



Materials For
Industry

PVDF Fluid Handling Tubing and Pipe



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Summary of Properties

Fluoropolymer Tubing Products

The table below lists the summary of mechanical, electrical and thermal properties of the resins from which Partek/Atlantic manufactures its line of tubing and pipe.

MECHANICAL PROPERTIES	ASTM	UNITS	PFA	FEP	PTFE	PVDF
Tensile Strength	D 1708	PSIG	4,000	3,500	2,500-4,000	D 638 13,300
Specific Gravity	D 792		2.15	2.15	2.13-2.24	1.8
Coefficient of Friction	Dynamic (<10 ft/min)		0.2	0.2	0.1	0.14 0.17
Compressive Strength	D 695	PSIG		2,200	3,500	11,600
Impact Strength 73°F	D 256	Ft-Lb/in	No Break	No Break	3.5	3-6
Flexural Modulus 73°F	D 790	PSIG	95,000	95,000	27,000	
Tensile Modulus	D 638	PSIG	40,000	60,000	80,000	348,000
Hardness-Durometer	D 2240		D-60	D-55	D-50-65	D-76-80
Elongation	D 1708	%	300	300	200-400	D 638 150
Flexural Strength	D 790	PSIG	No Break	No Break	No Break	10,750
Water Absorption	D 570	%	0.03	<0.01	<0.01	<0.04
Deformation Under Load (73°F, 1000 PSIG, 24 HR)	D 621		2.0	1.8	3.5	
Linear Coefficient of Expansion (70-212°F) (212-300°F) (300-408°F)	D 696	in/in/°F	6.7 x 10 ⁵ 9.4 x 10 ⁵ 11.1 x 10 ⁵	4.5-5.8 x 10 ⁵	3.8 5 x 10 ⁵ 4.2 5 x 10 ⁵ 5.0 5 x 10 ⁵	7.1 x 10 ⁵
Flex Life (MIT)			15,000	15,000	>1,000,000	
Creep Resistance	D 674	LB/Sq In	40,000			
ELECTRICAL PROPERTIES	ASTM	UNITS	PFA	FEP	PTFE	PVDF
Dielectric Strength (Short Term) 10Mil Film	D 149	V/Mil	>2,000	>2,000	>1,400	>1,080
Volume Resistivity	D 257	ohm-cm	10 ¹⁶	>10 ¹⁶	>10 ¹⁶	10 ¹³
Surface Resistivity	D 257	ohm/Sq	>10 ¹⁷	>10 ¹⁶	>10 ¹⁶	
THERMAL PROPERTIES	ASTM	UNITS	PFA	FEP	PTFE	PVDF
Continuous Service Temperature		°F	500	400	500	235
Melting Point	DTA	°F	575-590	500-530	635-650	352
Thermal Conductivity	C-177	BTU/hr/ft ² /°F. in	1.32	1.4	1.7	1.31
Heat of Fusion		BTU/lb	13	11	29-37	
Specific Heat 25°C 100°C 200°C 275°C	C-177	Cal/g/°C	0.256 0.283 0.334 0.391	0.26	0.23 0.25 0.27 0.29	.30-.34
Deflexion Temperature 86 PSI 264 PSI		°F	166 118	138 134	252 131	235
Heat of Combustion		BTU/lb	2,200		2,200	
OTHER PROPERTIES	ASTM	UNITS	PFA	FEP	PTFE	PVDF
Flammability Rating	UL 94		VO	VO	VO	VO
Retractive Index	D 542		1.35	1.338	1.35	
Limiting Oxygen Index			>95	>95	>95	

Product Overview:

PVDF (Polyvinylidene Fluoride) is a tough engineering Fluoropolymer that offers a combination of properties beneficial for use in many critical applications requiring chemical resistance with low permeability. PVDF exhibits low extractable levels, while providing high mechanical strength, excellent abrasion resistance, and good resistance to many chemicals and solvents. Atlantic's PVDF tubing is excellent for use in ultra pure water systems and for ground water monitoring.

Features:

100% virgin PVDF resin used on all products.

Good chemical resistance.

Low permeability.

Weather resistant.

UV and radiation resistance.

High abrasion resistance and thermal stability.

FDA Compliant.

Benefits:

No process contamination.

Useful in most applications with long cycle life.

Useful in severe chemical and gas applications.

Excellent for outdoor use under extreme conditions.

Useful in severe applications.

Useful in thermal cycling applications.

Useful in food applications.

Specifications:

Materials:

Products in this catalog are manufactured using resins complying with ASTM D 3222 Specification.

Flammability:

Listed 94-VO rated by the Underwriters' Laboratories, Inc. in their burning test classification for polymeric materials and passes the UL 83 vertical flame test. In a flame situation, PVDF tubing resists combustion and does not promote flame spread.

FDA Compliance:

Most PVDF resins qualify for use in contact with food in compliance with FDA regulation 21 CFR 177.1500.

Temperature Ranges:

-20° - 250° F (-29° -121° C) More pressure temperature information is available from the factory upon request.

<i>Tubing Size OD X ID X Wall</i>	<i>Minimum Bend Radius</i>
1/8" X 1/16" X .031	1/2"
1/4" X 1/8" X .062	1/2"
1/4" X 5/32" X .047	3/4"
1/4" X 3/16" X .031	1"
5/16" X 3/16" X .062	1/2"
5/16" X 1/4" X .031	1-3/4"
3/8" X 1/4" X .062	3/4"
3/8" X 5/16" X .031	2-1/2"
1/2" X 3/8" X .062	2-1/2"
1/2" X 7/16" X .031	4"
5/8" X 1/2" X .062	3"
3/4" X 5/8" X .062	6"
3/4" X 11/16" X .032	16"
1" X 7/8" X .062	16"

Part numbers below are for standard configurations. For complete part numbers and options for material, color, packaging, etc. refer to Part Number Matrix on page 4.

