Xometry

Datasheet

PVDF

Description

Polyvinylidene fluoride (PVDF), also known as vinylidene fluoride homopolymer, is a highly non-reactive thermoplastic fluoropolymer with a semi-crystalline structure. It offers excellent resistance to aging, chemicals, weathering, and UV radiation.

Features

1. Excellent mechanical properties: It has the highest strength, rigidity, and toughness among fluoroplastics, along with outstanding creep resistance and fatigue resistance.
2. Strong chemical resistance: It resists acids, alkalis, organic solvents, oils, and oxidizers, and is almost impervious to corrosion.
3. Weather and UV resistance: It does not age or become brittle during long-term outdoor use, offering top-tier weather resistance.
4. Heat stability: It can be used continuously at temperatures up to 120 ~ 150℃.
5. Flame retardant & low smoke: It is inherently flame retardant, rated UL94 V-0, with low smoke and low toxicity at high temperatures.
6. Excellent electrical properties: It offers good insulation and stable dielectric constant, making it commonly used in electronics and films.
7. Wear resistance & hydrolysis resistance: It remains stable in hot water and steam environments.
8. Flowability is moderate, requiring higher processing temperatures.

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Parameters

Physical Properties	Metric	English
Density	0.700- 1.88 g/cc	0.0253 - 0.0679 lb/in^3
	1.65- 1.88 g/cc @Temperature 225 - 230 °C	0.0596 - 0.0679 lb/in^3 @Temperature 437 - 446 °F
Water Absorption	0.000 - 0.200 %	0.000 - 0.200 %
Moisture Absorption at Equilibrium	0.000 - 0.0500 %	0.000 - 0.0500 %
Water Absorption at Saturation	0.000 - 0.0500 %	0.000 - 0.0500 %
Particle Size	0.200 - 88.5 µm	0.200 - 88.5 µm
Viscosity	6.00 - 3300 cP	6.00 - 3300 cP
	1200 - 7.80e+6 cP @Temperature 230 - 260 °C	1200 - 7.80e+6 cP @Temperature 446 - 500 °F
	1200 - 7.80e+6 cP @Shear Rate 50.0 - 100 1/s	1200 - 7.80e+6 cP @Shear Rate 50.0 - 100 1/s
Viscosity Test	0.850 - 170 cm^3/g @Temperature 30.0 - 30.0 °C	0.00850 - 1.70 dl/g @Temperature 86.0 - 86.0 °F
Linear Mold Shrinkage	0.00200 - 0.0300 cm/cm	0.00200 - 0.0300 in/in
Melt Flow	0.500 - 40.0 g/10 min	0.500 - 40.0 g/10 min

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Mechanical Properties	Metric	English
Hardness, Rockwell R	62.0--115	62.0--115
Hardness, Shore D	47.0 - 83.0	47.0--83.0
Ball Indentation Hardness	62.0-110 MPa	8990 - 16000 psi
Tensile Strength, Ultimate	13.8-714 MPa	2000 - 104000 psi
Tensile Strength, Yield	5.52-141 MPa	801 - 20500 psi
Elongation at Break	1.00-800%	1.00-800%
Elongation at Yield	2.50 - 40.0 %	2.50 - 40.0 %
Modulus of Elasticity	0.00200-10.2 GPa	0.290 - 1480 ksi
Tenacity	0.371 -0.416 N/tex	4.20 - 4.71 g/denier
Flexural Yield Strength	10.3-207 MPa	1490 - 30000 psi
Flexural Modulus	0.193-8.55 GPa	28.0 - 1240 ksi
Compressive Yield Strength	3.00 - 586 MPa	435 - 85000 psi
Izod Impact, Notched	0.400 - 5340 J/cm	0.749- 10000 ft-lb/in
Izod Impact, Unnotched	2.67 J/cm - NB	5.00 ft-lb/in - NB
Charpy Impact Unnotched	1.60 J/cm^2 - NB 18.6 J/cm^2-NB @Temperature -30.0 - -30.0 °C	7.61 ft-lb/in^2 - NB 88.5 ft-lb/in^2 - NB @Temperature -22.0 - -22.0 °F
Charpy Impact, Notched	0.300 J/cm^2 - NB 0.500-1.10 J/cm^2 @Temperature -30.0 - -30.0 °C	1.43 ft-lb/in^2 - NB 2.38 - 5.24 ft-lb/in^2 @Temperature -22.0 - -22.0 °F
Tensile Impact Strength	140-210 kJ/m^2	66.6 - 99.9 ft-lb/in^2
Coefficient of Friction	0.100--0.540	0.100--0.540
Coefficient of Friction, Static	0.0500 - 0.550	0.0500 - 0.550
Tensile Creep Modulus, 1 hour	508 - 1600 MPa	73700 - 232000 psi
Tensile Creep Modulus, 1000 hours	210 - 950 MPa	30500 - 138000 psi
Taber Abrasion, mg/1000 Cycles	4.00--35.5	4.00 - 35.5