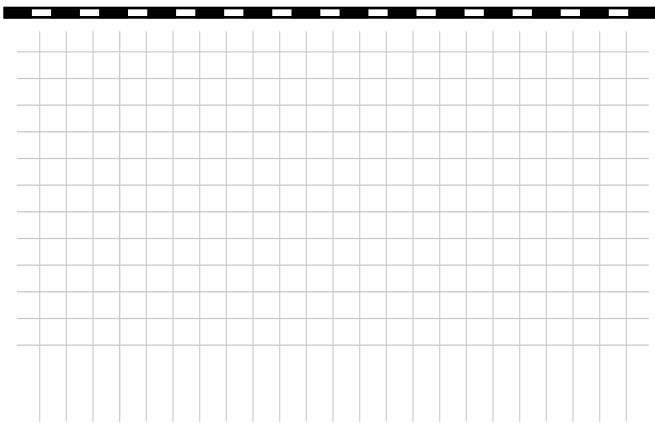


Chemical Process Piping Systems

Kynar[®] 740 PVDF Socket Fusion Dimensional Data

*Corrosion Resistant Fluid and
Air Handling Systems.*

SIMTECH



ChemicalProcess Piping Systems - **Dimensional Data**

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Chemical Process Piping Systems - Dimensional Data

SIMTECH GUIDE SPECIFICATION

KYNAR 740 – POLYVINYLIDENE FLUORIDE PIPING SYSTEM (PVDF)

1.0 PIPE

1.1 MATERIAL

Pipe shall be extruded from virgin, pure, unpigmented homopolymer KYNAR 740® resin, as manufactured by ARKEMA Chemicals, Inc. Material shall meet or exceed requirements of Table 1 of ASTM D-3222. Pipe manufacturing shall not employ any stabilizers, antioxidants, fillers, pigmentation or additives of any kind. Kynar homopolymer resins may be safely used in articles for repeated contact with food per Title 21, Code of Federal Regulations, Chapter 1, part 177.2510. Kynar homopolymer resin grades have been listed with NSF under Standard 61, Standard 51 and Standard 14

1.2 FLAMMABILITY

KYNAR homopolymer resins meet both the Factor Mutual 4910 (FM 4910) and corresponding UL 2360 burn test criteria. Specification test reports available upon request.

1.3 Stress Relieved

Pipe shall be stress relieved by post-extrusion annealing to eliminate inherent stresses in the pipe wall created by the extrusion process.

1.4 Pressure Rating

System (pipe and fittings) shall be pressure rated in accordance with ASTM D-2837. Pipe shall be manufactured to an SDR (standard dimension ratio) in order to provide the same pressure rating in all diameters. Pipe shall be (select one):

*PN16 (3/8" - 4") = 232 psi @ 73 degrees F

*PN = Nominal pressure rating in bar 1.5 Dimensions and Tolerances

All pipe and fittings shall comply with the dimensions and tolerances outlined in ASTM D-3261. Pipe shall have a 2.5 safety factor for a 50-year life. Pipe shall be furnished in 5-meter (16.4 ft) length.

2.0 FITTINGS

2.1 Material

See material under PIPE section 1.0 2.1 Pressure Fittings

All pressure pattern fittings (elbows, tees, flanges and reducers) from 3/8" (16 mm) through 12" (315 mm) shall be injection molded and shall have the same pressure rating as the pipe. Fittings shall not contain any stabilizer, antioxidants, fillers, pigmentation or additives of any kind. All fittings shall have a 2.5 safety factor for a 50-year life.

2.2 Drainage Pattern Fittings

Drain fittings (wyes, laterals, sanitary tees) may be fabricated by mitering and butt fusion welding or by side-wall fusion techniques. Extrusion welding is permitted. Hot air welding is not acceptable. Wall thickness of fabricated fitting shall be the same as the pipe.

2.0 JOINING

All pressure fitting 3/8" (16 mm) through 1 1/2" (50 mm) shall be an interference fit socket fusion type joint. Pressure fittings, drainage pattern fittings and pipe 2" and larger shall be joined by butt fusion welding. All fusion weld joints to be performed in accordance with ASTM D-2657-87 and piping manufacturers recommendations.

