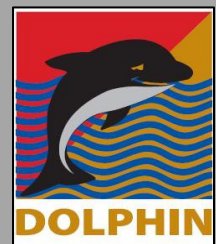


**PIONEER IN
HEAT TRANSFER
TECHNOLOGY**

**DOLPHIN SHELL & TUBE
MARINE CONDENSERS (DSTMC)**



Dolphin Shell & Tube Marine Condenser (DSTMC)

General Information

Dolphin carries out Thermal Design, Mechanical Design & detailed fabrication drawings of marine condenser as per ASME Sec.VIII Div.I with TEMA & ASME 'U' stamp. We have Thermal design software & Mechanical design software, which carry out complex design for various operating conditions and come up with most optimum solutions. We are able to design & manufacture the marine condenser according to Customer's specific thermal, mechanical and dimensional requirements & supplied with full certification as per TEMA (Class R, C, and B) ASME Sec. VIII Div.1, BS, DIN Standards.

Dolphin designs and manufactures its products to the highest standards to ensure a long operational lifetime and durability. If required, the products can be quality-assured by main certification societies. Dolphin provides a complete after sales service from supply of spare parts to inspection, maintenance and repair.

Dolphin offers cleanable Shell & Tube Integrally Finned Water Cooled Condensers from 3 TR to 500 TR capacity. These Condensers are built in a wide variety of sizes from 6 inch to 24 inch in diameter. Lengths vary from 1.5 feet to 20 feet over the tube heads. Our condensers are designed for a pressure of 24_(g) bar gauge on shell side and 10_(g) bar gauge on tube side.

They are tested upto 30_(g) bar gauge on the shell side & 13_(g) bar gauge on tube side. The Condensers are fabricated as per TEMA / ASME unfired pressure vessels codes. Condensers for sea water marine application or with steels shells are also offered & designed as per customer specific requirements.

By using the latest design philosophy and special materials, Dolphin has produced the new series of marine condenser with following:

- End covers with large internal water volume.
- Possibility of tubes removing.
- Protection against electrolytic corrosion.
- Easy of access for inspection and replacement of anodes.
- Innovative internal coating of end covers.
- Compact design.

Technical Information

➤ Dolphin's Shell & tube marine condenser (DSTMC) is very efficient and compact. This ruggedly constructed shell and tube marine condenser is based on high efficiency tubes which offer superior performance in a more compact size.

➤ The main applications of the marine condenser series are condensing refrigerant gas in air conditioning packages and refrigeration plants using sea water as medium.

➤ Many refrigerants can be applied such as R-22, R-134a & R-407c and other refrigerants compatible with construction materials and according to national laws and regulations.

➤ All the condensers are provided with safety valve connection, spare/vent connection to the shell. For air purge and water drains have to be used anodes connection ports.

- According to condensers models, refrigerant connections are supplied with welding & brazing connections.
- Flanged connections are also available on request.
- All connection and dimensional data shown in this catalogue are to be intended as an instruction for customer's consideration. We reserve the right to get any change without prior notice.

Material Used

Standard type construction of new marine condenser comprises:

Shell : Carbon steel

Tube : Cu/Ni 90/10 alloy & Low fin Al. Br

Tubesheet : Carbon steel with protective sea water resistant coating & Naval Brass

End cover : Carbon steel with protective sea water resistant coating / Bronze Casting

Ring : Styrene Butadiene Rubber (SBR)

Alternative materials are available within our production facilities and can be supplied on request. Other condensers with higher capacity and different number of passes can be also manufactured.

Material Description

Shells: Steel pipe to ASME specification. Shells are sand blasted and cleaned prior to assembly.

Tubes: Cu/Ni 90/10 alloy & Low fin Al.Br high performance enhanced design, roller expanded into multiple-grooved tube sheet.

Tubesheet: Naval brass to ASME specifications. Precision machined for excellent sealing.

Tube Supports: Quality steel made to close tolerance to minimize vibrations.

Heads: Cast Bronze or other Equivalent materials to withstand the corrosive effects of sea water duty.

Connections: Connections will be as per original unit or to be advised by the Customer.

Codes: The refrigerant side is constructed to the latest edition of the ASME section VIII Div.1

Features and Benefits

1. Compact: The DSTMC is more compact because the condenser uses high efficiency low fin tubes, which provide 30% to 40% more heat transfer efficiency than conventional plain tubes. This makes the DSTMC smaller than older shell and tube designs, yet with the same or better performance.

2. Marine Applications: The DSTMC is designed for fishing boat refrigeration, tankers, cruise ships and offshore drilling applications.

3. OEM and Replacement: The DSTMC is ideal for custom refrigeration packages and condenser replacement situations. Because the DSTMC is more compact than older designs, it takes up less space, thus making the DSTMC a service engineer's choice for field replacements.

