

**ETHYLENE™**

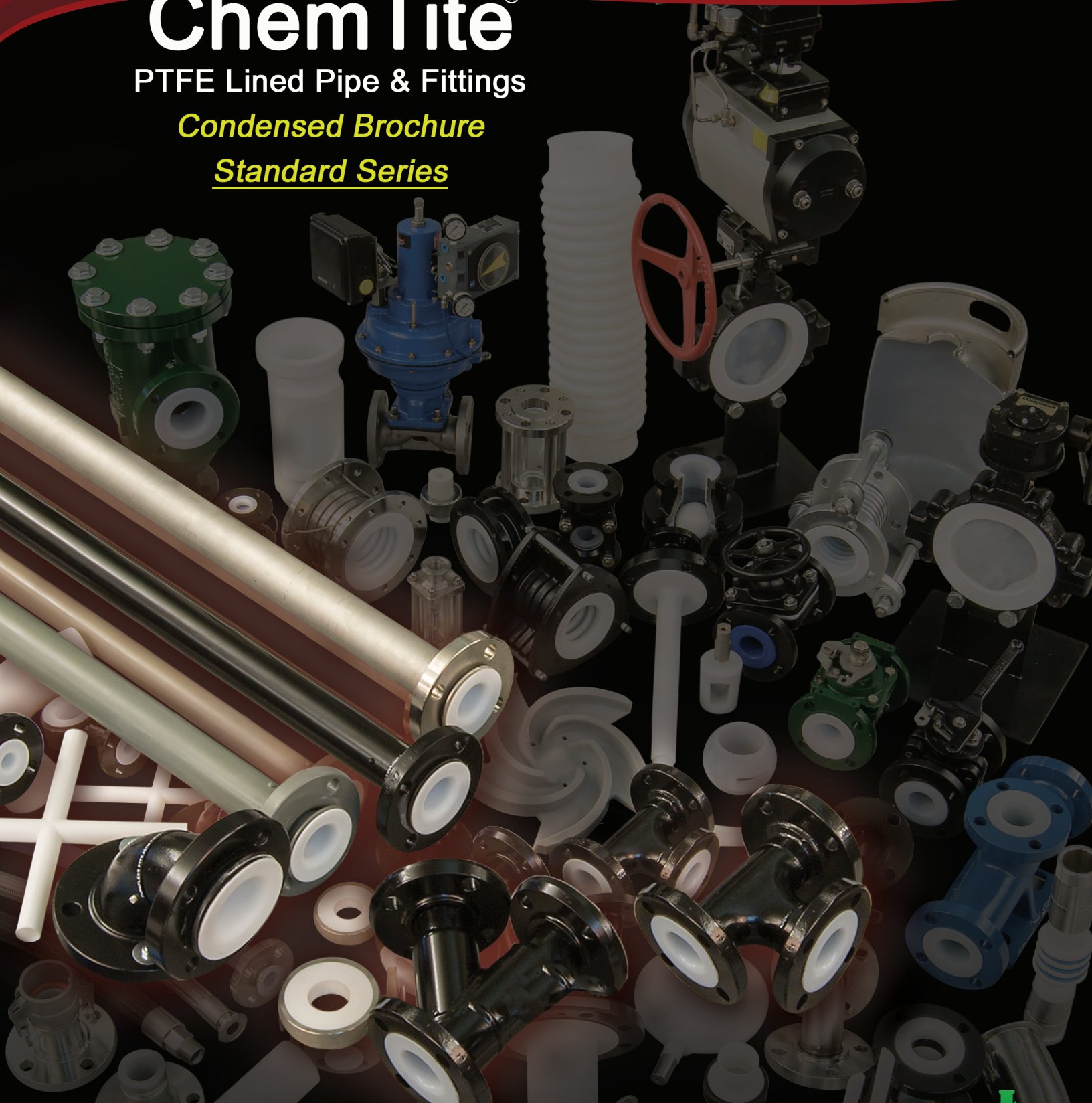


# ChemTite®

PTFE Lined Pipe & Fittings

*Condensed Brochure*

*Standard Series*



**7 DECADES OF PROVEN PERFORMANCE!**

*The Most Diverse and Experienced Global Fluoropolymer Manufacturer*



**ANDRONACO  
INDUSTRIES**



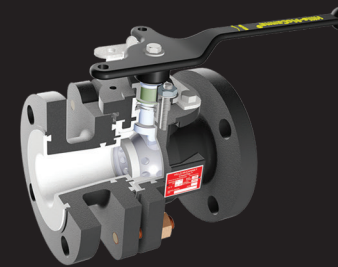
**Focus**

# Lined Steel Pipe Accessories

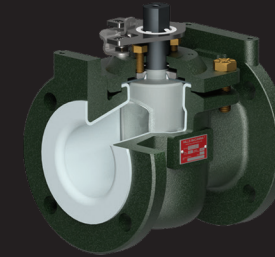
500,000 Sq. feet of Corrosion Resistant Technologies



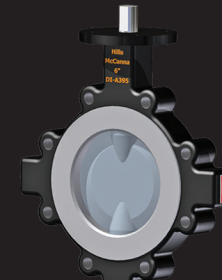
Manufactured by **ANDRONACO INDUSTRIES**



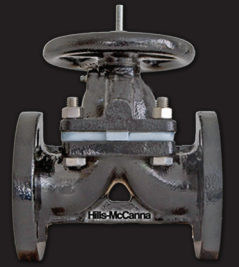
Hills-McCanna® PFA Lined Full Port & Std. Port Ball Valves  
Size Range 1" to 6"



