

TECAFIL PPSU natural - 1.75 mm - Filament

Chemical Designation

PPSU (Polyphenylsulfone)

Colour

amber transparent

Density

1.29 g/cm³ (*2)

Main features

- high strength
- inherent flame retardant
- good chemical resistance
- good heat deflection temperature
- high thermal and mechanical capacity

Target Industries

- automotive industry
- chemical technology
- mechanical engineering
- aircraft and aerospace interiors
- aircraft and aerospace technology

General material information	parameter	value	unit	norm	comment
Diameter		1,75 +/- 0,05	mm	-	(1) standard spool body
Spool measurements	holder	Ø 52	mm	-	(2) do not dry spool >120°C
Spool measurements	width	55	mm	-	(3) Ø 1,75mm
Spool measurements	outer diameter	Ø 200	mm	-	1)
Spool Material		Polycarbonate		-	2)
Filament Load per Spool		500	g	-	
Filament Length per Spool		152	m	-	3)

Mechanical properties	parameter	value	unit	norm	comment
Tensile strength	5mm/min, Orientation XY	74,4	MPa	DIN EN ISO 527-2	1) (1) (*5), (*6)
Tensile strength	5mm/min, Orientation XZ	71,9	MPa	DIN EN ISO 527-2	2) (2) (*5), (*6)
Tensile strength	5mm/min, Orientation ZX	59,4	MPa	DIN EN ISO 527-2	3) (3) (*5), (*6)
Modulus of elasticity (tensile test)	5mm/min, Orientation XY	2205,0	MPa	DIN EN ISO 527-2	4) (4) (*5), (*6)
Modulus of elasticity (tensile test)	5mm/min, Orientation XZ	2093,0	MPa	DIN EN ISO 527-2	5) (5) (*5), (*6)
Modulus of elasticity (tensile test)	5mm/min, Orientation ZX	2057,0	MPa	DIN EN ISO 527-2	6) (6) (*5), (*6)
Elongation at yield (tensile test)	5mm/min, Orientation XY	7,8	%	DIN EN ISO 527-2	7) (7) (*5), (*6)
Elongation at yield (tensile test)	5mm/min, Orientation XZ	7,9	%	DIN EN ISO 527-2	8) (8) (*5), (*6)
Elongation at yield (tensile test)	5mm/min, Orientation ZX	5,0	%	DIN EN ISO 527-2	9) (9) (*5), (*6)
Elongation at break (tensile test)	5mm/min, Orientation XY	54,0	%	DIN EN ISO 527-2	10) (10) (*5), (*6)
Elongation at break (tensile test)	5mm/min, Orientation XZ	79,2	%	DIN EN ISO 527-2	11) (11) (*5), (*6)
Elongation at break (tensile test)	5mm/min, Orientation ZX	5,0	%	DIN EN ISO 527-2	12) (12) (*5), (*6)
Flexural strength	2mm/min, Orientation XY	91,0	MPa	DIN EN ISO 178	13) (13) (*5), (*6)
Flexural strength	2mm/min, Orientation ZX	85,0	MPa	DIN EN ISO 178	14) (14) (*5), (*6)
Modulus of elasticity (flexural test)	2mm/min, Orientation XY	2050,0	MPa	DIN EN ISO 178	15) (15) (*5), (*6)
Modulus of elasticity (flexural test)	2mm/min, Orientation ZX	1900,0	MPa	DIN EN ISO 178	16) (16) (*5), (*6)
Elongation at break (flexural test)	2mm/min, Orientation XY	no break	%	DIN EN ISO 178	17) (17) (*5), (*6)
Elongation at break (flexural test)	2mm/min, Orientation ZX	5,7	%	DIN EN ISO 178	18) (18) (*5), (*6)

Thermal properties	parameter	value	unit	norm	comment
Glass transition temperature		220	°C	ASTM D 3418	1) (1) (*2)
Melting temperature		-	°C	DIN EN ISO 11357	2) (2) (*2)
Deflection temperature	HDT-A	198	°C	ISO-R 75 Method A	3) (3) (*2)
Service temperature	short term	190	°C	-	4) (4) (*2)
Service temperature	long term	170	°C	-	5) (5) (*2)
Thermal expansion (CLTE)		5,5	10 ⁻⁵ K ⁻¹	DIN EN ISO 11359-1;2	6) (6) (*2)

Other properties	parameter	value	unit	norm	comment
Moisture absorption		0,6	%	DIN EN ISO 62	1) (1) (*2)
Flammability (UL94)	125x13x1,5mm	V0		DIN IEC 60695-11-10;	2) (2) (*2)
Flammability (UL94)	125x13x3mm	V0		DIN IEC 60695-11-10;	3) (3) (*2)
Flammability	60 sec. Vertical Bunsen Burner test, FAR §25.853 (a) and Appendix F, Part I, para. (a)(1)(i)	1,4	mm	FAR 25.853	4) (4) (*5), (*6)
Flammability	12 sec. Vertical Bunsen Burner test, FAR §25.853 (a) and Appendix F, Part I, para. (a)(1)(ii)	1,5	mm	FAR 25.853	5) (5) (*5), (*6)
Flammability	15 sec. Horizontal Bunsen Burner test, FAR §25.853 (a) and Appendix F, Part I, para. (a)(1)(iv)	1,5	mm	FAR 25.853	6) (6) (*5), (*6)
Flammability	Heat Release, as per FAR §25.853 (d) and Appendix F, Part IV	1,5	mm	FAR 25.853	7) (7) (*5), (*6)

Flammability	Smoke density, as per FAR §25.853 (d) and Appendix F, Part V	1,5	mm	FAR 25.853	8)
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Flammability	Gas Toxicity, as per Boeing BSS 7239	1,5	mm	-	9)
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MVR	360°C / 10kg	35	cm ³ /10 min	DIN EN ISO 1133	10)
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<i>Processing parameter</i>	<i>parameter</i>	<i>value</i>	<i>unit</i>	<i>norm</i>	<i>comment</i>
Nozzle temperature		380 - 420	°C	-	(1) required
Max. melt temperature		450	°C	-	
Print bed temperature		160 - 230	°C	-	
Build chamber temperature		160 - 210	°C	-	1)
Nozzle diameter		0,4	mm	-	
Print speed		30 - 40	mm/s	-	
Fan speed		0	%	-	
<i>Pre-drying</i>	<i>parameter</i>	<i>value</i>	<i>unit</i>	<i>norm</i>	<i>comment</i>
Drying temperature		120	°C	-	1) (1) (*4)
Drying time		8	h	-	

→ To achieve optimum mechanical properties, it is recommended to pre-dry the material with the above mentioned parameters.

- (*1) Values measured on injection moulded test specimens
- (*2) Values measured on the raw material
- (*3) The exact parameters depend on the printer used.
- (*4) Do not exceed maximum drying temperature of 120°C
- (*5) Properties tested on printed specimens
- (*6) Specimens printed on Minifactory Ultra

→ The filament should preferably be stored in dry, normal temperature rooms and protected from direct sunlight.

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**Manufactured by: Ensinger Group,
a German based plastic manufacturer**

**Represented by:
Ensinger Asia Holding Pte Ltd.
(Singapore Branch)
for Asia Pacific other than Japan+China**

63 Hillview Avenue #02-03
Lam Soon Industrial Building
Singapore 669569
Tel +65 65524177
Fax +65 65525177
www.ensingerplastics.com/en-sg/

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