4. Rugged Construction: Unlike other designs, the DSTMC uses 90/10 cupronickel & Low fin Al.Br tubes & Naval Brass tubesheet. The appropriate materials for long life and rugged use in sea water environments. All models are ASME construction sec VIII, Division 1, 'U' Stamped as required. All tubes are expansion rolled into double grooved tube sheets. All DSTMC have single gas inlet, two liquid outlets. Every unit is factory tested prior to dispatch.

Advice for a correct selection

The fouling factor (f.f) of sea water is essential for correct selection of condensers

$$f.f = 0.0005 \text{ hr-ft}^2\text{-}^\circ\text{F}/\text{BTU} \text{ (up to } 125^\circ\text{F)} \text{ \& } 0.001 \text{ hr-ft}^2\text{-}^\circ\text{F}/\text{BTU} \text{ (over } 125^\circ\text{F)}$$

Dolphin recommended to limit water tube side velocity between 1.0 -2.2 m/s depends upon the tube material.

Advantages

- High heat rejection and efficient fluid dynamic performances
- Mechanically cleanable
- Maximum corrosion resistance in severe environments conditions
- Dimensional adaptability and flexibility
- A very wide variety of sizes available
- Compact size
- Cost effectiveness
- Short manufacturing and delivery times.

Our capabilities

- New Design and Manufacture
- Replacement
- Re-tubing
- High Pressure Washing
- Chemical Cleaning
- Replacement Parts, Gaskets and Seals.

Inspection and Test

Each stage of manufacturing is subjected to rigorous inspection and test scrutiny – from incoming material to complete assembly. An authorized inspector oversees the complete manufacturing operation. Our in-house quality team ensures that the proper procedures are in-place, that our employees are well trained, and that all the required inspections occur at the critical stages of assembly. Dolphin is well versed in all major pressure vessel codes, invests regularly in maintaining our various code certifications and can offer a wide range of testing typical within the shell & tube industry.

Design Concept

When designing the Marine condenser we consider the following parameters:

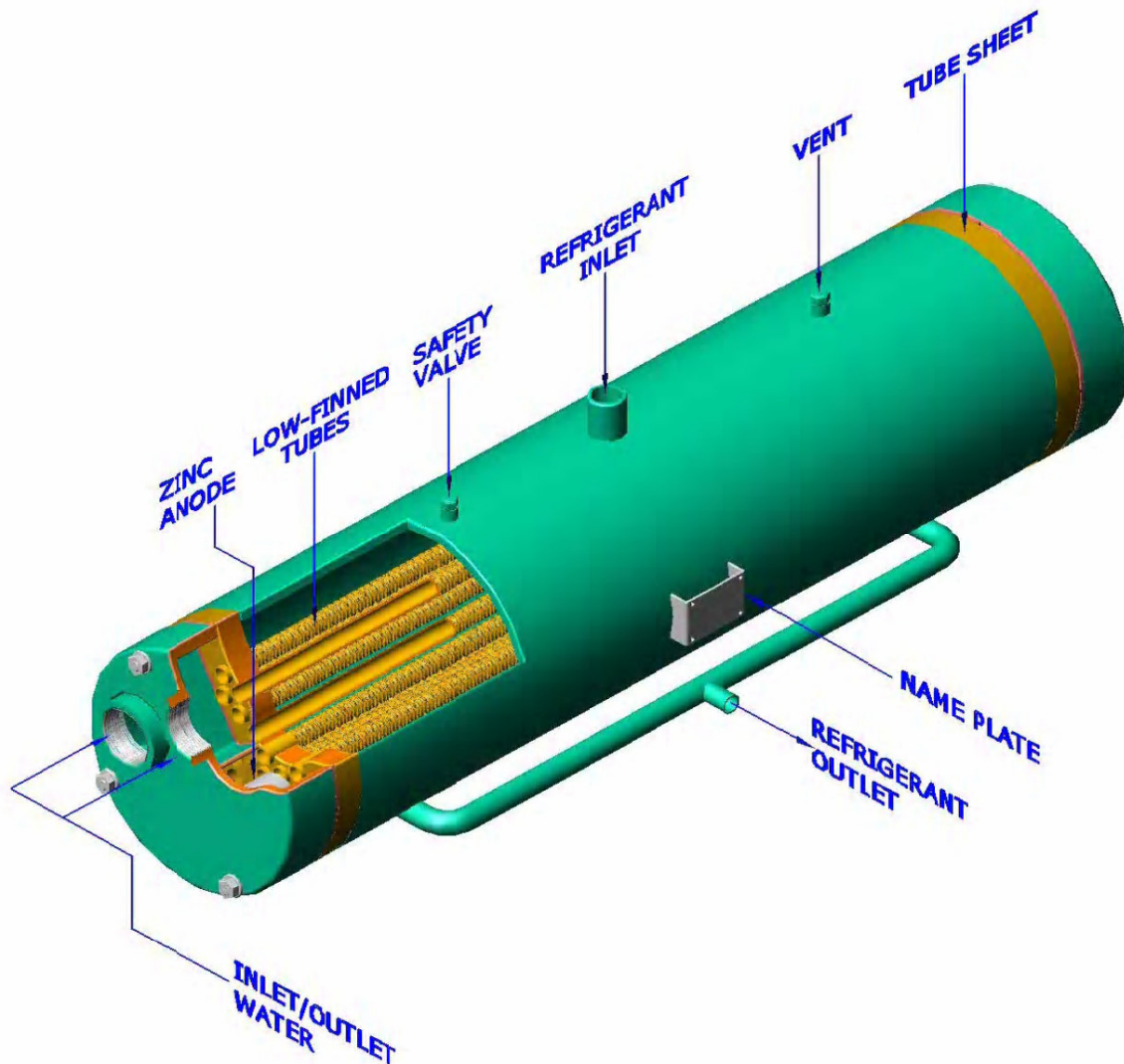
Refrigerant : R-22

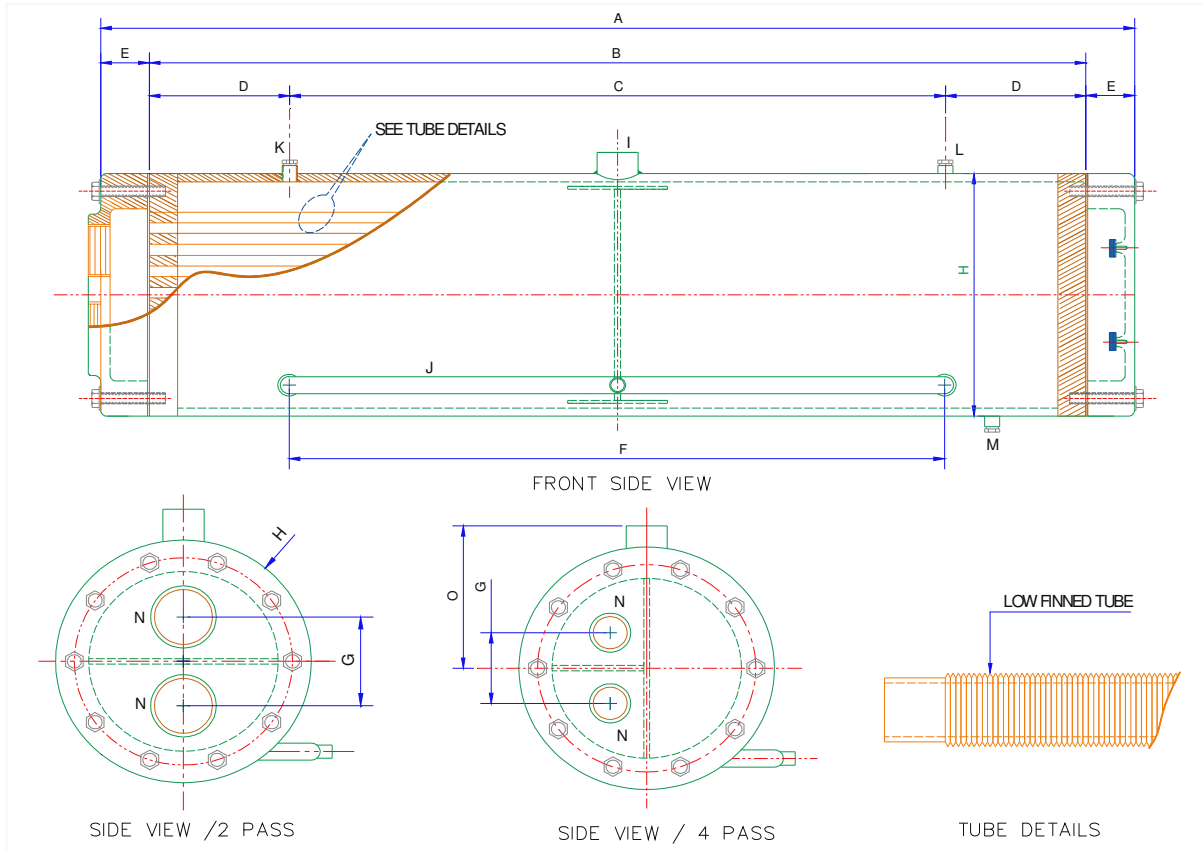
Sea water Temp in : 32 °C

Sea water Temp out : 37 °C

Condensing Temp : 45 °C

We are able to design the marine condenser with other Refrigerants with different condensing temperature & availability of your cooling temperatures.