Hills-McCanna® TFM / PFA Lined Plug Valves  
Size Range 1" to 8"



Hills-McCanna® Butterfly Valves  
PTFE / PFA / UHMWPE Seats, PFA / UHMWPE / Stainless / Titanium Discs  
Size Range 2" to 24"



Hills-McCanna® ETFE / PVDF or Polypro Lined Diaphragm Valves  
Size Range 1" to 8"



Hills-McCanna® PFA Lined Ball Check Valves  
Size Range 1" to 6"



T-Line™ ETFE or PFA Lined Basket Strainers with PTFE Basket  
Size Range 2" to 8"



Hills-McCanna® 360° Sight Flow Indicators  
PFA Lined Size Range 1" to 12"



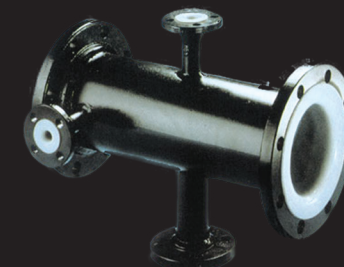
Hills-McCanna® Bullseye Sight Flow  
Size Range 1" to 24"



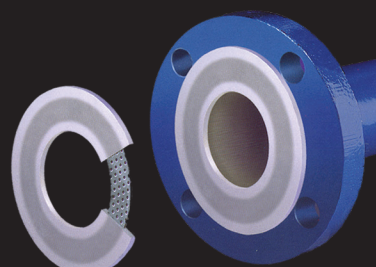
Flexijoint® PTFE Expansion Joint  
Size Range 1/2" to 42"  
2 to 12 convolutions



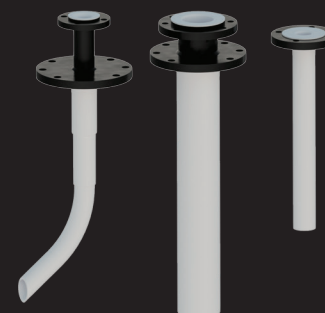
FlexArmor® PTFE Lined Metal Expansion Bellows  
Size Range 1 1/2" to 24"



Custom Rotolining ETFE / PFA / PVDF / PE Linings, Fittings & Tanks  
Size Range 1" to 142"

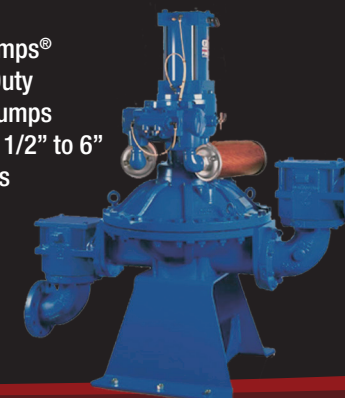


TASK-LINE® Gaskets  
Size Range 1/2" to 36"



Ethylarmor® Dip Tubes & Spargers  
Size Range 1" to 8" To 36 Feet Long

RamParts Pumps®  
Ultra Heavy Duty Diaphragm Pumps  
Size Range 1 1/2" to 6"  
Pass 3" Solids



PureFlex®  
PTFE / FEP / Silicone Lined Hoses & Fittings  
Size Range 1/8" to 6"



From lined pipe to lined valves to lined vessels and everything in between, ANDRONACO INDUSTRIES (AI) is focused on one thing:

## The Safe and Reliable Transfer of Corrosive Fluids





# ChemTite® Distinctive Features

## Ethylene's PTFE History

Founded in 1950, Ethylene's roots trace back to DuPont® and the pioneering development of PTFE lined products.

In 1958, Ethylene was the first company to employ PTFE Isostatic Molding processes and also the first company to process pure unmodified PTFE for its lined piping products. Competitors followed some three decades later.

Today, Ethylene processes Fluoropolymers in more ways than any other company. Processes include: Dry & Wet Isostatic Molding, Paste Extrusion, Ram Extrusion, Rotolining, Injection Molding, Intrusion Molding, Melt Extrusion, Resin Transfer Molding, Compression Molding and Vacuum Forming.



## Pure PTFE - No VOC's added

Ethylene utilizes only 100% pure virgin, high molecular weight PTFE resin in its manufacturing processes. NO pigments or solvent lubricants whatsoever are added to our PTFE liners.

Some competitors use a paste extruded process to manufacture their PTFE liners. This process uses a solvent based hydrocarbon as a lubricant to facilitate the extrusion process. These solvents are not only hazardous to the environment but could also contaminate contacting fluids in your process by leaching out, and / or liners could be vulnerable to blistering if not sintered properly causing premature failures.

## Super Heavy Duty PTFE Liners

Ethylene's ChemTite® seamless PTFE liners exceed the requirements of ASTM F1545. Liner thickness ranges from .130" for 1" pipe to .425" for 12" diameter piping. ChemTite's thick and high molecular weight liners aid in permeation resistance and are able to withstand full vacuum conditions to 450° F.

**\*Consult Factory for 14"- 42"  
Diameter Pipe & Fittings**

## The Ethylene Difference

At Ethylene, we focus on the complete lined pipe assembly: PTFE Liner and the Steel housing. Without question, the steel piping is a critical component of the piping assembly, it is the pressure retaining vessel. The PTFE liners only purpose is to protect the steel piping from being attacked by the fluid media.