3.0 MANUFACTURER

SIMTECH

877-777-2467

www.SimtechUSA.com

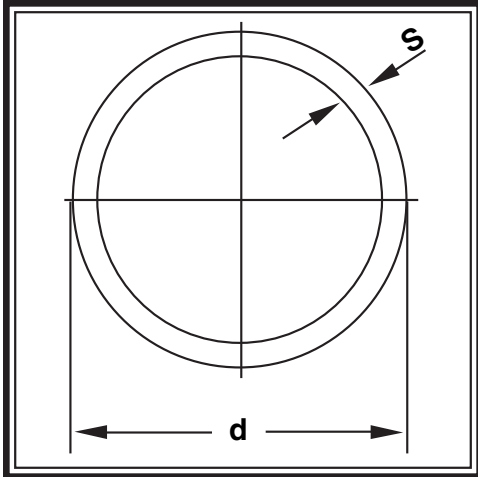
Chemical Process Piping Systems - Dimensional Data

Permissible Gauge Pressure For SIMTECH KYNAR 740 PVDF Depending Upon Temperature and Time

Temperature		Operation Years	PN10 PSI	Temperature		Operation Years	PN10 PSI
F	C			F	C		
68°	20°	1	257	176°	80°	1	128
		5	252			5	125
		10	248			10	123
		25	245			25	120
		50	244			50	117
86°	30°	1	238	194°	90°	1	109
		5	234			5	106
		10	229			10	103
		25	228			25	88
		50	226			50	77
104°	40°	1	213	212°	100°	1	91
		5	209			5	86
		10	205			10	74
		25	202			25	62
		50	200			50	52
122°	50°	1	191	230°	110°	1	77
		5	187			5	59
		10	183			10	51
		25	180			25	42
		50	173			50	36
140°	60°	1	162	248°	120°	1	59
		5	161			5	41
		10	158			10	35
		25	157			25	30
		50	154			50	0
158°	70°	1	148	266°	130°	1	58
		5	146			5	28
		10	144			10	0
		284°	140°	25	141	1	29
				50	136	5	20

Admissible working internal compression for SIMTECH PVDF pipe according to DSV 2205-1, (6.95) supplement 4 in dependence of temperature and time (dimensions according to ISO/DIS 10931-2)

Chemical Process Piping Systems - Dimensional Data



PRESSURE PIPE

Description: Pressure Pipe
PN16 / SDR 21 - 232psi

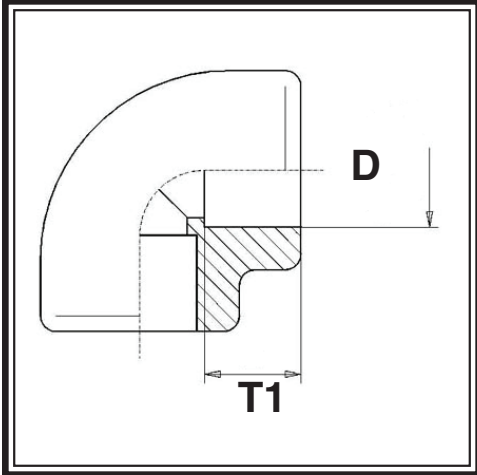
Material: Kynar® 740 PVDF

Connection: Socket Fusion

Nominal Size	Actual OD Size	d in	S in	Weight (lbs./ m)	Weight Lbs. Foot	Part Number
½"	0.787 (20mm)	0.787	0.075	0.462	0.144	PF06000020
¾"	0.984 (25mm)	0.984	0.075	0.592	0.185	PF06000025
1"	1.260 (32mm)	1.260	0.094	0.955	0.298	PF06000032
1¼"	1.575 (40mm)	1.575	0.094	1.219	0.381	PF06000040
1½"	1.969 (50mm)	1.969	0.118	1.857	0.580	PF06000050
2"	2.480 (63mm)	2.480	0.118	2.398	0.749	PF06000063
2½"	2.953 (75mm)	2.953	0.142	3.410	1.066	PF06000075
3"	3.543 (90mm)	3.543	0.169	4.884	1.526	PF06000090
4"	4.331 (110mm)	4.331	0.209	7.326	2.289	PF06000110