MODEL	TR	A	B	C	D	E	F	G	H	I NPT	J NPT	K NPT	L&M NPT	N NPT	O
DSTMC-5	5	984	880	580	150	52	580	50	168.30	3/4"	1/2"	1/2"	1/2"	1"	160
DSTMC-10	10	1014	910	610	150	52	610	80	219.10	1"	1/2"	1/2"	1/2"	1 1/2"	160
DSTMC-15	15	1114	1010	710	150	52	710	100	219.10	1 1/2"	3/4"	1/2"	1/2"	2"	160
DSTMC-20	20	1104	1000	700	150	52	700	100	273.00	1 1/2"	1"	1/2"	1/2"	2"	160
DSTMC-25	25	1154	1050	750	150	52	750	100	273.00	1 1/2"	1"	1/2"	1/2"	2 1/2"	160
DSTMC-30	30	1484	1380	980	200	52	980	100	273.00	2"	1"	1/2"	1/2"	2 1/2"	160
DSTMC-35	35	1650	1490	1090	200	80	1090	100	273.00	2"	1"	1/2"	1/2"	2 1/2"	185
DSTMC-40	40	1790	1630	1230	200	80	1230	100	273.00	2"	1 1/2"	1/2"	1/2"	3"	185
DSTMC-45	45	1940	1780	1380	200	80	1380	100	273.00	2"	1 1/2"	1/2"	1/2"	3"	185
DSTMC-50	50	1690	1450	1000	225	120	1000	150	323.80	2 1/2"	1 1/2"	1/2"	1/2"	3"	230
DSTMC-55	55	1810	1570	1120	225	120	1120	150	323.80	2 1/2"	1 1/2"	1/2"	1/2"	3"	230
DSTMC-60	60	1800	1560	1110	225	120	1110	150	323.80	2 1/2"	1 1/2"	1/2"	1/2"	3 1/2"	230
DSTMC-65	65	1940	1700	1250	225	120	1250	150	323.80	3"	1 1/2"	3/4"	1/2"	3 1/2"	230
DSTMC-70	70	2070	1830	1380	225	120	1380	150	323.80	3"	1 1/2"	3/4"	1/2"	3 1/2"	230
DSTMC-75	75	2120	1880	1430	225	120	1430	150	323.80	3"	1 1/2"	3/4"	1/2"	4"	240
DSTMC-80	80	1900	1660	1160	250	120	1160	180	355.60	3"	2"	3/4"	1/2"	4"	240
DSTMC-85	85	2010	1770	1270	250	120	1270	180	355.60	3"	2"	1"	1/2"	4"	240
DSTMC-90	90	2140	1900	1400	250	120	1400	180	355.60	3 1/2"	2"	1"	1/2"	4"	240
DSTMC-95	95	2220	1980	1480	250	120	1480	180	355.60	3 1/2"	2"	1"	1/2"	4"	240
DSTMC-100	100	2320	2080	1580	250	120	1580	180	355.60	3 1/2"	2"	1"	1/2"	4"	240

Tube Material: Low fin Al. Br Tubes

All dimensions are in mm, unless otherwise specified.

For alternative capacities & sizes, please contact us.

Drawing description

- A - Total Length
 - B - Tubesheet to Tubesheet Length
 - C - Safety socket to Purge socket Length
 - D - Purge Socket to Tubesheet & Safety socket to tubesheet
 - E - End cover Length
 - F - Common Header distance for shell side outlet
 - G - Tube side socket to socket
 - H - Shell Diameter
 - I - Shell side inlet
 - J - Shell side outlet
 - K - Safety socket
 - L - Purge Socket
 - M - Drain socket
 - N - Tube side Inlet/Outlet Connection
 - O - Socket height from centre.
- End cover is carbon steel make with protective sea water resistant coating or Bronze casting.
 - Zinc anode (sacrificial anode) is to be placed on end cover to protect shell material from corrosion.

ENQUIRY FORM

Please fill in the information below to help us learn more about your applications

Name Project

Company Address

City/State P.O.Box No.....

Zip Country

Mobile Tel

Fax E-mail

Existing unit information

Manufacturer's Name

Model No.

Serial No.

Please provide the Existing size, No. of tubes, tube size, tube thickness, No. of Baffles, Material of construction & detail drawings or original sample.

New marine condenser requirements

Shell Side

Type of Refrigerant

Condenser Capacity TR

Mass flow rate Kg/sec

Condensing temperature °C

Pressure Drop Psi

Tube Side

Flow rate m³/hr

Temp In °C

Temp Out. °C

Design Pressure..... Psi (g)

Pressure Drop Psi

Test Pressure Psi (g)

Remarks