

Industrial Glass - [Heat Exchangers](#) - Shell and Tube

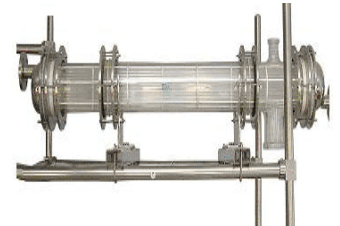
Shell & Tube heat exchangers offer large surface area in combination with efficient heat transfer and compactness. These are widely used in industries for various duties like cooling, heating, condensation, evaporation etc. Garg are the pioneers in the field of glass shell and tube heat exchangers in India and their product has wide market acceptability.

Salient Features :

1. Universal corrosion resistance an excellent alternative to expensive MOCs like graphite, hastelloy, copper titanium, tantalum and other exotic metals.
2. Excellent heat transfer as fouling does not occur on smooth glass surfaces.
3. Flexibility of installation vertical/horizontal.
4. Easy replacement of tubes for repair and cleaning.
5. Available in wide range of HTAs.
6. Ease of installation due to light weight.
7. Economical.
8. Suitable for applications where large HTAs are required in limited space.

Advantages Over Conventional Coil Type Heat Exchangers :

1. The overall heat transfer coefficient in shell and tube heat exchanger is about 3 times higher than in coil type heat exchanger.
2. The pressure drop in shell and tube heat exchanger is minimal compared to 2-3 kg/cm² in coil side of coil type heat exchanger.
3. For requirement of higher heat transfer areas shell and tube heat exchanger is the only alternative.



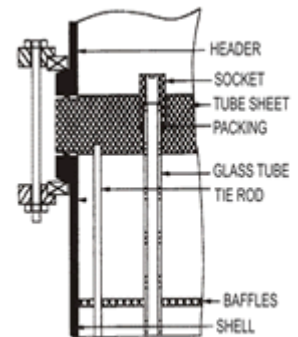
Construction Features :

The glass tubes are sealed individually into PTFE tube sheet with special PTFE sockets and packing. This unique ferrule type sealing arrangement permits easy replacement and cleaning of tubes. Baffles on shell side ensure improved heat transfer by increased turbulence. Further details of construction can be seen in the diagram.

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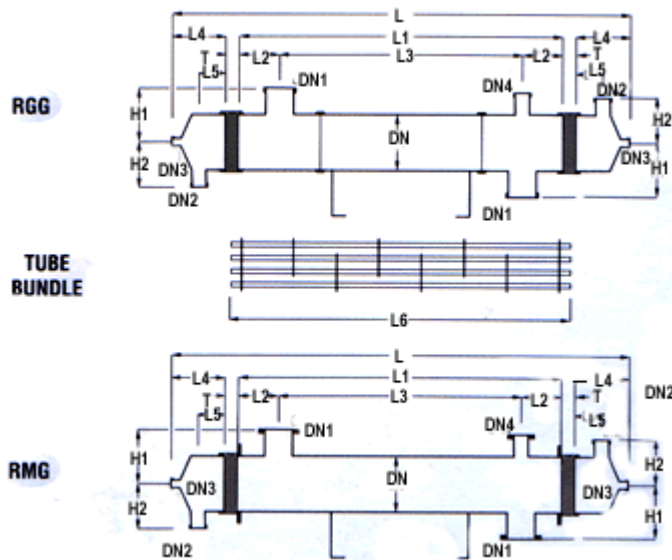
Three basic versions * are available :

Material Of Construction				
Model	Shell	Tube	Header	Duty
RGG	Glass	Glass	Glass	For heat transfer between two aggressive media.
RGM	Glass	Glass	Steel/FRP	For heat transfer between aggressive media in shell & non-aggressive media in tubes.
RMG	Steel/FRP	Glass	Glass	For heat transfer between aggressive media in tubes & non-aggressive media in shell



* Garg provides assistance to clients for selecting the right model for specific duty.

Dimensional Specifications :



Cat.Ref. RGG/RMG	6/3	6/4	6/5	6/6	9/6	9/8	9/10	9/12	12/12	12/16	12/21	12/25
Area (m2)	3	4	5	6	6	8	10	12	12	16	21	25
DN	150				225				300			
DN1	80				100				150			
DN2	50				50				80			
DN3	25				40				40			
DN4	50				50				50			
H1	175				250				300			
H2	150				200				250			
L	2500	3100	3700	4300	2620	3220	3820	4520	2550	3150	3950	4550
L1	1900	2500	3100	3700	1900	2500	3100	3800	1800	2400	3200	3800
L2	150	150	150	150	225	225	225	225	225	225	225	225
L3	1600	2200	2800	3400	1450	2050	2650	3350	1350	1950	2750	3350
L4	250	250	250	250	300	300	300	300	300	300	300	300
L5	125	125	125	125	175	175	175	175	175	175	175	175
L6	1980	2580	3180	3780	2000	2600	3200	3900	1930	2530	3330	3930
T	50				60				75			
No. of Tubes	37				73				151			
No. of Baffles	11	15	19	23	7	9	13	17	5	7	9	11

Nozzles in metal shell are drilled as per Table F

Range Of Applications :

Permissible temperature range for both shell & tube sides - 40° C to 150° C.
Maximum permissible temperature difference between shell & tube sides - 120° C.

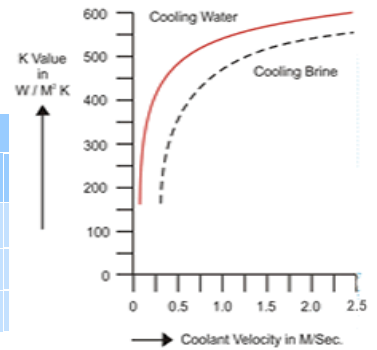
All sizes & models are suitable for full vacuum on both side. Maximum limiting pressures are tabulated here below :

Model	Side	Maximum Permissible Pressure Range, Kg/cm2(g)		
		150DN	225DN	300DN
RGG	Shell	2.0	1.0	1.0
	Tube	2.0	1.0	1.0
RGM	Shell	2.0	1.0	1.0
	Tube	3.5	3.5	3.5
RMG	Shell	3.5	3.5	3.5
	Tube	2.0	1.0	1.0

The above ranges of applications are admissible limiting values. For each specific case Garg recommends the admissible operating data based on the relations between pressure and temperature, size and model.

Performance & Design Data :

The particular advantage of shell & tube heat exchanger is high heat transfer performance. The relation between heat transfer and velocity of flow can be easily seen in the diagram. On receipt of the operating data from client the most favourable shell and tube heat exchanger is selected. This accurate design combined with most reliable quality assurance ensures economy and operational reliability for the user. For approximate sizing some typical heat transfer coefficients are given here below :



Media	Use	U-Values	
		kcal/m2hrk	W/m2k300 DN
Steam water	condensation	350-550	410-640
Water - water	cooling	250-350	290-410
Water - air	cooling	30-60	35-70