Teflon® PFA 450HP

Perfluoroalkoxy

DuPont Fluoropolymers

Message:

For inventory control purposes product name may be followed by an X.
Products labeled PFA 450HP and PFA 450HP X are equivalent and all information in this document is applicable to both.
Typical Application
Applications for DuPont™ Teflon ® PFA 450HP include tubing, chemical linings for pipes, valves, and fittings used in the chemical processing industries, unsupported pipe linings for the production of ultra-pure chemicals, semiconductor components, and fluid handling components for high-performance chemical delivery systems where purity in the parts-per-billion range is needed. Teflon ® PFA 450HP is preferred in applications where extended service is required in hostile environments involving chemical, thermal, and mechanical stress.
Description
DuPont™ Teflon ® PFA 450HP is a special purpose fluoroplastic resin available in pellet form. This resin is a chemically modified form of Teflon ® PFA 350 that combines many of the benefits of the parent resin (highest resistance to environmental stress-cracking with a typical MIT folding endurance of 500,000*) with several additional benefits including enhanced purity, improved thermal stability while processing, and chemical inertness; for example, to ozonated fluids. Table 1 shows the typical property data for Teflon ® PFA 450HP.
Teflon ® PFA 450HP is a relatively low melt flow rate (typical MFR of 2), premium resin with the lowest level of extractables designed to meet ultra-high purity requirements. An enhanced resistance to environmental stress-cracking makes Teflon ® PFA 450HP a preferred resin when extended service is required in hostile environments involving chemical, thermal, and mechanical stress. Additionally, the enhanced purity of Teflon ® PFA 450 HP makes it suitable for applications that require improved color, lower extractable fluorides, and freedom from other foreign materials. This product contains no additives and is designed for hostile chemical environments where purity in the parts-per-billion range is needed. Examples are in semiconductor manufacture, fluid handling systems for industry or life sciences, and instrumentation for precise measurements of fluid systems. Compared to other thermoplastics, the high melt strength and thermal stability of Teflon ® PFA 450HP can be used to improve processing rates, combining the processing ease of conventional thermoplastics with many properties similar to those of polytetrafluoroethylene.
Properly processed products made from neat Teflon ® PFA 450HP resin provide the superior properties characteristic of fluoroplastic resins: chemical inertness, exceptional dielectric properties, heat resistance, toughness and flexibility, low coefficient of friction, non-stick characteristics, negligible moisture absorption, low flammability, performance at temperature extremes, and excellent weather resistance.
In a flame situation, products of Teflon ® PFA 450HP resist ignition and do not promote flame spread. When ignited by flame from other sources, their contribution of heat is very small and added at a slow rate with very little smoke.
Teflon ® PFA 450HP meets the requirements of ASTM D3307, Type II

General Information	
UL YellowCard	E54681-244683
Features	High purity
	Low friction coefficient
	Low hygroscopicity
	Low smoke
	High ESCR (Stress Cracking Resistance)
	Good electrical performance
	Good melt strength
	Good flexibility
	Low liquidity
	Good chemical resistance
	Good weather resistance
	Heat resistance, medium
	Thermal stability, good
	Good toughness
	Compliance of Food Exposure

Uses	Lining Piping system Pipe fittings Liquid treatment
Agency Ratings	FDA 21 CFR 177.1550 Europe 10/1/2011 12:00:00 AM
Forms	Particle
Processing Method	Blow molding Extrusion Resin transfer molding Compression molding Injection molding

Physical	Nominal Value	Unit	Test Method
Specific Gravity	2.14	g/cm³	ASTM D792
Melt Mass-Flow Rate (MFR) (372°C/5.0 kg)	2.0	g/10 min	ASTM D3307, ISO 12086
Water Absorption (24 hr)	< 0.030	%	ASTM D570
Hardness	**Nominal Value**	**Unit**	**Test Method**
Durometer Hardness (Shore D)	55		ASTM D2240, ISO 868
Mechanical	**Nominal Value**	**Unit**	**Test Method**
Tensile Strength			ASTM D3307, ISO 12086
23°C	28.0	MPa	ASTM D3307, ISO 12086
250°C	14.0	MPa	ASTM D3307, ISO 12086
Tensile Elongation			ASTM D3307, ISO 12086
Fracture, 23°C	300	%	ASTM D3307, ISO 12086
Fracture, 250°C	500	%	ASTM D3307, ISO 12086
Flexural Modulus			ASTM D790, ISO 178
23°C	625	MPa	ASTM D790, ISO 178
250°C	69.0	MPa	ASTM D790, ISO 178
Thermal	**Nominal Value**	**Unit**	**Test Method**
Melting Temperature	305	°C	ASTM D4591
Electrical	**Nominal Value**	**Unit**	**Test Method**
Volume Resistivity	1.0E+18	ohms·cm	ASTM D257, ISO 1325
Dielectric Strength			
0.250 mm [1]	80	kV/mm	ASTM D149
0.250 mm	80	kV/mm	IEC 60243-1
Dielectric Constant (1 MHz)	2.03		ASTM D150, IEC 60250
Dissipation Factor (1 MHz)	< 2.0E-4		ASTM D150, IEC 60250
Flammability	**Nominal Value**	**Unit**	**Test Method**

Flame Rating [2]	V-0		UL 94
Oxygen Index	> 95	%	ASTM D2863, ISO 4589-2

Additional Information	Nominal Value	Unit	Test Method
Critical Shear Rate (372°C)	12.0	sec^-1	
MIT Folding Endurance [3] (200.0 µm)	5.0E+5	Cycles	ASTM D2176
Weather and Chemical Resistance: Outstanding			

NOTE	
1.	Method A (short time)
2.	These results are based on laboratory tests under controlled conditions and do not reflect performance under actual fire conditions, current rating is a typical theoretical value.
3.	Depending on fabrication conditions

Recommended distributors for this material

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