

Technical Data Sheet

Ultrafuse PPSU

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General information

Components

BASF Polyphenylsulfone (PPSU) based filament for Fused Filament Fabrication.

Product Description

Outstanding thermal stability, good chemical resistance and high strength are the key features of Ultrafuse® PPSU. Parts produced by fused filament fabrication show often mechanical limitations in z-direction - the good layer adhesion of Ultrafuse® PPSU leads to balanced flexural strength properties between z- and x-direction. Ultrafuse® PPSU can be used for functional applications which require a high mechanical strength as well as a high heat distortion temperature – properties, where existing 3D printing materials often show limitations.

Delivery form and warehousing

Ultrafuse® PPSU filament should be stored at 15 - 25°C in its originally sealed package in a clean and dry environment. If the recommended storage conditions are observed the products will have a minimum shelf life of 12 months.

For your information

Ultrafuse® PPSU comes in its natural yellow/brown color. Chemical properties (e.g. resistance against particular substances) and tolerance for solvents can be made available if these factors are relevant for a specific application. Generally, these properties correspond to publicly available data on polysulfones. This material is not FDA conform.

Product safety

Recommended: Process materials in a well ventilated room, or use professional extraction systems. For further and more detailed information please consult the corresponding material safety data sheets.

Notice

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out their own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed.

Recommended 3D-Print processing parameters

Nozzle Temperature	390 – 410 °C / 734 – 770 °F
Build Chamber Temperature	170 – 210 °C / 338 – 410 °F
Bed Temperature	200 – 220 °C / 392 – 428 °F
Bed Material	Glass
Nozzle Diameter	≥ 0.4 mm
Print Speed	25 – 100 mm/s

Drying Recommendations

Drying recommendations to ensure printability	Spools can be dried in a vacuum dryer at 125 °C / 257 °F for 8 hours and should be stored in a closed box during printing. High moisture content is visible by bubbles in the material after the melting process.
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Please note: To ensure constant material properties the material should always be kept dry.

General Properties

		Standard
Printed Part Density	1272 kg/m ³ / 79.4 lb/ft ³	ISO 1183-1

Thermal Properties

		Standard
HDT at 1.8 MPa	211 °C / 411.8 °F	ISO 75-2
HDT at 0.45 MPa	215 °C / 419 °F	ISO 75-2
Vicat softening point at 50 N	217 °C / 422.6 °F	ISO 306
Glass Transition Temperature	222 °C / 431.6 °F	ISO 11357-2
Melt Volume Rate	16.4 cm ³ /10 min / 1.0 in ³ /10 min (360 °C, 5 kg)	ISO 1133
Coefficient of Thermal Expansion	55 E-6/K	ISO 11359-2
Flammability F1 60 sec. vertical	Passed (thickness 1.6 and 6.35 mm)	FAR 25.853 (a)
Flammability F2 12 sec. vertical	Passed (thickness 1.6 and 6.35 mm)	FAR 25.853 (a)
HR Total Heat Release [KW*min/m ²]	Passed (thickness 1.0 and 4.0 mm)	FAR 25.853 (d)
HRRmax Maximum Heat Release Rate [KW/m ²]	Passed (thickness 1.0 mm)	FAR 25.853 (d)
Optical Smoke Density	Passed (thickness 1.0 and 4.5 mm)	FAR 25.853 (d)
Smoke Toxicity	Passed (thickness 1.5 and 4.5 mm)	AITM 3.0005
Flame class rating	V0 @ 1.5 mm and 3.0 mm thickness	UL 94
Glow wire test (GWEPT)	960 °C @ 1.5 mm and 3.0 mm thickness	IEC 60695-2-11

Mechanical Properties



Print direction	Standard	XY	XZ	ZX
		Flat	On its edge	Upright
Tensile strength	ISO 527	74.5 MPa / 10.8 ksi	-	49.0 MPa / 7.1 ksi
Elongation at Break	ISO 527	7.3 %	-	2.9 %
Young's Modulus	ISO 527	2221 MPa / 322.1 ksi	-	2150 MPa / 311.8 ksi
Flexural Strength	ISO 178	105 MPa / 15.2 ksi	114 MPa / 16.5 ksi	88.9 MPa / 12.9 ksi
Flexural Modulus	ISO 178	1940 MPa / 281.4 ksi	1910 MPa / 277.0 ksi	1700 MPa / 246.6 ksi
Flexural Strain at Break	ISO 178	No break	No break	6.8 %
Impact Strength Charpy (notched)	ISO 179-2	21.8 kJ/m ²	15.0 kJ/m ²	5.7 kJ/m ²
Impact Strength Charpy (unnotched)	ISO 179-2	224.8 kJ/m ²	270.5 kJ/m ²	16.3 kJ/m ²
Impact Strength Izod (notched)	ISO 180	13.7 kJ/m ²	15.8 kJ/m ²	5.3 kJ/m ²
Impact Strength Izod (unnotched)	ISO 180	No break	No break	21.0 kJ/m ²

Electrical Properties

Volume resistivity	IEC 62631-3-1	2.6E+15 [Ω cm]	-	-
Surface resistivity	IEC 62631-3-2	4.1E+15 [Ω]	-	-
Dielectric strength (orthogonal)	IEC 60243-1	18.5 [kV/mm]	-	-