Industrial Wall Fractional Tubing

OD	Part Number	OD X ID X Wall	Nominal OD	OD Tolerance	Wall Tolerance	Working PSIG (bar)	Burst PSIG (bar)
1/8"	110-0125031-XXXXXX	1/8" X 1/16" X .031	.125	+/- .004	+/- .003	267 (18.4)	1,348 (92.9)
3/16"	110-0188031-XXXXXX	3/16" X 1/8" X .031	.188	+/- .005	+/- .003	180 (12.4)	908 (62.6)
1/4"	110-0250031-XXXXXX	1/4" X 3/16" X .031	.250	+/- .005	+/- .003	170 (11.7)	685 (47.2)
5/16"	110-0312031-XXXXXX	5/16" X 1/4" X .031	.312	+/- .005	+/- .003	109 (7.5)	550 (37.9)
3/8"	110-0375031-XXXXXX	3/8" X 5/16" X .031	.375	+/- .005	+/- .003	111 (7.6)	459 (31.6)
7/16"	110-0438031-XXXXXX	7/16" X 3/8" X .031	.438	+/- .005	+/- .003	78 (5.4)	394 (27.2)
1/2"	110-0500031-XXXXXX	1/2" X 7/16" X .031	.500	+/- .006	+/- .003	83 (5.7)	345 (23.8)
9/16"	110-0563031-XXXXXX	9/16" X 1/2" X .031	.563	+/- .006	+/- .003	61 (4.2)	307 (21.2)

Heavy Wall Fractional Tubing

OD	Part Number	OD X ID X Wall	Nominal OD	OD Tolerance	Wall Tolerance	Working PSIG (bar)	Burst PSIG (bar)
1/4"	110-0250047-XXXXXX 110-0250062-XXXXXX	1/4" X 5/32" X .047 1/4" X 1/8" X .062	.250	+/- .005	+/- .003	208 (14.3) 330 (22.7)	1,046 (72.1) 1,369 (94.4)
5/16"	110-0312062-XXXXXX	5/16" X 3/16" X .062	.312	+/- .005	+/- .003	219 (15.1)	1,106 (76.3)
3/8"	110-0375062-XXXXXX	3/8" X 1/4" X .062	.375	+/- .005	+/- .003	224 (15.4)	928 (64.0)
1/2"	110-0500062-XXXXXX	1/2" X 3/8" X .062	.500	+/- .005	+/- .003	169 (11.7)	701 (48.3)
5/8"	110-0625062-XXXXXX	5/8" X 1/2" X .062	.625	+/- .006	+/- .003	136 (9.4)	564 (38.9)
3/4"	110-0750062-XXXXXX	3/4" X 5/8" X .062	.750	+/- .006	+/- .003	114 (7.9)	472 (32.5)
1"	110-1000062-XXXXXX	1" X 7/8" X .062	1.000	+/- .010	+/- .003	86 (5.9)	355 (24.5)
1-1/8"	110-1125062-XXXXXX	1-1/8" X 1" X .062	1.125	+/- .015	+/- .003	63 (4.3)	316 (21.8)

Pressures above are for operation at 73°F. Working pressure calculated using a Safety Factor of 5. Note other manufacturers may use a Safety Factor of 4. Fractional tubing is supplied in 25 ft. increments up to 1000 ft. continuous for sizes up to 1" OD. Consult factory for standard packaging on sizes greater than 1" OD. Custom packaging and sizes are quoted upon request.

Metric Tubing

OD	Part Number	OD X ID mm	OD X ID Inch	OD / ID Tolerance mm	OD / ID Tolerance Inch
3	210-0300100-XXXXXX	3.0 X 1.0	.118 X .039	+/- .11	+/- .004
4	210-0400100-XXXXXX	4.0 X 2.0	.157 X .078	+/- .11	+/- .004
5	210-0500100-XXXXXX	5.0 X 3.0	.197 X .118	+/- .11	+/- .004
6	210-0600100-XXXXXX	6.0 X 4.0	.236 X .157	+/- .13	+/- .005
7	210-0700100-XXXXXX	7.0 X 5.0	.276 X .197	+/- .13	+/- .005
8	210-0800100-XXXXXX	8.0 X 6.0	.315 X .236	+/- .13	+/- .005
9	210-0900100-XXXXXX	9.0 X 7.0	.354 X .276	+/- .13	+/- .005
10	210-1000100-XXXXXX	10.0 X 8.0	.393 X .315	+/- .13	+/- .005
12	210-1200100-XXXXXX	12.0 X 10.0	.472 X .393	+/- .15	+/- .006
14	210-1400100-XXXXXX	14.0 X 12.0	.551 X .472	+/- .15	+/- .006

Schedule 40 Pipe

Part Number	Nominal Inch Size	Actual OD Inch	Minimum Wall Inch	OD Tolerance Inch	Wall Tolerance Inch
510-0540088-XXXXXX	1/4"	.540	.088	+/- .010	+0.020 / -.00
510-0840109-XXXXXX	1/2"	.840	.109	+/- .010	+0.020 / -.00
510-1050113-XXXXXX	3/4"	1.050	.113	+/- .010	+0.020 / -.00
510-1315133-XXXXXX	1"	1.315	.133	+/- .015	+0.020 / -.00
510-2375154-XXXXXX	2"	2.375	.154	+/- .015	+0.020 / -.00

Pipe is supplied in 5 and 10 foot straights (i.e. 510-0540088-N50010). Custom packaging, lengths, and schedule 80 pipe are quoted upon request.