## "Seamless" Steel Housing

Ethylene's ChemTite® Lined Steel Pipe employs "seamless" Schedule 40 steel or stainless pipe in sizes 1" to 8", Schedule 30 in 10", and Schedule 20 in 12" conforming to ASTM A53 grade B or ASTM A312.

The difference in the basic manufacturing method is obvious from the name. Seamless tube is extruded and drawn from a billet while welded tube is produced from a strip that is roll formed and welded to produce a tube. Welded tube is considerably less expensive than seamless, but it is severely compromised.

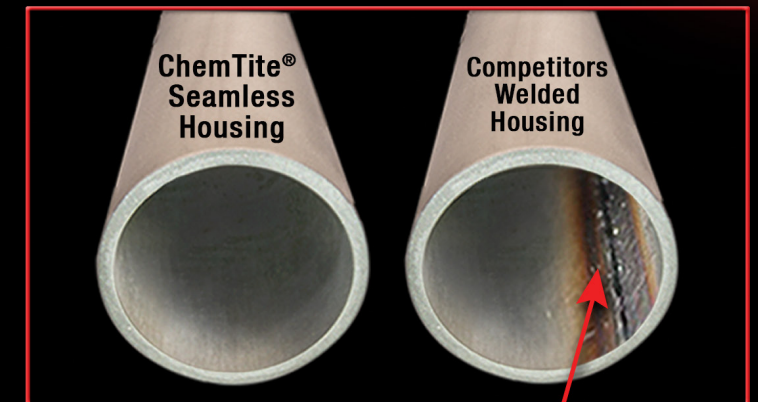
Although the working pressure of welded tube is 20% less than that for similar seamless tube, working pressure is not the determining factor for choosing seamless tube over welded tube for PTFE lined pipe. The difference is potential impurities, which reduce the corrosion resistance of the finished pipe. The welding process does change crystal structure, the composition of the metal, and hence mechanical and physical properties of the metal. These changes mean that at various locations across the weld and heat zone, you are dealing with effectively different alloys and grain size causing reduced chemical resistance and susceptibility to rapid corrosion attack.

**This is especially true when PTFE lined pipe manufacturers utilize welded pipe from poorly regulated foreign exporters.**

## Forged Steel Flanges

All ChemTite® rotating flanges on pipe and fittings come standard as forged steel ASTM A105. Competitors upcharge for this option.

Forged steel flanges offer better impact resistance and are less brittle than ductile iron flanges. A105 forged steel flanges also offer higher pressure ratings, better ultimate tensile and elongation compared to ductile iron.



**The welding process changes the composition of metal, causing reduced chemical resistance and susceptibility to rapid corrosion attack.**



## LINER Polytetrafluoroethylene (PTFE) ASTM D4894:

Liner Material Properties:		
LINER PROPERTIES	TEST METHOD	PTFE
Service Temperature (°F)	-	(-)20 to 450 °F
Min. Tensile Strength at Break (psi)	ASTM D386	3000
Min. Elongation at Break (%)	ASTM D638	250
Izod Impact Strength @ - 40°F	ASTM D256	1.5
Izod Impact Strength @ - 75°F	ASTM D256	3
Hardness Durometer (Shore D)	ASTM D2240	55
Thermal Conductivity (Btu-in/h-ft <sup>2</sup> -°F)	ASTM E1530	1.7
Dielectric Strength (V/mil)	ASTM D149	600
Surface Resistivity (Ω-sq.)	ASTM D257	>10 <sup>18</sup>
Water Absorption (%)	ASTM D570	<0.01
Specific Gravity	-	2.14-2.19
Static Coefficient of Friction	-	0.05
Liner Color	-	White
Liner Identification Band	-	Black with White Lettering

\*Optional Liners Available: PFA, PVDF, ETFE, Polypropylene or Polyethylene

## Carbon / Stainless Steel:

**PIPE** CARBON STEEL: ASTM A53 Gr. B Seamless or ASTM A106

STAINLESS STEEL: ASTM A312

• 1" - 8" : Schedule 40/40S

• 10" : Schedule 30

• 12" : Schedule 20

**FITTINGS** Fabricated Carbon Steel: ASTM A53, ASTM 513, ASTM A516 or ASTM A234 per ASME B16.9

Cast fittings: ASTM A395 Cast Ductile Iron or ASTM A216 Gr. WCB Cast Steel

Fabricated Stainless Steel: ASTM A312, ASTM A240 or ASTM A403 Gr. WPS per ASME B16.9

**FLANGES** ROTATING LAP JOINT OR FIXED SLIP-ON:

- ASTM A105 Forged Carbon Steel per ASME B16.5,
- ASTM A182 Forged Stainless Steel per ASME B16.5

FIXED THREADED

- ASTM A395 Cast Ductile Iron per ASME B16.42
- ASTM A182 Forged Stainless Steel per ASME B16.5

**TESTING** All qualifications per ASTM F1545 are conducted on representative samples including:

- Steam-cold water cycle product qualification testing
- High temperature product qualification testing
- Low temperature product qualification testing
- Vacuum product qualification testing
- All products are spark tested at 15 kV or hydrostatically tested at 1.5X design pressure prior to shipment

## Standard Exterior Coating:

Ethylene ChemTite® lined piping products are coated standard with a two-part high solids, high build, polyamide epoxy primer. When used as an intermediate coat as part of a multi-coat system, additional coats may be applied up to a maximum of 1 year to pipe / fittings not installed.