Chemical Process Piping Systems - Dimensional Data

90° Elbow



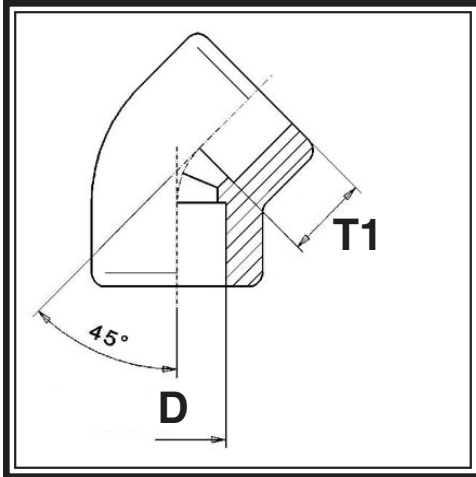
Description: 90° Elbow
PN16 / SDR 21 - 232psi

Material: Kynar® 740 PVDF

Connection: Socket Fusion

Nominal Size	Actual OD Size	D in	T1 in	Weight lbs	Part Number
½"	0.787 (20mm)	0.787	0.551	0.046	PF07010020
¾"	0.984 (25mm)	0.984	0.630	0.068	PF07010025
1"	1.260 (32mm)	1.260	0.709	0.108	PF07010032
1¼"	1.575 (40mm)	1.575	0.787	0.198	PF07010040
1½"	1.969 (50mm)	1.969	0.906	0.295	PF07010050
2"	2.480 (63mm)	2.480	1.063	0.552	PF07010063
2½"	2.953 (75mm)	2.953	1.280	1.298	PF07010075
3"	3.543 (90mm)	3.543	1.417	2.398	PF07010090
4"	4.331 (110mm)	4.331	1.634	3.410	PF07010110

Chemical Process Piping Systems - Dimensional Data



45° Elbow

Description: 45° Elbow
PN16 / SDR 21 - 232psi

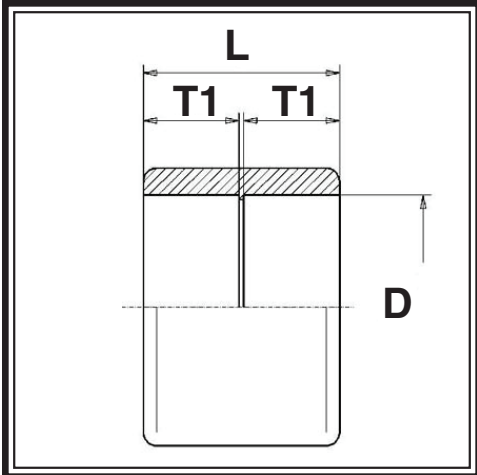
Material: Kynar® 740 PVDF

Connection: Socket Fusion

Nominal Size	Actual OD Size	D in	T1 in	Weight lbs	Part Number
½"	0.787 (20mm)	0.787	0.551	0.042	PF07020020
¾"	0.984 (25mm)	0.984	0.630	0.059	PF07020025
1"	1.260 (32mm)	1.260	0.709	0.088	PF07020032
1¼"	1.575 (40mm)	1.575	0.787	0.165	PF07020040
1½"	1.969 (50mm)	1.969	0.906	0.242	PF07020050
2"	2.480 (63mm)	2.480	1.063	0.403	PF07020063
2½"	2.953 (75mm)	2.953	1.260	0.924	PF07020075
3"	3.543 (90mm)	3.543	1.437	1.804	PF07020090
4"	4.331 (110mm)	4.331	1.634	2.706	PF07020110

