TECAFIL PPSU natural - 1.75 mm - Filament

Chemical Designation
PPSU (Polyphenylsulfone)

Colour
amber transparent

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

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

Other properties	condition	value	unit	test method		comment
Moisture absorption		0,6	%	DIN EN ISO 62	1)	(1) (*2) (2) (*2) (3) (*2) (4) (*5) , (*6) (5) (*5) , (*6) (6) (*5) , (*6) (7) (*5) , (*6) (8) (*5) , (*6) (9) (*5) , (*6) (10) (*2)
Flammability (UL94)	125x13x1,5mm	V0		DIN IEC 60695-11-10;	2)	
Flammability (UL94)	125x13x3mm	V0		DIN IEC 60695-11-10;	3)	
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)	
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	cm³/10 min	DIN EN ISO 1133	10)	

Processing parameter	*condition*	*value*	*unit*	*test method*		*comment*
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	%	-		

Predrying	*condition*	*value*	*unit*	*test method*		*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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