## Flange & Pipe Dimensions, PTFE Liner Thickness:

**Note:** Acceptable service temperature range is dependent on the process fluid.

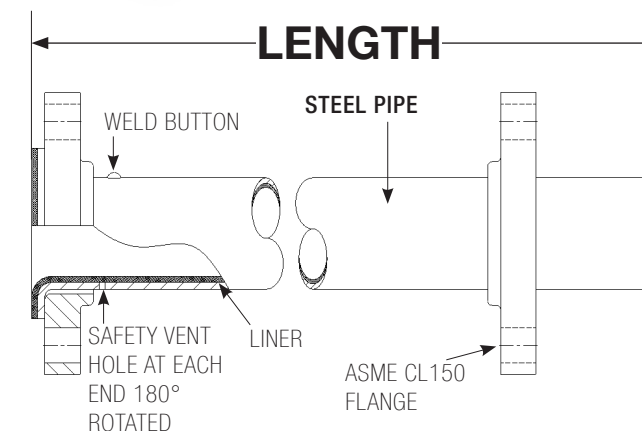
Nominal Pipe Dimensions & PTFE Liner Thickness					
Nominal Pipe Size (in)	Nominal Outside Dia. (in)	Nominal Wall Thickness (in)			Nominal PTFE Liner Thickness (in)
		Sch. 40	Sch. 30	Sch. 20	
1	1.315	0.133	-	-	.130
1-1/2	1.900	0.145	-	-	.150
2	2.375	0.154	-	-	.160
3	3.500	0.216	-	-	.160
4	4.500	0.237	-	-	.180
6	6.625	0.280	-	-	.280
8	8.625	0.322	-	-	.310
10	10.750	-	0.307	-	.350
12	12.750	-	-	0.25	.425

\*Consult Factory for Sizes 14"-42"

Nominal Flange Dimensions (in)					
Nominal Pipe Size	CL150				
	Flange OD	Min Flange Thickness	Bolt Circle Dia.	No. Bolt Holes	Bolt Hole Dia.
1	4 1/4	1/2	3 1/8	4	5/8
1-1/2	5	5/8	3 7/8	4	5/8
2	6	11/16	4 3/4	4	3/4
3	7 1/2	7/8	6	4	3/4
4	9	7/8	7 1/2	8	3/4
6	11	15/16	9 1/2	8	7/8
8	13 1/2	1 1/16	11 3/4	8	7/8
10	16	1 1/8	14 1/4	12	1
12	19	1 3/16	17	12	1

\*Consult Factory for Sizes 14"-42"

## Pipe Spools:



\*18" and shorter pipe spools have only one vent hole.

Min / Max Pipe Spool Length				
Size (in)	Max Length (ft)	Min Length (in)	With Vent Coupling or Grounding Studs (in)	CL150 Field Flare Threaded Flanges (in)
	CL150	CL150	CL150	
1	20	3	4 1/8	5 1/2
1-1/2	20	3 3/8	4 5/8	7
2	20	3 1/2	4 7/8	8
3	20	4	5 3/8	10 5/8
4	20	4 3/8	5 5/8	11
6	20	5 1/2	6 1/2	16 1/2
8	20	6 1/2	7	16 1/2
10	15	8 1/2	8 1/2	N/A
12	15	8 1/2	8 1/2	N/A

\*Consult Factory for CL300 Pipe & Fittings

\*Consult Factory for Sizes 14" - 42"

## Maximum Pressure & Vacuum Ratings

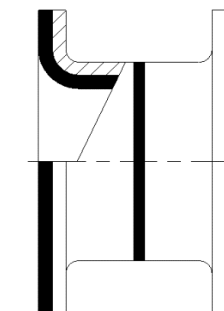
Temperature	CL150	Vacuum
100 °F	285 psig	Full
150 °F	285 psig	Full
200 °F	260 psig	Full
300 °F	230 psig	Full
400 °F	200 psig	Full
450 °F	200 psig	Full

## Pressure and Vacuum Ratings:

Pressure / temperature ratings of ChemTite® PTFE lined pipe and fittings are based on the industry standard published ratings for flanges by material grade. In general, ChemTite® PTFE lined pipe and fitting are fully vacuum rated up to 450°F.

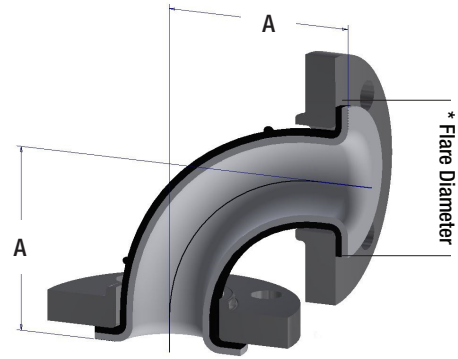
\*CL300 option available. Consult Factory.

## Distance Pieces:

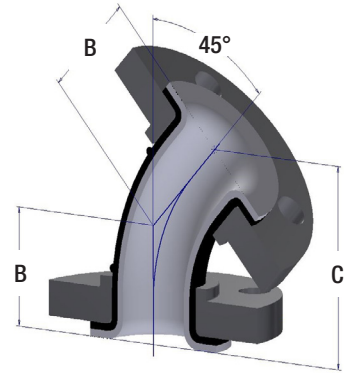


Distance Pieces (in)		
Size	Min Length	Max Length
1	3	3
1-1/2	3	3
2	3	3 1/2
3	3	4
4	3	4 3/8
6	3	5 1/2
8	3	6 1/2
10	3	7 1/2
12	3	8 1/2

\*Distance Pieces are used when more length than a spacer is required, but the bulk of flanges are undesirable. These are wafer components requiring longer studs to assemble.

