

## TECAFIL PPSU natural - 1.75 mm - Filament

### Chemical Designation

PPSU (Polyphenylsulfone)

### Colour

amber transparent

### Density

1.29 g/cm<sup>3</sup> (\*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 (2) do not dry spool >120°C (3) Ø 1,75mm
Spool measurements	holder	Ø 52	mm	-	
Spool measurements	width	55	mm	-	
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	65	MPa	DIN EN ISO 527-2	1) (1) (*5), (*6) (2) (*5), (*6)
Tensile strength	5mm/min, Orientation ZX	59	MPa	DIN EN ISO 527-2	2) (3) (*5), (*6) (4) (*5), (*6)
Modulus of elasticity (tensile test)	5mm/min, Orientation ZX	2060	MPa	DIN EN ISO 527-2	3) (5) (*5), (*6) (6) (*5), (*6)
Modulus of elasticity (tensile test)	5mm/min, Orientation XY	1920	MPa	DIN EN ISO 527-2	4) (7) (*5), (*6) (8) (*5), (*6) (9) (*5), (*6)
Elongation at break (tensile test)	5mm/min, Orientation XY	11,7	%	DIN EN ISO 527-2	5) (10) (*5), (*6)
Elongation at break (tensile test)	5mm/min, Orientation ZX	5,0	%	DIN EN ISO 527-2	6) (11) (*5), (*6) (12) (*5), (*6)
Flexural strength	2mm/min, Orientation XY	91	MPa	DIN EN ISO 178	7)
Flexural strength	2mm/min, Orientation ZX	85	MPa	DIN EN ISO 178	8)
Modulus of elasticity (flexural test)	2mm/min, Orientation XY	2050	MPa	DIN EN ISO 178	9)
Modulus of elasticity (flexural test)	2mm/min, Orientation ZX	1900	MPa	DIN EN ISO 178	10)
Elongation at break (flexural test)	2mm/min, Orientation XY	no break	%	DIN EN ISO 178	11)
Elongation at break (flexural test)	2mm/min, Orientation ZX	5,7	%	DIN EN ISO 178	12)

### 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) (3) (*2)
Deflection temperature	HDT-A	198	°C	ISO-R 75 Method A	3) (4) (*2) (5) (*2) (6) (*2)
Service temperature	short term	190	°C	-	4)
Service temperature	long term	170	°C	-	5)
Thermal expansion (CLTE)		5,5	10 <sup>-5</sup> K <sup>-1</sup>	DIN EN ISO 11359-1;2	6)

### 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) (3) (*2)
Flammability (UL94)	125x13x3mm	V0		DIN IEC 60695-11-10;	3) (4) (*5), (*6) (5) (*5), (*6)
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) (6) (*5), (*6) (7) (*5), (*6) (8) (*5), (*6) (9) (*5), (*6) (10) (*2)
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)
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)
Flammability	Heat Release, as per FAR §25.853 (d) and Appendix F, Part IV	1,5	mm	FAR 25.853	7)
Flammability	Smoke density, as per FAR §25.853 (d) and Appendix F, Part V	1,5	mm	FAR 25.853	8)
Flammability	Gas Toxicity, as per Boeing BSS 7239	1,5	mm	-	9)
MVR	360°C / 10kg	35	cm <sup>3</sup> /10 min	DIN EN ISO 1133	10)
Processing parameter	parameter	value	unit	norm	comment
Nozzle temperature		360 - 400	°C	-	(1) required
Max. melt temperature		410	°C	-	

Print bed temperature	160 - 230	°C	-	
Build chamber temperature	190 - 210	°C	-	1)
Nozzle diameter	0,4	mm	-	
Print speed	30 - 40	mm/s	-	
Fan speed	0	%	-	

Predrying	parameter	value	unit	norm	comment
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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Ensinger GmbH  
Rudolf-Diesel Str. 8  
71154 Nufringen - Deutschland

Tel +49 7032 819 0  
Fax +49 7032 819 100  
[ensingerplastics.com](http://ensingerplastics.com)

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