HORIZON
POLYMER

Lined Piping Systems

Assured high performance - PTFE liner combined with highly engineered patented Thermalok® process for lining

Horizon processes only approved grades of formulated PTFE resins and adapts a proprietary process to produce an optimized PTFE liner with strength best suited to handle all known corrosive chemicals and also help reduce permeation. The liner thickness provided by Horizon far exceeds the minimum dimensional thickness as specified in the ASTM.

The patented lining techniques applied for lining pipes ensures that the pipes will maintain dimensional stability under vacuum, pressure & thermal cyclic conditions which prevents liners from buckling and/or from flares getting cut-off or sucked in.

Pressure/Temperature Ratings

	150#		300#	
Temp.	PSI(G)	Bar(g)	PSI(G)	Bar(g)
20°C	250	17.2	450	31
50°C	244	17	425	29.3
100°C	235	16	390	26.9
150°C	215	14.8	345	23.8
200°C	299	13.9	295	20.3

- Pressure ratings for #150 dimensioned fittings are based on the rating in ANSI B 16.5
- Pressure ratings for #300 dimensional fittings are based on the rating in ANSI B 16.5 down rated to compensate for the decrease in mechanical properties at elevated temperature of the lining material

Vaccum/Temperature Ratings

Material	Temp.	25	40	50	80	100	150	200	250	300
PTFE	20 °C	Full	Full	Full	Full	Full	Full	Full	Full	Full
	100 °C	Full	Full	Full	Full	Full	Full	Full	Full	
	175 °C	Full	Full	Full	Full	Full	Full	Full		
	230 °C	Full	Full	Full	Full	Full	Full			
PVDF	20 °C	Full	Full	Full	Full	Full	Full	Full	Full	Full
	80 °C	Full	Full	Full	Full	Full				
	138 °C	Full	Full	Full	Full	Full				
PP	20 °C	Full	Full	Full	Full	Full	Full	Full	Full	Full
	93 °C	Full	Full	Full	Full	Full	Full	Full	Full	

- Limits of vacuum service are established by methods which comply with the relevant ASTM F methods for lined pipes

Material Specifications

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Liner	PTFE	Polytetrafluoroethylene, ASTM D4894 and D4895
	PFA	Perfluoroalkoxy, ASTM D3307
	PVDF	Polyvinylidence Fluoride, ASTM D3222
	PP	Polypropylene, ASTM D4101
Pipes	25 mm - 200 mm size,sch.40 Carbon Steel seamless quality of ASTM A 106 Gr.B 250 mm to 350 mm size PTFE Non-vacuum and PP = Sch.30 Carbon Steel Seamless quality of ASTM A 106 Gr.B.	
Flanges	Slip on 25 mm - 350 mm size plate material Indian std = 15:2062, dimensions per ANSI B 16.5 Class 150/300 Slip on 25 mm through 350 mm size Forged Steel ASTM A 105, dimensions per ANSI B16.5Class150/300	
Fittings	Fabricated Carbon Steel: Elbows 25 mm to 100 mm for PTFE lining as per ASTM A 234 Gr. WPB Cast Fittings: Ductile Iron Casting (60-40-18) per ASTM A 395 or Cast Steel per ASTM A 216 Gr.WCB. Fittings Flange Material: Ductile Iron Casting (60-40-18) per ASTM A395 or Cast Steel per ASTM A216 Gr.WCB or forged Steel per ASTM A105.	
Fabrication	Pipe and fittings Tolerances:	
	Dimension	Tolerance.in
	Length and Centerline Dimensions	± 3 mm
	Fixed Flange Bolt Hole Alignment	± 1.5 mm
	Flange Perpendicularity(With Pipe Centerline)	2.3 mm/ft of nom. Pipe diameter

Dimensional Standards	
Pipes	ANSI B 36.10
Ductile Iron	ANSI B 16.42 / ANSI B 16.5
Flanges	ANSI B 16.5 ASA 150#
Lining	ASTM F 1545 Standard

Testing/Inspection		Mechanical Properties			
Hydro Test	At 30 kg/cm^2, after lining		PTFE	PFA	FEP
Spark Test	At 25 KV	Tensile Strength, PSI (min)	3500	3800	3000
Dimensions	ASTM F1545 & Data sheets	Elongation, % (min)	300	300	250

General Notes

- All pipes have lap joint flange at one end and fixed flange at the other. Lined pipes are available up to a maximum length of 3m
- All fittings are supplied with fixed cast on or welded flanges only
- Suitable vent holes are provided for all pipes & fittings
- All pipe work will be supplied with suitable wooden end covers to protect the flare faces
- Material test certificates will be provided only if requested in the order
- External surfaces of all pipes and fittings will be painted with one coat of red oxide / zinc silicate primer