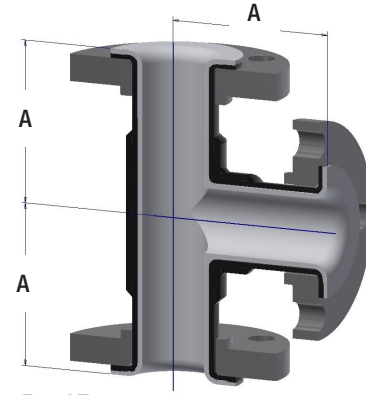


90° Elbow

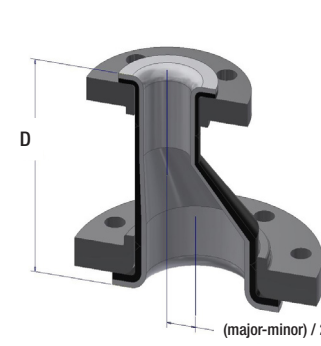


45° Elbow

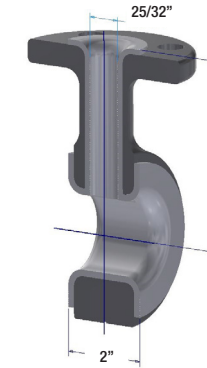
\* Fabricated Special Angle Elbows Available. Consult Factory.



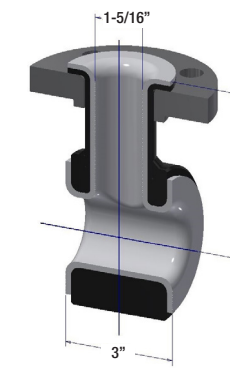
Equal Tee



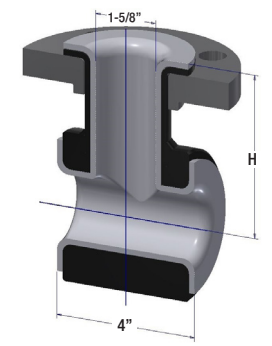
Eccentric Reducer



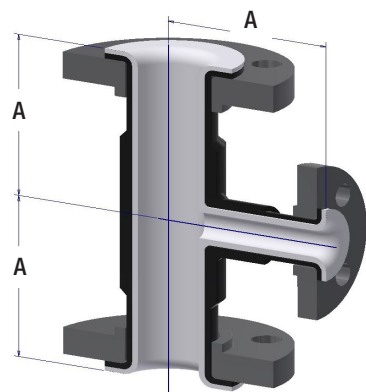
1" Branch Instrument Tee



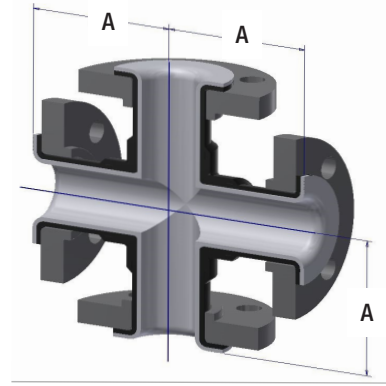
1 1/2" Branch Instrument Tee



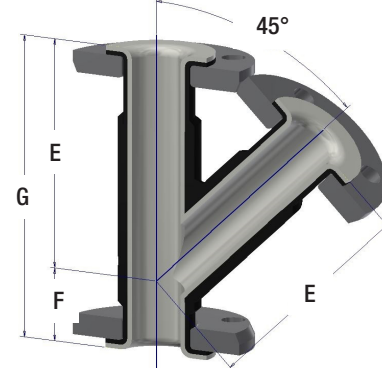
2" Branch Instrument Tee



Reducing Tee



Equal Cross



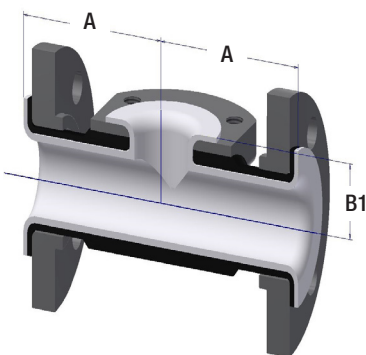
Lateral Half

ASME CL150 Flanged Fitting Dimensions (in)									
Size	A	B	C	D	E	F (G - E)	G	B1	H
1	3-1/2	1-3/4	3	4-1/2	5-3/4	1-3/4	7-1/2	1-1/4	3-1/2
1-1/2	4	2-1/4	3-27/32	4-1/2	7	2	9	1-1/2	4
2	4-1/2	2-1/2	4-1/4	5	8	2-1/2	10-1/2	1-3/4	4-1/2
3	5-1/2	3	5-1/8	6	10	3	13	2-3/4	5-1/2
4	6-1/2	4	6-13/16	7	12	3	15	3-1/4	6-1/2
6	8	5	8-9/16	9	14-1/2	3-1/2	18	4-1/4	8-1/16
8	9	5-1/2	9-3/8	11	17-1/2	4-1/2	22	5-1/4	9
10	11	6-1/2	11-1/8	12	-	-	-	6-1/4	10-3/8
12	12	7-1/2	12-13/16	14	-	-	-	7-5/16	11-7/8

