Teflon® PFA 440HPB

Perfluoroalkoxy

DuPont Fluoropolymers

Message:

For inventory control purposes product name may be followed by an X.

Products labeled PFA 440HPB and PFA 440HPB X are equivalent and all information in this document is applicable to both. Typical Application

Applications for DuPont[™] Teflon [®] PFA 440HPB include fluid handling components for critical, high-purity processes like semiconductor, pharmaceutical, and biotechnology, as well as applications where purity in the parts-per-billion range is needed. Teflon [®] PFA 440HPB offers a slightly lower melt flow rate than Teflon [®] PFA 440HPA, ultimately providing a higher degree of stress-crack resistance.

Description

DuPont[™] Teflon [®] PFA 440HPB is a special purpose fluoroplastic resin available in pellet form. This resin is a chemically modified form of Teflon [®] PFA 340 that combines many of the benefits of the parent resin (a relatively high typical melt flow rate of 14) 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 440HPB.

Teflon [®] PFA 440HPB is a premium resin with the lowest level of extractables designed to meet ultra-high purity requirements. Teflon [®] PFA 440HPB has a relatively high melt flow rate for injection molding and extrusion processes, and the highest level of inertness due to stable end group polymer structure. The enhanced purity of Teflon [®] PFA 440HPB 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 440HPB 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 440HPB 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 440HPB 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 440HPB meets the requirements of ASTM D3307, Type I

General Information	
Features	High purity
	Low friction coefficient
	Low hygroscopicity
	Low smoke
	Good electrical performance
	Good melt strength
	Good flexibility
	High liquidity
	Good chemical resistance
	Good weather resistance
	Heat resistance, medium
	Thermal stability, good
	Good toughness
	Compliance of Food Exposure
Uses	Liquid treatment
Agency Ratings	FDA 21 CFR 177.1550

Forms	Particle
Processing Method	Extrusion
	Resin transfer molding
	Compression molding
	Resin transfer molding Compression molding

