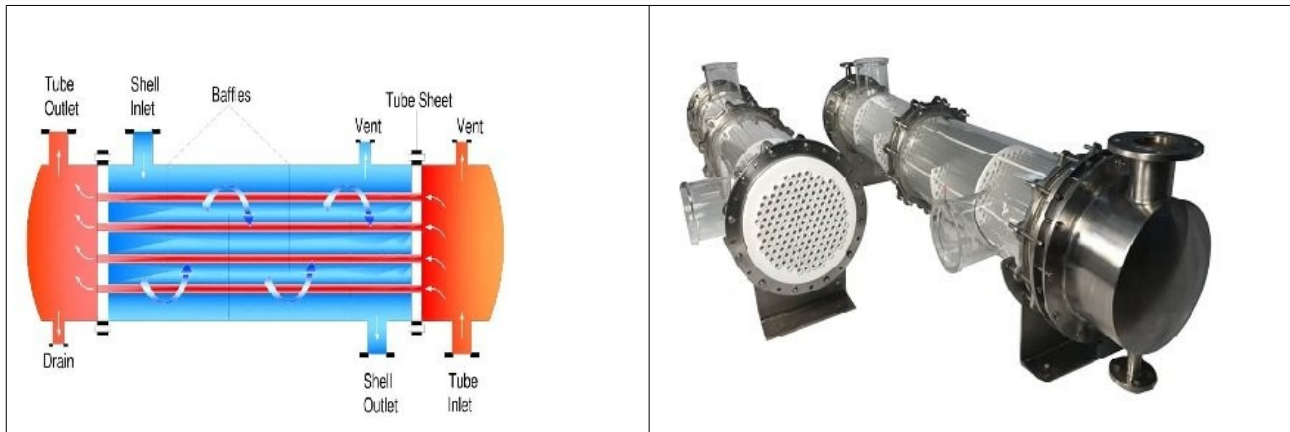


Glass Shell and Tube Heat Exchanger



Introduction

Shell and Tube Heat Exchangers are one of the most common and versatile types of exchangers used in heat transfer applications. They allow transfer of large amounts of heat in a more compact construction than is possible with conventional coil type heat exchangers. Shell and Tube type Heat Exchangers find application as heaters, coolers, condensers, vaporizers, reboilers, etc.

Area: Upto 50 m²

No. Of Pass: Upto 3 Pass

Pertinent Features of Shell Tube Heat Exchanger

- They have colossal Heat Transfer Surfaces.
- They have high Heat Transfer Coefficients.
- The sides of Shell, as well as Tubes, can be made diffusion and corrosion-resistant.
- Their Modular Design helps make the maintenance simple and also makes the reserves part stocking work efficiently.
- They can handle pressure up to +6 bar G.
- They are perfectly suitable for Pharmaceutical GMP applications that manufacture ultra-pure products.
- They are available with a different working capacity of heat transfer areas ranging from 0.3m² to 50m².
- They are highly resistant to corrosion, erosion, and oxidation across the full range of operating temperatures.
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Application

Shell and Tube Heat Exchanger comes with a universal design whose application helps in the smooth working of the heat transfer processes such as

- Condensation
- Heat Transfer
- Cooling
- Reboiler

And they are designed with high endurance and performance measures that help them operate at temperatures ranging between -40 °C to +150 °C, and they can handle the pressure between -1 Bar G to +3.5 Bar G.

Variants

- Translucent reinforced protective coating to prevent from accidents from breakage of glass
- Multi-Pass headers in Metal for more efficient heat transfer
- Vertical installation possible with minor modifications
- GMP, cleanroom models available in all types
- Tubes of exotic materials such as Hastelloy etc. available on request in the same design
- Other process connection sizes can be modified as per application and user requirement
- Tubes of SiC and graphite also available, offering higher thermal conductivity.

Types of Shell And Heat Tube Exchangers

TYPE-I: Both Sides Corrosion Resistant

This is the universal and most common design of shell and tube heat exchanger, where both shell side and tube side are resistant to corrosion. It finds usage in applications such as condensation in the shell side, heat recovery, and cooling in a shell or tubes. With minor modifications, it can also be used as a falling film absorber and falling film evaporator.