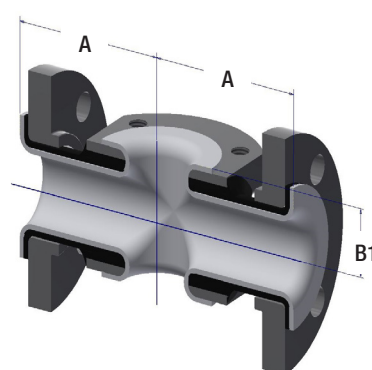
\* Flare - All flare diameters on all pipe & fittings are per ASTM F1545

Notes:

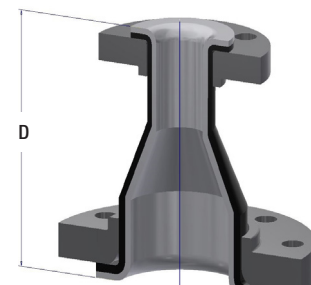
1. Fittings are available with fixed & rotating flanges.
2. Fittings are also available with DIN flange dimensions.
3. ASME CL150 fittings are available with CL300 flanges.
4. All dimensions are in inches and include the lining. (Tolerance +/- 1/8")
5. All fittings conform to ASME B16.42 or B16.5 dimensions after lining.



Short Stack Tee

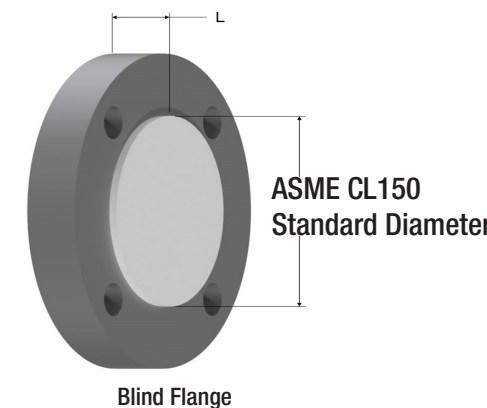


Short Stack Cross

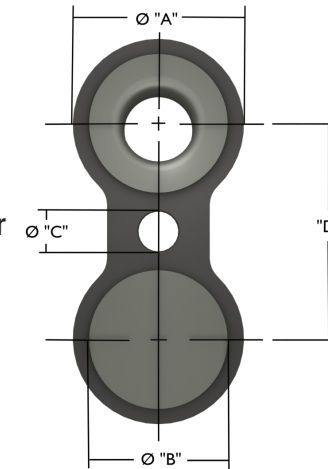


Concentric Reducer

### Blind & Spectacle Blind Flanges



Blind Flange



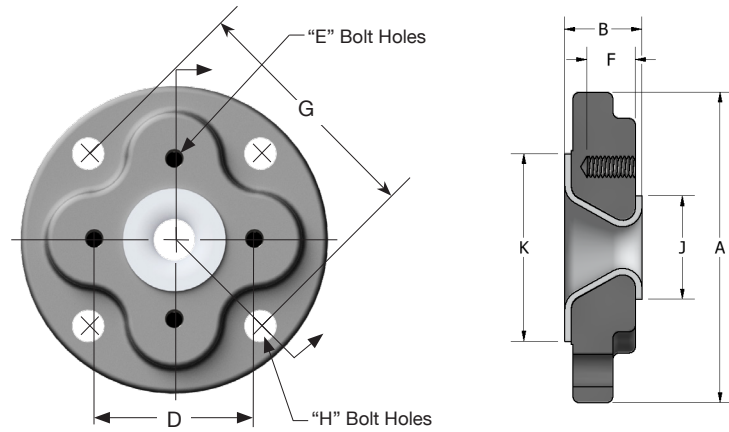
Spectacle Blind Flange

Blind & Spectacle Blind Flanges (in)						
Size	L	A	B	C	D	M
1	11/16	2-1/2	2	5/8	3-1/8	3/4
1-1/2	13/16	3-1/4	2-7/8	5/8	3-7/8	7/8
2	7/8	4	3-5/8	3/4	4-3/4	7/8
3	1-1/16	5-1/4	5	3/4	6	1-1/8
4	1-1/16	6-3/4	6-3/16	3/4	7-1/2	1-1/8
6	1-1/8	8-5/8	8-1/2	7/8	9-1/2	1-1/8
8	1-1/4	10-7/8	10-5/8	7/8	11-3/4	1-1/4
10	1-5/16	13-1/4	12-3/4	1	14-1/4	1-3/8
12	1-3/8	16	15	1	17	1-3/8

