

REPORT ON REFRIGERATING MACHINERY AND APPLIANCES.

(Received at London Office - 3 OCT 1941)

Date of writing Report 19 When handed in at Local Office Port of London
No. in Reg. Book. Survey held at London Date: First Survey 14th Oct. 1939 Last Survey 13th March 1941
(No. of Visits 7)

on the Refrigerating Machinery and Appliances of the M.V. Empire Pride Tons { Gross
Net

Vessel built at Glasgow By whom built Barclay Curle & Co. Ltd. Yard No. 680 When built 1941

Owners Port belonging to Voyage

Refrigerating Machinery made by J. E. Hall Ltd. Machine Nos. 10433 10434 When made 1941

Insulation fitted by When fitted System of Refrigeration CO₂ + Brine

Method of cooling Cargo Chambers Brine grids Insulating Material used

Number of Cargo Chambers insulated 9 Total refrigerated cargo capacity 12,550 cubic feet.

DESCRIPTION OF REFRIGERATING MACHINERY. Where placed Lower Deck, aft main eng. rm.

Refrigerating Units, No. of 2 No. of machines 2 Is each machine independent yes

Total refrigeration or ice-melting capacity in tons per 24 hours 15 Are all the units connected to all the refrigerated chambers yes

Compressors, driven direct or through ^{single} ~~double~~ reduction gearing. Compressors, single or double acting Single If multiple effect compression

Are relief valves or safety discs fitted yes No. of cylinders to each unit 2 Diameter of cylinders 2 1/8"

Diameter of piston rod 1" Length of stroke 6" No. of revolutions per minute 1400

Motive Power supplied from (State number of boilers, oil engines or electric generators supplying the motive power.) Machines driven by direct coupled electric motors.

Steam Engines, high pressure, compound, or triple expansion, surface condensing. No. of cylinders Diameter

Length of stroke 2 1/2 Working pressure Diameter of crank shaft journals and pins 3" journals, 3 1/2" pins

Breadth and thickness of crank webs CO₂ mach. 5" x 1 3/4" thk No. of sections in crank shaft one Revolutions of engine per minute 1400

Oil Engines, type 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 Enclosed ventilated No. of 2 Rated 33 B.H.P. Kilowatts

Volts at 220 @ 300/400 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 2 (each with 2 casings) Cast iron or steel casings Copper Cylindrical or rectangular cylindrical Are safety valves fitted

to casings yes No. of coils in each casing = 1 Material of coils 1" x 3/4" copper Can each coil be readily shut off or disconnected yes

Water Circulating Pumps, No. and size of pumps available one - 1 1/2" centri. how worked electrically direct Gas Separators, No. of 4

Gas Evaporators, No. of 2 Cast iron or steel casings Steel Pressure or gravity type pressure If pressure type, are safety

valves fitted vent pipe No. of coils in each casing 6 Material of coils 1 1/2" S.P. Steel. Can each coil be readily shut off or disconnected yes.

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 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 2 - 1 1/2" centrifugal how worked electrically direct.

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 in each of the 2 meat rooms, 1 in each of the remaining 7 rooms

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

MADE IN ENGLAND.



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Are thermometers fitted to the ^{Common} 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 *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 | 11-3-41 | 1000 lb. sq. in. | 3000 lb. sq. in. | 1500 lb. sq. in. | 94 | |
| SEPARATORS | 11-3-41 | do. | do. | do. | 94 | |
| MULTIPLE EFFECT RECEIVERS | 4-3-41 | do. | do. | do. | 94 | |
| CONDENSER COILS | 14-10-39 | do. | do. | do. | 94 | |
| EVAPORATOR COILS | 25-2-41 | do. | do. | do. | 94 | |
| CONDENSER HEADERS AND CONNECTIONS | 11-3-41 | do. | do. | do. | 94 | |
| CONDENSER CASINGS | 1-12-39 | 10 to 15 lb. sq. in. | 30 lb. sq. in. | - | 94 | |
| EVAPORATOR CASINGS | 13-3-41 | 20 to 25 lb. sq. in. | 50 lb. sq. in. | - | 94 | |
| NH ₃ 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 *yes*
 Dates of test *11-3-41* Density of Brine *1.020* 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
 atmosphere *10°* cooling water inlet and discharge *45°* & gas in condensers *100°* and evaporators *10°*
 the average temperature of the refrigerated chambers *10°* and the rise of temperature in these chambers upon the expiration of *1* hours
 time after the machinery and cooling appliances have been shut off *1*

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*
Additional Spare Gear Supplied:
 6 lubr. piston leathers, 2 Springs for water relief valve, 2 bolts & nuts for conn. rod big end, 6 do. gland do. 2 do. brine do. do. 2 do. do. crosshead, 1 set of 2 leather moulds 2 do. CO₂ relief valve 2 do. do. main bearings, 1 liner for each machine 1 oil pump for lubr, 1 CO₂ gauge, 1 hydrometer, 6 safety discs, 1-1/2" CO₂ valve with 3 spare pipes, 1 pair main bearings, 1 pair conn. rod big end bearings, 1 pair crosshead bearings, 1 regulator valve & Springs for spring loaded regulator, 1 set ratchet screws, 1 fitted box for compressor parts, 1 spindle & impeller for water and also for brine pumps

ELECTRICAL SPARES.