Chemical Process Piping Systems - Dimensional Data

Coupling



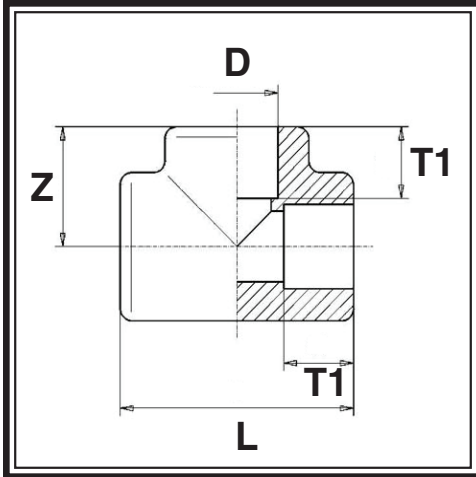
Description: Coupling
PN16 / SDR 21 - 232psi

Material: Kynar® 740 PVDF

Connection: Socket Fusion

Nominal Size	Actual OD Size	D in	L in	T1 in	Weight lbs	Part Number
½"	0.787 (20mm)	0.787	1.378	0.551	0.035	PF07110020
¾"	0.984 (25mm)	0.984	1.535	0.630	0.051	PF07110025
1"	1.260 (32mm)	1.260	1.693	0.709	0.081	PF07110032
1¼"	1.575 (40mm)	1.575	1.890	0.787	0.139	PF07110040
1½"	1.969 (50mm)	1.969	2.126	0.906	0.231	PF07110050
2"	2.480 (63mm)	2.480	2.441	1.063	0.321	PF07110063
2½"	2.953 (75mm)	2.953	2.756	1.280	0.638	PF07110075
3"	3.543 (90mm)	3.543	3.071	1.437	1.276	PF07110090
4"	4.331 (110mm)	4.331	3.543	1.673	1.672	PF07110110

Chemical Process Piping Systems - Dimensional Data



Tee

Description: Tee
PN16 / SDR 21 - 232psi

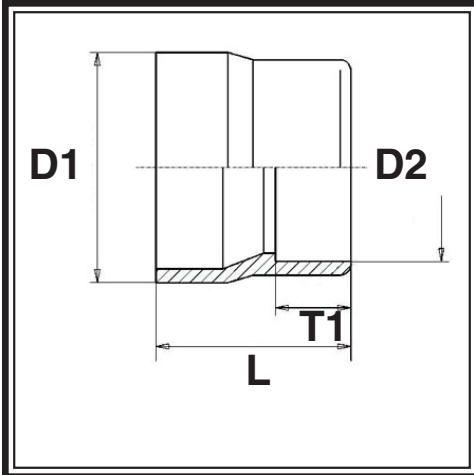
Material: Kynar® 740 PVDF

Connection: Socket Fusion

Nominal Size	Actual OD Size	D in	L in	T1 in	Z in	Weight lbs	Part Number
½"	0.787 (20mm)	0.787	2.205	0.551	1.102	0.077	PF07030020
¾"	0.984 (25mm)	0.984	2.520	0.630	1.260	0.110	PF07030025
1"	1.260 (32mm)	1.260	2.992	0.709	1.496	0.187	PF07030032
1¼"	1.575 (40mm)	1.575	3.465	0.787	1.732	0.297	PF07030040
1½"	1.969 (50mm)	1.969	4.016	0.906	2.008	0.458	PF07030050
2"	2.480 (63mm)	2.480	4.882	1.063	2.441	0.792	PF07030063
2½"	2.953 (75mm)	2.953	6.024	1.358	3.012	1.650	PF07030075
3"	3.543 (90mm)	3.543	7.205	1.417	3.524	3.278	PF07030090
4"	4.331 (110mm)	4.331	8.189	1.673	4.094	4.356	PF07030110

Chemical Process Piping Systems - Dimensional Data

Reducer Bushing



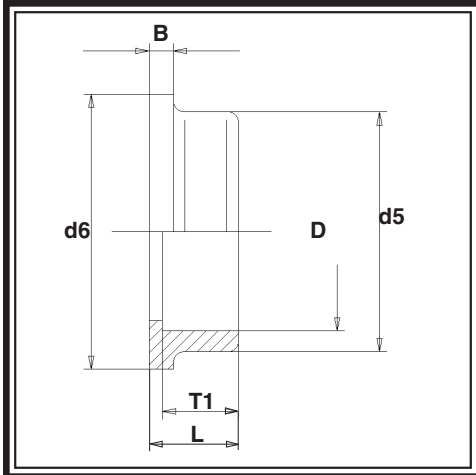
Description: Reducer Bushing
PN16 / SDR 21 - 232psi