TYPE-II: Shell Side Corrosion Resistant

Type-II Heat exchangers are very similar to Type-I but have Metal (Mild steel or Stainless Steel) Headers instead of glass headers. These are used in applications where there is no risk of corrosion at the service/utility side. The process side comes in contact only with the glass shell or PTFE components, and hence can be corrosive. Thus, this design is generally used for condensation and tempering of corrosive liquids.

TYPE-III: Tube Side Corrosion Resistant

Type-II Heat exchangers are very similar to Type-I but have Metal (Mild steel or Stainless Steel) Headers instead of glass headers. These are used in applications where there is no risk of corrosion at the service/utility side. The process side comes in contact only with the glass shell or PTFE components! And hence can be corrosive. Thus, this design is generally used For condensation and tempering Of corrosive liquids.

TYPE-IV: Shell Side Corrosion Resistant, High Tube Side Pressure!

A key factor due to which maximum permissible pressure is limited in Shell & Tube Heat Exchangers is the Tube sheet, which cannot withstand a high pressure since it is made of pure PTFE. In applications where corrosion is not an issue at the utility side, a reinforcing plate can be installed at the header side of the PTFE Tube Sheet. This increases the maximum pressure limit up to 6 Bar.

TYPE-V: Tube Side Corrosion Resistant; High Shell Side Pressure!

This design of the Shell and Tube Heat exchanger again uses the reinforcing metal plate to increase maximum permissible operating pressure. However, in this type, the pressure is raised

on the shell side since the plate is installed on the shell side of the Tube Sheet and not the header side.

Mode Of Construction

Ablaze offers a huge variety of MOCs to choose from, depending on process requirements

COMPONENT					
SHELL		HEADER		TUBES	
Material	Pressure + barg	Material	Pressure + barg	Material	Pressure + barg
Glass	1(2)	Glass	1(2)	Glass	3.5(6)
Mild Steel	6	Mild Steel	6	Silicon Carbide	3.5(10)
Stainless Steel	6	Stainless Steel	6	Graphite	3.5(6)
Enamel Lined	6	Enamel Lined	6		
PTFE Lined	6	PTFE Lined	6		

Technical specification

SR.No	Area m ²	DN(Shell Dia)	DN 1(Untity Inlet)	DN 2(Vapour Inlet)	DN 3(Liquid Drain)	DN 4(Vent)	L	L1	L2	L3	L4	L5
1	0.6	100	40	50	25	50	1150	340	255	125	110	135
2	1.0	100	40	50	25	50	1665	340	770	125	110	135
3	1.5	100	40	80	25	50	2365	365	1145	125	110	135
4	2.5	150	50	100	25	50	2065	375	1115	150	150	185
5	3.0	150	50	100	25	50	2365	375	1415	150	150	185
6	4.0	150	50	100	25	50	2965	375	2015	150	150	185
7	5.0	150	50	100	25	50	3665	375	2715	150	150	185
8	5.0	225	80	150	40	80	2065	460	985	210	180	220
9	6.3	225	80	150	40	80	2365	460	1285	210	185	220
10	8.0	225	80	150	40	80	2965	460	1885	210	185	220
11	10.0	225	80	150	40	80	3665	460	2585	210	185	220

12	10.0	300	80	225	50	100	206 5	550	815	275	230	270
13	12.5	300	80	225	50	100	236 5	550	1115	275	230	270
14	16.0	300	80	225	50	100	296 5	550	171 5	275	230	270
15	20.0	300	80	225	50	100	366 5	550	241 5	275	230	270
16	25.0	300	80	225	50	100	436 5	550	3115	275	230	270
17	35.0	400	100	225	50	150	341 5	700	186 5	350	275	325
18	40.0	400	100	225	50	150	371 5	700	216 5	350	275	325
19	40.0	450	100	225	50	150	301 5	700	141 5	380	300	325
20	45.0	400	100	225	50	150	441 5	700	286 5	350	275	325
21	45.0	450	100	225	50	150	341 5	700	181 5	380	300	325
22	50.0	400	100	225	50	150	441 5	700	286 5	350	275	325
23	50.0	450	100	225	50	150	371 5	700	221 5	380	300	325

