TECAFIL PEEK LDS black - 1.75 mm - Filament

Chemical Designation
PEEK (Polyetheretherketone)

Colour
black opaque

Density
1.67 g/cm^3 (*2)

Fillers
mineral filler

Main features
- developed for the LPKF-LDS® process

Target Industries
- electronics
- mechanical engineering
- semiconductor technology
- 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		118	m	-	3)	

Mechanical properties	condition	value	unit	test method		comment
Tensile strength	5mm/min, Orientation XY	79,0	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) (*1)
Tensile strength	5mm/min, Orientation XZ	81,3	MPa	DIN EN ISO 527-2	2)	
Tensile strength	5mm/min, Orientation ZX	8,8	MPa	DIN EN ISO 527-2	3)	
Modulus of elasticity (tensile test)	5mm/min, Orientation XY	9694,0	MPa	DIN EN ISO 527-2	4)	
Modulus of elasticity (tensile test)	5mm/min, Orientation XZ	9896,0	MPa	DIN EN ISO 527-2	5)	
Modulus of elasticity (tensile test)	5mm/min, Orientation ZX	2317,3	MPa	DIN EN ISO 527-2	6)	
Elongation at yield (tensile test)	5mm/min, Orientation XY	1,4	%	DIN EN ISO 527-2	7)	
Elongation at yield (tensile test)	5mm/min, Orientation XZ	1,8	%	DIN EN ISO 527-2	8)	
Elongation at yield (tensile test)	5mm/min, Orientation ZX	0,3	%	DIN EN ISO 527-2	9)	
Elongation at break (tensile test)	5mm/min, Orientation XY	1,4	%	DIN EN ISO 527-2	10)	
Elongation at break (tensile test)	5mm/min, Orientation XZ	1,9	%	DIN EN ISO 527-2	11)	
Elongation at break (tensile test)	5mm/min, Orientation ZX	0,3	%	DIN EN ISO 527-2	12)	
Impact strength (Charpy)	max. 7,5J - 23°C	35,0	kJ/m^2	DIN EN ISO 179-1eU	13)	

Thermal properties	condition	value	unit	test method		comment
Glass transition temperature		143	°C	ASTM D 3418	1)	(1) (*2) (2) (*2) (3) (*2) (4) (*2) (5) (*2) (6) (*2) (7) (*2) (8) (*2) (9) (*2) (10) (*2) (11) (*2) (12) (*2) (13) (*2)
Melting temperature		343	°C	DIN EN ISO 11357	2)	
Deflection temperature	HDT-A	204	°C	ISO-R 75 Method A	3)	
Service temperature	short term	300	°C	-	4)	
Service temperature	long term	260	°C	-	5)	
Thermal expansion (CLTE)	longitudinal (at 23 - 100 °C)	18	10^{-6} K^{-1}	DIN EN ISO 11359-1;2	6)	
Thermal expansion (CLTE)	transverse (at 23 - 100 °C)	26	10^{-6} K^{-1}	DIN EN ISO 11359-1;2	7)	
Thermal expansion (CLTE)	longitudinal (at 200 - 260 °C)	46	10^{-6} K^{-1}	DIN EN ISO 11359-1;2	8)	
Thermal expansion (CLTE)	transverse (at 200 - 260 °C)	67	10^{-6} K^{-1}	DIN EN ISO 11359-1;2	9)	
Thermal expansion (CLTE)	longitudinal (at 260 - 300 °C)	63	10^{-6} K^{-1}	DIN EN ISO 11359-1;2	10)	
Thermal expansion (CLTE)	transverse (at 260 - 300 °C)	88	10^{-6} K^{-1}	DIN EN ISO 11359-1;2	11)	
Thermal diffusivity	through-plane	0,29	mm^2/s	DIN EN 821	12)	
Thermal diffusivity	in-plane	0,84	mm^2/s	DIN EN 821	13)	

Electrical properties	condition	value	unit	test method		comment
volume resistance		5,8 x 10^{11}	Ω	DIN EN 61340-2-3	1)	(1) (*2) (2) (*2) (3) (*2) (4) (*2) (5) (*2) (6) (*2)
Dielectric strength	70mm x 70mm x 3mm	17,5	kV/mm	ISO 60243-1	2)	
Dielectric loss factor	test frequency of 1 kHz	0,0066		DIN 53483-1	3)	
Dielectric constant	test frequency of 1 kHz	3,73		DIN 53483-1	4)	
Surface resistivity		5,8 x 10^{12}		DIN EN 61340-2-3	5)	
Resistance to tracking (CTI)		225	V	DIN EN 60112	6)	

Other properties	condition	value	unit	test method		comment
Moisture absorption		0,1	%	DIN EN ISO 62	1)	(1) (*2) (2) (*2) (3) (*2) / pull-off-test (4) (*2) (5) (*2) (6) (*2)
Melt flow index (MFI)	380°C / 10kg	77,0	g/10 min	DIN EN ISO 1133	2)	
Adhesive strength (metal path)		19,4	N/mm^2	-	3)	
Laser Marking Parameter	Power	2 - 8	W	-	4)	

Laser Marking Parameter	Frequency	120 - 180	kHz	-	5)	
Laser Marking Parameter	Forward movement	1,8 - 2,4	m/s	-	6)	

Processing parameter	*condition*	*value*	*unit*	*test method*		*comment*
Nozzle temperature		390 - 420	°C	-		(1) required
Max. melt temperature		430	°C	-		
Print bed temperature		160 - 250	°C	-		
Build chamber temperature		160 - 230	°C	-	1)	
Nozzle diameter		0,4	mm	-		
Print speed		20 - 30	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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