Material: Kynar® 740 PVDF

Connection: Socket Fusion

Nominal Size	Actual OD Size	D1 in	D2 in	L in	T1 in	Weight lbs	Part Number
¾" x ½"	0.984 (25mm) x 0.787 (20mm)	0.984	0.787	1.457	0.551	0.037	PF0704025020
1" x ½"	1.260 (32mm) x 0.787 (20mm)	1.260	0.787	1.693	0.630	0.048	PF0704032020
1" x ¾"	1.260 (32mm) x 0.984 (25mm)	1.260	0.984	1.535	0.630	0.051	PF0704032025
1¼" x ½"	1.575 (40mm) x 0.787 (20mm)	1.575	0.787	1.890	0.551	0.073	PF0704040020
1¼" x ¾"	1.575 (40mm) x 0.984 (25mm)	1.575	0.984	1.890	0.630	0.081	PF0704040025
1¼" x 1"	1.575 (40mm) x 1.260 (32mm)	1.575	1.260	1.693	0.709	0.081	PF0704040032
1½" x ½"	1.969 (50mm) x 0.787 (20mm)	1.969	0.787	2.126	0.551	0.130	PF0704050020
1½" x ¾"	1.969 (50mm) x 0.984 (25mm)	1.969	0.984	2.126	0.630	0.128	PF0704050025
1½" x 1"	1.969 (50mm) x 1.260 (32mm)	1.969	1.260	2.126	0.709	0.136	PF0704050032
1½" x 1¼"	1.969 (50mm) x 1.575 (40mm)	1.969	1.575	1.890	0.787	0.139	PF0704050040
2" x ½"	2.480 (63mm) x 0.787 (20mm)	2.480	0.787	2.520	0.630	0.227	PF0704063020
2" x ¾"	2.480 (63mm) x 0.984 (25mm)	2.480	0.984	2.520	0.630	0.231	PF0704063025
2" x 1"	2.480 (63mm) x 1.260 (32mm)	2.480	1.260	2.520	0.709	0.238	PF0704063032
2" x 1¼"	2.480 (63mm) x 1.575 (40mm)	2.480	1.575	2.520	0.787	0.257	PF0704063040
2" x 1½"	2.480 (63mm) x 1.969 (50mm)	2.480	1.969	2.126	0.906	0.033	PF0704063050
2½" x 2"	2.953 (75mm) x 2.480 (63mm)	2.953	2.480	2.520	1.126	0.462	PF0704075063
3" x 2"	3.543 (90mm) x 2.480 (63mm)	3.543	2.480	3.425	1.142	0.792	PF0704090063
3" x 2½"	3.543 (90mm) x 2.953 (75mm)	2.756	2.953	3.425	1.299	0.792	PF0704090075
4" x 2"	4.331 (110mm) x 2.480 (63mm)	4.331	2.480	3.465	1.154	1.056	PF0704110063
4" x 3"	4.331 (110mm) x 3.543 (90mm)	4.331	3.543	3.425	1.398	1.276	PF0704110090

