P.P. lining with 1/2" G.I. plating

HOLD PILLARS

MASTS 8" Slag wool & 2" soft board with 1/2" Hard wood plating

Are insulated plugs fitted to provide easy access to bilge suction roses Yes tank, air, and sounding pipes Portable lining heels of pillars Rupture lining

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 Only if so, how 3/4" Blue plating

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 2" x 2" @ 15 1/2" floors tunnel top 3" x 3" @ 15" 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 - 3 feet & 3 inches diameter 2 1/2" internal 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 4" Brine trapped scuppers (10 x 15) Yes

Where drains, 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 Trapped scuppers to Eng Room Bilge with overflow cock

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

