TECAFIL PPSU MT XRO red - 1.75 mm - Filament

Chemical Designation
PPSU (Polyphenylsulfone)

Colour
red opaque

Density
1.34 g/cm^3 (*2)

Fillers
barium sulfate

Main features
- x-ray opaque
- very good sterilisable
- good chemical resistance
- high gamma radiation resistance
- good heat deflection temperature
- high thermal and mechanical capacity
- hydrolysis and superheated steam resistant

Target Industries
- medical 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		146	m	-	3)	

Mechanical properties	condition	value	unit	test method		comment
Tensile strength	5mm/min, Orientation XY	67,6	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) (19) (*5) , (*6) (20) (*5) , (*6)
Tensile strength	5mm/min, Orientation XZ	71,3	MPa	DIN EN ISO 527-2	2)	
Tensile strength	5mm/min, Orientation ZX	68,5	MPa	DIN EN ISO 527-2	3)	
Modulus of elasticity (tensile test)	5mm/min, Orientation XY	2206,0	MPa	DIN EN ISO 527-2	4)	
Modulus of elasticity (tensile test)	5mm/min, Orientation XZ	2355,0	MPa	DIN EN ISO 527-2	5)	
Modulus of elasticity (tensile test)	5mm/min, Orientation ZX	2311,3	MPa	DIN EN ISO 527-2	6)	
Elongation at yield (tensile test)	5mm/min, Orientation XY	7,4	%	DIN EN ISO 527-2	7)	
Elongation at yield (tensile test)	5mm/min, Orientation XZ	7,4	%	DIN EN ISO 527-2	8)	
Elongation at yield (tensile test)	5mm/min, Orientation ZX	6,6	%	DIN EN ISO 527-2	9)	
Elongation at break (tensile test)	5mm/min, Orientation XY	48,9	%	DIN EN ISO 527-2	10)	
Elongation at break (tensile test)	5mm/min, Orientation XZ	80,7	%	DIN EN ISO 527-2	11)	
Elongation at break (tensile test)	5mm/min, Orientation ZX	7,9	%	DIN EN ISO 527-2	12)	
Elongation at yield (flexural test)	2mm/min, Orientation XY	7,3	%	DIN EN ISO 178	13)	
Elongation at yield (flexural test)	2mm/min, Orientation ZX	7,4	%	DIN EN ISO 178	14)	
Flexural strength	2mm/min, Orientation XY	105,0	MPa	DIN EN ISO 178	15)	
Flexural strength	2mm/min, Orientation ZX	101,0	MPa	DIN EN ISO 178	16)	
Modulus of elasticity (flexural test)	2mm/min, Orientation XY	2300,0	MPa	DIN EN ISO 178	17)	
Modulus of elasticity (flexural test)	2mm/min, Orientation ZX	2130,0	MPa	DIN EN ISO 178	18)	
Elongation at break (flexural test)	2mm/min, Orientation XY	no break	%	DIN EN ISO 178	19)	
Elongation at break (flexural test)	2mm/min, Orientation ZX	no break	%	DIN EN ISO 178	20)	

Thermal properties	condition	value	unit	test method		comment
Glass transition temperature		218	°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	207	°C	ISO-R 75 Method A	3)	
Service temperature	short term	190	°C	-	4)	
Service temperature	long term	170	°C	-	5)	
Thermal expansion (CLTE)		5,6	10^{-5} K^{-1}	DIN EN ISO 11359-1;2	6)	

Other properties	condition	value	unit	test method		comment
Moisture absorption		0,37	%	DIN EN ISO 62	1)	(1) (*2) (2) (*2)
Melt flow index (MFI)	365°C / 5kg	12 - 17	g/10 min	DIN EN ISO 1133	2)	

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	6	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 Kumovis R1

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

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Ensinger Inc. Headquarters 365 Meadowlands Boulevard Washington, PA 15301, USA

Phone 800-243-3221 Sales Phone 800-869-4029
Technical Fax 724-746-9209
sales@ensingerusa.com

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