Injection molding

Physical	Nominal Value	Unit	Test Method
Specific Gravity	2.15	g/cm³	ASTM D792
Melt Mass-Flow Rate (MFR) (372°C/5.0 kg)	14	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	25.0	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	480	%	ASTM D3307, ISO 12086
Flexural Modulus			ASTM D790, ISO 178
23°C	590	MPa	ASTM D790, ISO 178
250°C	55.0	MPa	ASTM D790, ISO 178
Thermal	Nominal Value	Unit	Test Method
Melting Temperature	305	°C	ASTM D4591
Melting Temperature Electrical	305 Nominal Value	°C Unit	ASTM D4591 Test Method
Melting Temperature Electrical Volume Resistivity	305 Nominal Value 1.0E+18	°C Unit ohms·cm	ASTM D4591 Test Method ASTM D257, ISO 1325
Melting Temperature Electrical Volume Resistivity Dielectric Strength	305 Nominal Value 1.0E+18	°C Unit ohms·cm	ASTM D4591 Test Method ASTM D257, ISO 1325
Melting Temperature Electrical Volume Resistivity Dielectric Strength 0.250 mm ¹	305 Nominal Value 1.0E+18 80	°C Unit ohms·cm kV/mm	ASTM D4591 Test Method ASTM D257, ISO 1325 ASTM D149
Melting Temperature Electrical Volume Resistivity Dielectric Strength 0.250 mm 1 0.250 mm	305 Nominal Value 1.0E+18 80 80	°C Unit ohms·cm kV/mm kV/mm	ASTM D4591 Test Method ASTM D257, ISO 1325 ASTM D149 IEC 60243-1
Melting Temperature Electrical Volume Resistivity Dielectric Strength 0.250 mm Dielectric Constant (1 MHz)	305 Nominal Value 1.0E+18 80 80 80 2.03	°C Unit ohms·cm kV/mm kV/mm	ASTM D4591 Test Method ASTM D257, ISO 1325 ASTM D149 IEC 60243-1 ASTM D150, IEC 60250
Melting Temperature Electrical Volume Resistivity Dielectric Strength 0.250 mm Dielectric Constant (1 MHz) Dissipation Factor (1 MHz)	305 Nominal Value 1.0E+18 80 80 2.03 < 2.0E-4	°C Unit ohms·cm kV/mm kV/mm	ASTM D4591 Test Method ASTM D257, ISO 1325 ASTM D149 IEC 60243-1 ASTM D150, IEC 60250 ASTM D150, IEC 60250
Melting Temperature Electrical Volume Resistivity Dielectric Strength 0.250 mm Dielectric Constant (1 MHz) Dissipation Factor (1 MHz) Flammability	305 Nominal Value 1.0E+18 80 80 80 2.03 < 2.0E-4 Nominal Value	°C Unit ohms·cm kV/mm kV/mm Unit	ASTM D4591 Test Method ASTM D257, ISO 1325 ASTM D149 IEC 60243-1 ASTM D150, IEC 60250 ASTM D150, IEC 60250 Test Method
Melting Temperature Electrical Volume Resistivity Dielectric Strength 0.250 mm Dielectric Constant (1 MHz) Dissipation Factor (1 MHz) Flammability Flame Rating ²	305 Nominal Value 1.0E+18 80 80 2.03 < 2.0E-4	°C Unit ohms·cm kV/mm kV/mm Unit	ASTM D4591 Test Method ASTM D257, ISO 1325 ASTM D149 IEC 60243-1 ASTM D150, IEC 60250 ASTM D150, IEC 60250 Test Method UL 94
Melting Temperature Electrical Volume Resistivity Dielectric Strength 0.250 mm Dielectric Constant (1 MHz) Dissipation Factor (1 MHz) Flammability Flame Rating ² Oxygen Index	305 Nominal Value 1.0E+18 80 80 80 2.03 < 2.0E-4 Nominal Value V-0 > 95	°C Unit ohms·cm kV/mm kV/mm Unit	ASTM D4591 Test Method ASTM D257, ISO 1325 ASTM D149 IEC 60243-1 ASTM D150, IEC 60250 ASTM D150, IEC 60250 Test Method UL 94 ASTM D2863, ISO 4589-2
Melting Temperature Electrical Volume Resistivity Dielectric Strength 0.250 mm 0.250 mm Dielectric Constant (1 MHz) Dissipation Factor (1 MHz) Flammability Flame Rating ² Oxygen Index Additional Information	305 Nominal Value 1.0E+18 80 80 2.03 < 2.0E-4	°C Unit ohms∙cm kV/mm kV/mm Unit Unit Unit	ASTM D4591 Test Method ASTM D257, ISO 1325 ASTM D157, ISO 1325 IEC 60243-1 ASTM D150, IEC 60250 ASTM D150, IEC 60250 Test Method UL 94 ASTM D2863, ISO 4589-2 Test Method
Melting Temperature Electrical Volume Resistivity Dielectric Strength 0.250 mm 0.250 mm Dielectric Constant (1 MHz) Dissipation Factor (1 MHz) Flammability Flame Rating ² Oxygen Index Additional Information Critical Shear Rate (372°C)	305 Nominal Value 1.0E+18 80 80 2.03 < 2.0E-4	°C Unit ohms·cm kV/mm kV/mm Unit Unit Unit Sec^-1	ASTM D4591 Test Method ASTM D257, ISO 1325 ASTM D149 IEC 60243-1 ASTM D150, IEC 60250 ASTM D150, IEC 60250 Test Method UL 94 ASTM D2863, ISO 4589-2 Test Method
Melting Temperature Electrical Volume Resistivity Dielectric Strength 0.250 mm Dielectric Constant (1 MHz) Dissipation Factor (1 MHz) Flammability Flame Rating ² Oxygen Index Additional Information Critical Shear Rate (372°C) MIT Folding Endurance ³ (200.0 µm)	305 Nominal Value 1.0E+18 80 80 2.03 < 2.0E-4	°C Unit ohms·cm kV/mm kV/mm Unit Unit Unit Sec^-1 Cycles	ASTM D4591 Test Method ASTM D257, ISO 1325 ASTM D157, ISO 1325 ASTM D149 IEC 60243-1 ASTM D150, IEC 60250 ASTM D150, IEC 60250 Test Method UL 94 ASTM D2863, ISO 4589-2 Test Method ASTM D2863, ISO 4589-2
Melting Temperature Electrical Volume Resistivity Dielectric Strength 0.250 mm 0.250 mm Dielectric Constant (1 MHz) Dissipation Factor (1 MHz) Flammability Flame Rating ² Oxygen Index Additional Information Critical Shear Rate (372°C) MIT Folding Endurance ³ (200.0 µm) Weather and Chemical Resistance: Outstand	305 Nominal Value 1.0E+18 80 80 2.03 < 2.0E-4	°C Unit ohms·cm kV/mm kV/mm Unit Unit % Unit Sec^-1 Cycles	ASTM D4591 Test Method ASTM D257, ISO 1325 ASTM D149 IEC 60243-1 ASTM D150, IEC 60250 ASTM D150, IEC 60250 Test Method UL 94 ASTM D2863, ISO 4589-2 Test Method
Melting Temperature Electrical Volume Resistivity Dielectric Strength 0.250 mm 0.250 mm Dielectric Constant (1 MHz) Dissipation Factor (1 MHz) Flammability Flame Rating ² Oxygen Index Additional Information Critical Shear Rate (372°C) MIT Folding Endurance ³ (200.0 µm) Weather and Chemical Resistance: Outstand NOTE	305 Nominal Value 1.0E+18 80 80 2.03 < 2.0E-4	°C Unit ohms·cm kV/mm kV/mm Unit Unit % Unit Sec^-1 Cycles	ASTM D4591 Test Method ASTM D257, ISO 1325 ASTM D149 IEC 60243-1 ASTM D150, IEC 60250 ASTM D150, IEC 60250 Test Method UL 94 ASTM D2863, ISO 4589-2 Test Method ASTM D2176

	These results are based on laboratory tests under controlled conditions and do not reflect
	performance under actual fire
	conditions, current rating is a
2.	typical theoretical value.
	Depending on fabrication
3.	conditions

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