Chemical Process Piping Systems - Dimensional Data



Stub End

Description: Stub End
PN16 / SDR 21 - 232psi

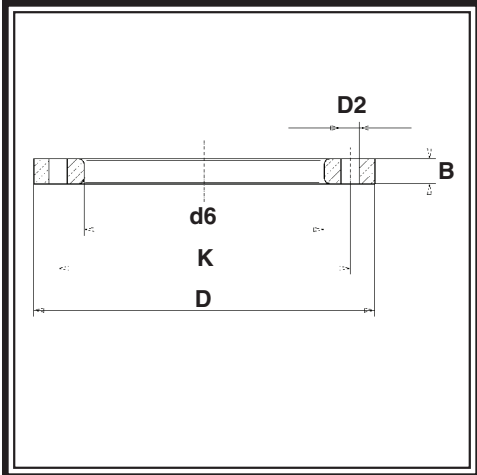
Material: Kynar® 740 PVDF

Connection: Socket Fusion

Nominal Size	Actual OD Size	D in	d5 in	d6 in	L in	T1 in	B in	Weight lbs	Part Number
½"	0.787 (20mm)	0.787	1.024	1.732	0.846	0.571	0.394	0.040	PF07060020
¾"	0.984 (25mm)	0.984	1.260	2.126	0.858	0.630	0.394	0.055	PF07060025
1"	1.260 (32mm)	1.260	1.535	2.480	0.974	0.709	0.394	0.070	PF07060032
1¼"	1.575 (40mm)	1.575	1.890	2.874	1.102	0.807	0.433	0.143	PF07060040
1½"	1.969 (50mm)	1.969	2.362	3.228	1.280	0.925	0.472	0.213	PF07060050
2"	2.480 (63mm)	2.480	2.835	3.976	1.447	1.083	0.551	0.334	PF07060063
2½"	2.953 (75mm)	2.953	3.543	4.724	1.388	1.260	0.394	0.506	PF07060075
3"	3.543 (90mm)	3.543	4.291	4.921	1.722	1.417	0.433	0.682	PF07060090
4"	4.331 (110mm)	4.331	5.157	5.906	1.811	1.693	0.472	1.012	PF07060110

Chemical Process Piping Systems - Dimensional Data

Backing Ring

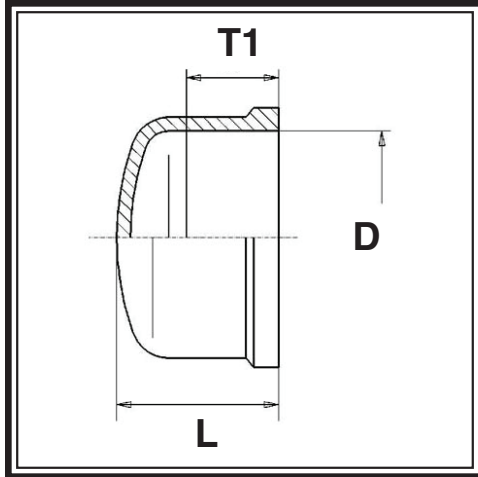


Description: Backing Ring
150 lbs. ANSI Drilling

Material: Glass Filled Polypropylene with Steel Core

Nominal Size	Actual OD Size	B in	D in	D2 in	d6 in	K in	# Holes	Weight lbs	Part Number
1/2"	0.787 (20mm)	0.472	3.504	0.630	1.240	2.362	4.000	0.484	PP99070020
3/4"	0.984 (25mm)	0.472	3.858	0.630	1.319	2.756	4.000	0.660	PP99070025
1"	1.260 (32mm)	0.630	4.252	0.630	1.634	3.110	4.000	0.970	PP99070032
1 1/4"	1.575 (40mm)	0.630	4.606	0.630	1.988	3.504	4.000	1.188	PP99070040
1 1/2"	1.969 (50mm)	0.709	5.000	0.630	2.421	3.858	4.000	1.254	PP99070050
2"	2.480 (63mm)	0.709	5.984	0.748	3.051	4.764	4.000	1.782	PP99070063
2 1/2"	2.953 (75mm)	0.709	7.008	0.748	3.484	5.512	4.000	2.418	PP99070075
3"	3.543 (90mm)	0.709	7.480	0.748	4.252	5.984	4.000	2.330	PP99070090
4"	4.331 (110mm)	0.709	9.016	0.748	5.039	7.520	8.000	4.048	PP99070110