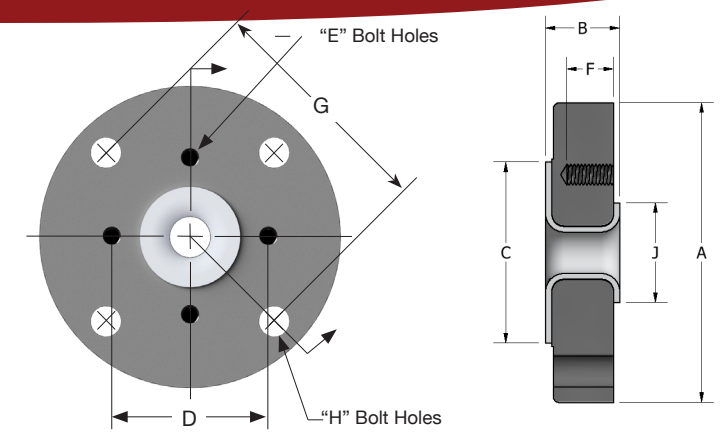


# ChemTite® Fittings & Dimensions

## Tapered Reducing Flange



## Full Bore Reducing Flange

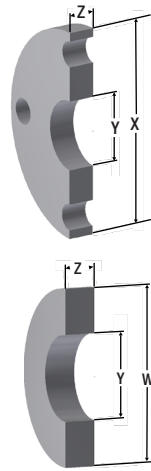


CL150 Flanged (in)													
Major Size	Minor Size	Thickness B	OD A	H - Bolt Holes			E - Bolt Holes				Flare Dimensions		Bolt Hole Rotation
				No.	Size	Bolt Circle Dia. G	No.	Size	Bolt Circle Dia. D	Depth F	K	J	
1-1/2	1	19/16	5	4	5/8	3 7/8	4	1/2-13	3 1/8	7/8	2 7/8	2	45
2	1	19/16	6	4	3/4	4 3/4	4	1/2-13	3 1/8	7/8	3 5/8	2	45
	1 1/2	19/16	6	4	3/4	4 3/4	4	1/2-13	3 7/8	7/8	5	2 7/8	45
3	1	15/8	7 1/2	4	3/4	6	4	1/2-13	3 1/8	3/4		2	45
	1 1/2	15/8	7 1/2	4	3/4	6	4	1/2-13	3 7/8	7/8		2 7/8	45
	2	13/4	7 1/2	4	3/4	6	4	5/8-11	4 3/4	7/8	6 3/16	3 5/8	45
4	1	17/8	9	8	3/4	7 1/2	4	1/2-13	3 1/8	11/16		2	none
	1 1/2	15/8	9	8	3/4	7 1/2	4	1/2-13	3 7/8	7/8		2 7/8	none
	2	2	9	8	3/4	7 1/2	4	5/8-11	4 3/4	7/8		3 5/8	none
	3	13/4	9	8	3/4	7 1/2	4	5/8-11	6	7/8	8 1/2	5	none
6	1 1/2	17/8	11	8	7/8	9 1/2	4	1/2-13	3 7/8	11/16		2 7/8	none
	2	17/8	11	8	7/8	9 1/2	4	5/8-11	4 3/4	3/4		3 5/8	none
	3	13/4	11	8	7/8	9 1/2	4	5/8-11	6	1		5	none
	4	2 1/8	11	8	7/8	9 1/2	8	5/8-11	7 1/2	7/8		6 3/16	none
8	4	2	13 1/2	8	7/8	11 3/4	8	5/8-11	7 1/2	7/8	10 5/8	6 3/16	22 1/2
	6	2	13 1/2	8	7/8	11 3/4	8	3/4-10	9 1/2	1 1/8		8 1/2	22 1/2
10	4	27/16	16	12	1	14 1/4	8	5/8-11	7 1/2	7/8	12 3/4	6 3/16	none
	6	27/16	16	12	1	14 1/4	8	3/4-10	9 1/2	1		8 1/2	none
	8	27/16	16	12	1	14 1/4	8	3/4-10	11 3/4	1	10 5/8	none	

CL150 Flanged (in)													
Major Size	Minor Size	Thickness B	OD A	H - Bolt Holes			E - Bolt Holes				Flare Dimensions		Bolt Hole Rotation
				No.	Size	Bolt Circle Dia. G	No.	Size	Bolt Circle Dia. D	Depth F	C	J	
1-1/2	1	13/16	5	4	1/2-13	3 7/8	4	1/2-13	3 1/8	7/16	2 7/8	2	45
2	1	7/8	6	4	5/8-11	4 3/4	4	1/2-13	3 1/8	1/2	3 5/8	2	45
3	1	13/16	7 1/2	4	5/8-11	6	4	1/2-13	3 1/8	5/8	5	2	---
	1 1/2	15/16							3 7/8			2 7/8	
	2							5/8-11	4 3/4			3 5/8	45
4	1	15/16	9	8	3/4	7 1/2	4	1/2-13	3 1/8	11/16	6 3/16	2	---
	1 1/2								3 7/8	5/8		2 7/8	
	2							5/8-11	4 3/4			3 5/8	
	3				3/4-10				6			5	
6	1	13/8	11	8	7/8	9 1/2	4	1/2-13	3 1/8	5/8	8 1/2	2	---
	1 1/2								3 7/8			27/8	
	2				3/4-10			5/8-11	4 3/4			3 5/8	
	3								6			5	
	4						8		7 1/2			6 3/16	22.5
8	2	1 1/2	13 1/2	8	7/8	11 3/4	4	5/8-11	4 3/4	5/8	10 5/8	3 5/8	---
	3								6			5	
	4						8		7 1/2			6 3/16	
	6				3/4-10			3/4-10	9 1/2	3/4		8 1/2	22.5
10	2	19/16	16	12	1	14 1/4	4	5/8-11	4 3/4	7/8	12 3/4	3 5/8	---
	3								6				
	4						8		7 1/2			6 3/16	
	6							3/4-10	9 1/2			8 1/2	
	8				7/8-9				11 3/4			10 5/8	
12	4	15/8	19	12	1	17	8	5/8-11	7 1/2	7/8	15	6 3/16	---
	6							3/4-10	9 1/2			8 1/2	
	8								11 3/4			10 5/8	
	10				7/8-9	t	12	7/8-9	14 1/4			12 3/4	