- | | |
|----------------------------------|--------------------|
| 1 Armature | } machine motor |
| 1/2 set field coils | |
| 1/2 set interpole coils | |
| 1 set of bearings | |
| 1 set of brushes | |
| 1 set of brush holders & Springs | |
| 1 set of Controller spares | |
| | } Water pump motor |
| | } Brine pump motor |
| | } F.W. pump motor |

The foregoing is a correct description of the Refrigerating Machinery.

J. Stoll
 Manufacturer.

DESCRIPTION OF INSULATION. (Ship's Stores.)

| | 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. 40 (Base-Frame) F | ✓ | 1/2 Cement | Slab Cork | 10 1/2" | ✓ | | | | | |
| FRAME NO. 60 (part) F | ✓ | - do. | - do. | - do. | ✓ | | | | | |
| FRAME NO. 68 (part) F | ✓ | - do. | - do. | 10" x 12" | ✓ | | | | | |
| FRAME NO. F | | | | | | | | | | |
| FRAME NO. (Boiler Room) F | | | | | | | | | | |
| FRAME NO. (Engine Room) F | | | | | | | | | | |
| FRAME NO. F | | | | | | | | | | |
| FRAME NO. F | | | | | | | | | | |
| FRAME NO. F | | | | | | | | | | |
| FRAME NO. (After Peak) F | | | | | | | | | | |
| SIDES | ✓ | 1/2 Cement | Slab Cork | 13" port- 14" stabs | ✓ | | | | | |
| OVERHEADING | ✓ | - do. | - do. | 11 1/2 port- 12 1/2 stabs | ✓ | | | | | |
| FLOORS OF CHAMBERS | ✓ | 1 1/2 asphalt | - do. | 9" port- 10 1/2 stabs | ✓ | | | | | |
| TRUNK HATCHWAYS | ✓ | 1 1/2 T+G | - do. | 9" x 10 1/2" | 1/2 Cement | | | | | |
| THRUST RECESS, SIDES AND TOP | ✓ | | | | | | | | | |
| TUNNEL SIDES AND TOP | ✓ | | | | | | | | | |
| TUNNEL RECESS, FRONT AND TOP | ✓ | | | | | | | | | |
| FRAMES OR REVERSE FRAMES, FACE | | <i>Covered as approved</i> | | | | | | | | |
| BULKHEAD STIFFENERS, TOP | | | | | | | | | | |
| BULKHEAD STIFFENERS, BOTTOM | ✓ | | | | | | | | | |
| RIBBAND ON TOP OF DECK | ✓ | | | | | | | | | |
| SIDE STRINGERS, TOP | ✓ | | | | | | | | | |
| SIDE STRINGERS, BOTTOM | ✓ | | | | | | | | | |
| WEB FRAMES, SIDES | ✓ | | | | | | | | | |
| BRACKETS, TOP | ✓ | | | | | | | | | |
| INSULATED HATCHES, MAIN | ✓ | | | | | | | | | |
| HATCHWAY COAMINGS, MAIN | ✓ | | | | | | | | | |
| HOLD PILLARS (Tween Deck) | | <i>Slab Cork with Galvanized Iron Sheeting.</i> | | | | | | | | |
| MASTS | ✓ | | | | | | | | | |
| VENTILATORS | ✓ | | | | | | | | | |
| Are insulated plugs fitted to provide easy access to bilge suction roses | ✓ | | | | | | | | | |
| Are insulated plugs fitted to ventilators | ✓ | | | | | | | | | |
| Are screens fitted over the brine grids at chamber sides | ✓ | | | | | | | | | |
| Is the insulation of the lower hold floor and tunnel top in way of the hatchways protected | ✓ | | | | | | | | | |
| 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 | 4 1/2" x 7/8" | 4" apart | | | | | | | | |
| Are screens fitted over the brine grids at chamber sides | 3" x 3/4" | 1" apart | | | | | | | | |
| Thermometer Tubes, No. and position in each chamber | 1 in each chamber at side near each doorway. | | | | | | | | | |
| diameter | 2 1/2" | | | | | | | | | |
| 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 | 2 1/2" suction | | | | | | | | | |
| 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 | 2 1/2" suction | | | | | | | | | |
| 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 ✓ Yes Are cement facings reinforced with expanded steel lattice ✓ Yes

How is the expanded metal secured in place ✓ fixed to Grouds.

How are the cork slabs secured to the steel structure of the vessel ✓ fixed to Grouds + bedded in "Bitulac".

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 2" Minimum thickness ✓ Are they galvanised externally ✓ Yes
 How are they arranged in the chambers ✓ In meat rooms ✓ Fish rooms + Ice rooms ✓ Sides + overheads. ✓
 In other " " ✓ Sides only.

Thawing Off, what provision is made for removing the snow from the cooling pipes in the chambers ✓ Hot Brine.

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

J.D. Insulation Company Ltd R.R. 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

General Remarks (State quality of workmanship, opinions as to class, &c.) *The refrigerating machinery was constructed under special survey and the materials and workmanship are good and it will be eligible for the notation + Lloyds R.M.C. (with date) when the installation and testing have been satisfactorily completed.*

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. | | | | Tons. | No. |
| 2 | 2 | Cash. Aubrey | J. E. Hall Ltd. | 1941 | (1) Brine | 15 | ✓ | 10 | 22,500 |

Fee *Low at £2* £ 6 : 0 : 0 } Fee applied for, 19
 Travelling Expenses £ : : } Received by me, 19

D. Gemmell
 Surveyor to Lloyd's Register.

Committee's Minute GLASGOW 1 OCT 1941
 Assigned SEE ACCOMPANYING MACHINERY REPORT.

Certificate to be sent to