Chemical Process Piping Systems - Dimensional Data



End Cap

Description: End Cap
PN16 / SDR 21 - 232psi

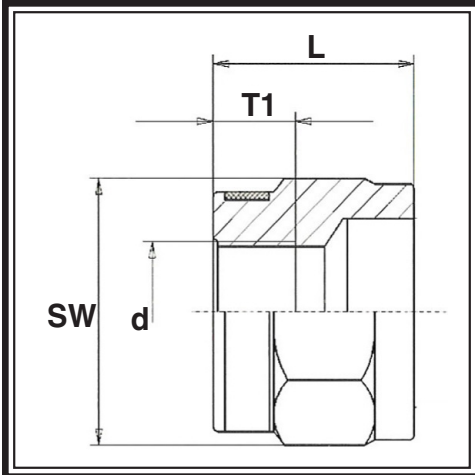
Material: Kynar® 740 PVDF

Connection: Socket Fusion

Nominal Size	Actual OD Size	D in	L in	T1 in	Weight lbs	Part Number
½"	0.787 (20mm)	0.787	0.906	0.551	0.022	PF07090020
¾"	0.984 (25mm)	0.984	1.024	0.630	0.037	PF07090025
1"	1.260 (32mm)	1.260	1.181	0.709	0.062	PF07090032
1¼"	1.575 (40mm)	1.575	1.339	0.787	0.055	PF07090040
1½"	1.969 (50mm)	1.969	1.535	0.906	0.081	PF07090050
2"	2.480 (63mm)	2.480	1.811	1.063	0.282	PF07090063
2½"	2.953 (75mm)	2.953	2.598	1.319	0.660	PF07090075
3"	3.543 (90mm)	3.543	3.031	1.437	1.166	PF07090090
4"	4.331 (110mm)	4.331	3.622	1.673	1.782	PF07090110

Chemical Process Piping Systems - Dimensional Data

Female Adapter



Description: Threaded Female Adapter
PN16 / SDR 21 - 232psi

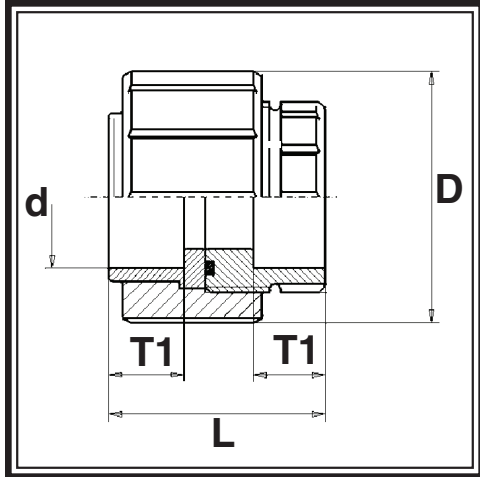
Material: Kynar® 740 PVDF

Connection: Socket Fusion

Nominal Size	Actual OD Size	d in	L in	T1 in	Weight lbs	Part Number
½"	0.787 (20mm)	0.787	1.339	0.512	0.070	PF07140020
¾"	0.984 (25mm)	0.984	1.496	0.630	1.012	PF07140025
1"	1.260 (32mm)	1.260	1.693	0.709	1.320	PF07140032
1¼"	1.575 (40mm)	1.575	1.850	0.787	0.308	PF07140040
1½"	1.969 (50mm)	1.969	2.087	0.866	0.528	PF07140050
2"	2.480 (63mm)	2.480	2.362	0.984	0.836	PF07140063

Chemical Process Piping Systems - Dimensional Data

Union with VITON



Description: Union with VITON O-Ring
PN16 / SDR 21 - 232psi

Material: Kynar® 740 PVDF

Connection: Socket Fusion

Nominal Size	Actual OD Size	d in	D in	L in	T1 in	Weight lbs	Part Number
½"	0.787 (20mm)	0.787	1.772	1.772	0.551	0.141	PF07100020
¾"	0.984 (25mm)	0.984	2.165	1.929	0.630	0.222	PF07100025
1"	1.260 (32mm)	1.260	2.441	2.087	0.709	0.290	PF07100032
1¼"	1.575 (40mm)	1.575	2.953	2.323	0.787	0.482	PF07100040
1½"	1.969 (50mm)	1.969	3.307	2.638	0.906	0.636	PF07100050
2"	2.480 (63mm)	2.480	3.976	3.110	1.063	1.091	PF07100063

ChemicalProcess Piping Systems - **Dimensional Data**

HANGING PRACTICES

Hanging any thermoplastic system is not that much different than hanging a metal system. Typically the spacing between hangers is shorter, due to the flexibility of plastic. In addition, the type of hanger is important.