## Lined & Solid Ring Spacers

Solid & Full Face Ring Spacers (in)					
Size	W	X	Y	Z Min	Z Max
1	2 5/8	4 1/4	1	1/2	3
1-1/2	3 3/8	5	1 1/2		
2	4 1/8	6	2		
3	5 3/8	7 1/2	3		
4	6 7/8	9	4		
6	8 3/4	11	6		
8	11	13 1/2	8		
10	13 3/8	16	10		
12	16 1/8	19	12		



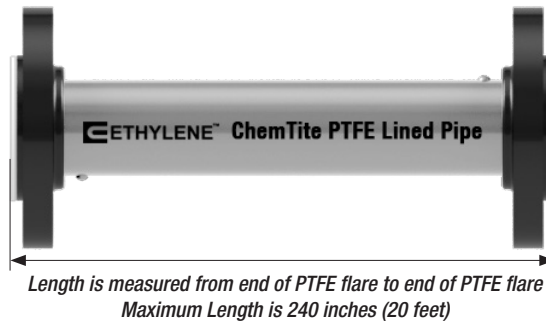
Lined Ring Spacers (in)			
Size	R	S Min	S Max
1	2 5/8	1/2	3
1-1/2	3 3/8		
2	4 1/8		
3	5 3/8		
4	6 7/8	3/4	
6	8 3/4		
8	11	1	
10	13 3/8		
12	16 1/8		



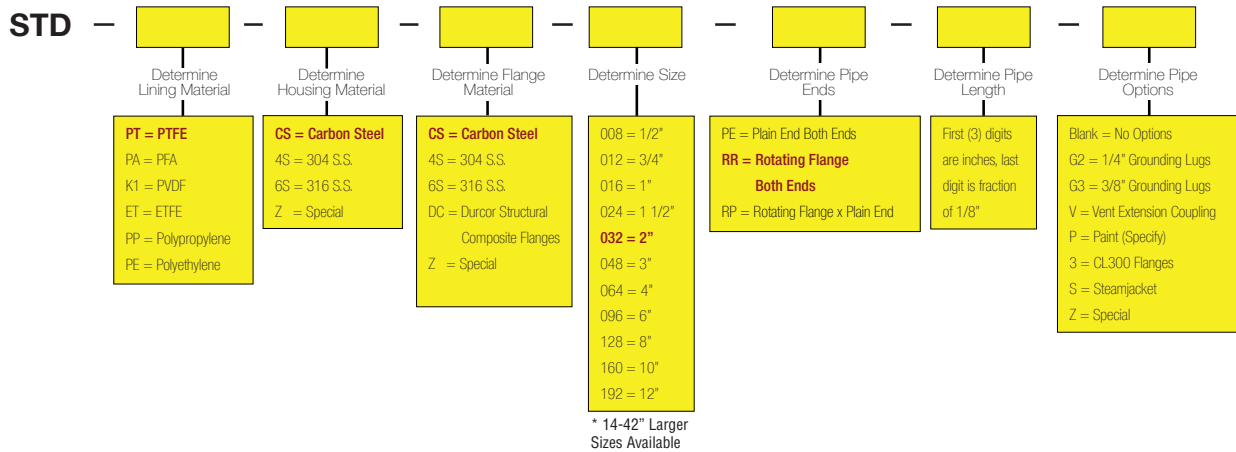
\*Tapered Spacers also available.  
Contact Factory for more information.



# ChemTite® How To Order

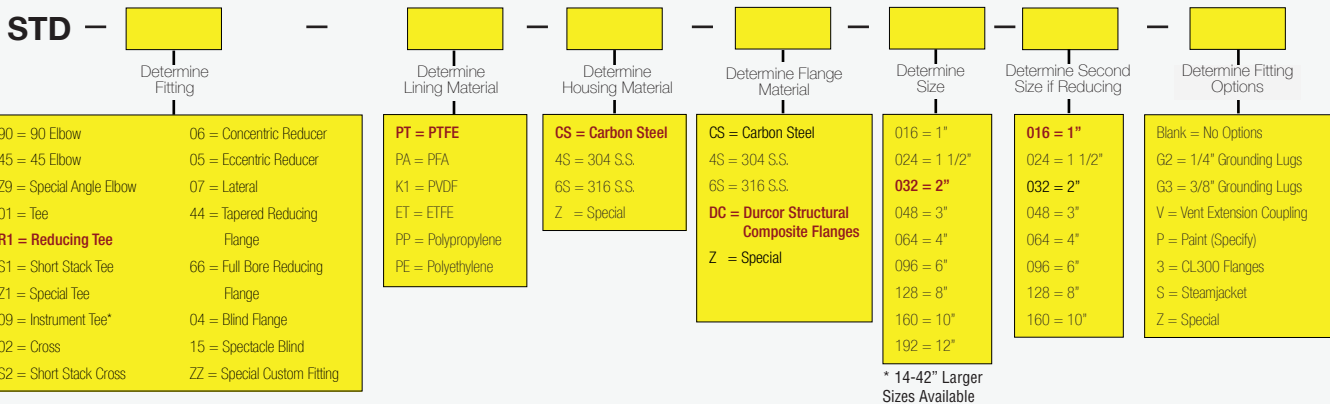


**Example:** 2" diameter ChemTite® Carbon Steel PTFE pipe spool, Rotating Carbon Steel Flanges, 36 1/8" long with no options  
**EXAMPLE PART NUMBER: STD-PT-CS-CS-032-RR-0361**



## Fittings How to Order

**Example:** PTFE 2" x 1" Carbon Steel Reducing Tee with Durcor Flanges with no options  
**EXAMPLE PART NUMBER: STD-R1-PT-CS-DC-032-016**



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