Hanging Distances

Hangers should be placed based on the spacing requirements. Since thermoplastic materials vary in strength and rigidity, it is important to select hanging distances based on the material you are hanging. Also, operating conditions must be considered. If the pipe is operated at a higher temperature, then the amount of hangers will be increased. Finally, if the system is exposed to thermal cycling, the placement of hangers, guides, and anchors is critical. In these cases, the hanger locations should be identified by the system engineer and laid out to allow for expansion and contraction of the pipe over its life of operation.

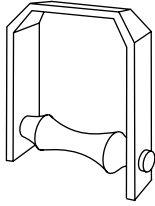
Hanger Types

When selecting hangers for a system, it is important to avoid using a hanger that will place a pinpoint load on the pipe when tightened. For example, a U-bolt hanger is not recommended for thermoplastic piping.

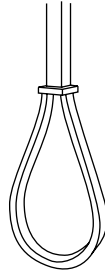
Hangers that secure the pipe 360° around the pipe are preferred. Thermoplastic clamps are also recommended over metal clamps, as they are less likely to scratch the pipe in the event of movement. If metal clamps are specified for the project, they should be inspected for rough edges that could damage the pipe. Ideally, if a metal clamp is being used, an elastomeric material should be used in between the pipe and the clamp. This is a must for PVDF and E-CTFE systems, which are less tolerant to scratching. Figure 2 illustrates some recommended hanger types.

Chemical Process Piping Systems - Dimensional Data

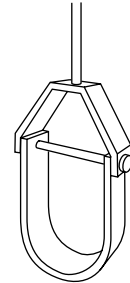
Typical Plastic Piping Restraints / Hangers



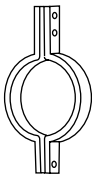
Roller Hanger



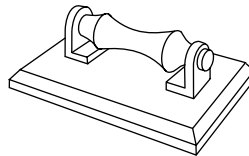
Adjustable Solid Ring
(swivel type)



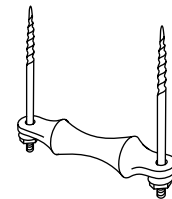
Clevis Hanger



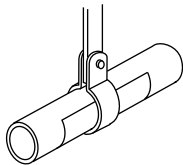
Double-Bolt Clamp



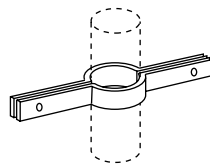
Pipe Roller and Plate



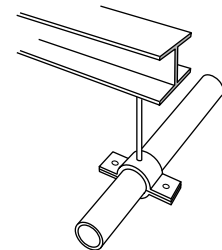
Single Pipe Roller



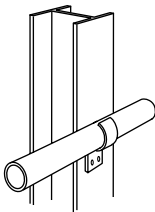
Band Hanger with
Protective Sleeve



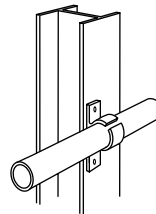
Riser Clamp



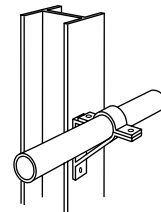
Suspended Ring Clamp



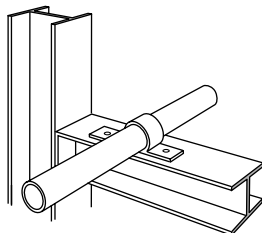
Vertical Clamp



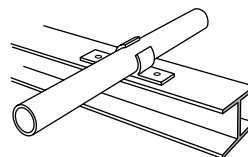
Vertical Pipe Clip



Vertical Offset Clamp



U-Type Clamp



Horizontal Pipe Clip

Chemical Process Piping Systems - **Dimensional Data**

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Simtech Industrial Products, Inc.

47-A Runway Road, Levittown, PA 19057
Phone: 215-547-0444 Fax: 215-547-9129
E-mail: info@SimtechUSA.com
Web site: www.SimtechUSA.com

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