

PEEK-OPTIMA™ Wear Performance (MOTIS) (Granules)

General Information

Product Description

High performance biocompatible thermoplastic material, 30% milled pitch carbon fibre reinforced PolyEtherEtherKetone (PEEK), semi crystalline. Granules for injection moulding and extrusion, standard flow, for use in long term human implantation. Colour black.

Typical Application Areas

Milled pitch carbon fiber composite, specifically designed for tribological applications particularly against a hard counterface such as metal or ceramic whilst maintaining lightweight and radiolucent properties.

Suitable for use in long-term implantable medical devices. Excellent sterilisation resistance. As PEEK is hygroscopic, drying before use is recommended. Further information is available upon request.

Material Properties

Physical	Nominal Value	Unit	Test Method
Density (23°C)	1.42	g/cm ³	ISO 1183
Molding Shrinkage			ASTM D955
Flow	0.30	%	
Across Flow	0.70	%	
Water Absorption (Equilibrium, 23°C, 50% RH)	0.50	%	ISO 62
Crystallinity DSC	30.0	%	Internal Method
Mechanical	Nominal Value	Unit	Test Method
Tensile Stress			ISO 527-2
Yield, 23°C ¹	152	MPa	
Yield, 23°C ²	147	MPa	
Yield, 23°C ³	149	MPa	
Yield, 23°C ⁴	145	MPa	
Tensile Strain ⁴ (Break, 23°C)	2.2	%	ISO 527-2
Flexural Modulus			
23°C ¹	11400	MPa	ISO 178
23°C ³	11300	MPa	ISO 178
23°C ⁴	11600	MPa	ISO 178
Flexural Stress			
Yield, 23°C ¹	231	MPa	ISO 178
Yield, 23°C ²	228	MPa	ISO 178
Yield, 23°C ⁴	227	MPa	ISO 178
Compressive Modulus ⁴ (23°C)	12000	MPa	ISO 604
Compressive Stress ⁴ (23°C)	200	MPa	ISO 604
Shear Modulus ⁴ (23°C)	2200	MPa	ISO 15310
Shear Strength ⁴ (23°C)	95.0	MPa	ASTM D732
Poisson's Ratio ⁴ (23°C)	0.41		ASTM D638

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Impact	Nominal Value	Unit	Test Method
Notched Izod Impact Strength			ISO 180
23°C ¹	6.4	kJ/m ²	
23°C ²	6.6	kJ/m ²	
23°C ³	6.2	kJ/m ²	
23°C ⁴	6.7	kJ/m ²	
Hardness	Nominal Value	Unit	Test Method
Rockwell Hardness (M-Scale, 23°C)	104		ISO 2039-2
Thermal	Nominal Value	Unit	Test Method
Glass Transition Temperature (Onset)	140	°C	ISO 11357-2
Melting Temperature	339	°C	ISO 11357-3
CLTE - Flow			ASTM D696
50 to 120°C	8.0E-7	cm/cm/°C	
170 to 220°C	1.5E-6	cm/cm/°C	
Recrystallization Temperature (Peak)	284	°C	ISO 11357-3
Electrical	Nominal Value	Unit	Test Method
Volume Resistivity			ASTM D257
-- ⁵	4.1E+9	ohms·cm	
-- ⁶	2.1E+9	ohms·cm	
Fill Analysis	Nominal Value	Unit	Test Method
Melt Viscosity 1000 s ⁻¹ (400°C)	730	Pa·s	Internal Method

Typical Processing Information

Injection	Nominal Value	Unit
Drying Temperature	120 to 150	°C
Drying Time	3.0 to 5.0	hr
Suggested Max Moisture	0.020	%
Hopper Temperature	< 100	°C
Rear Temperature	375	°C
Middle Temperature	380 to 385	°C
Front Temperature	390	°C
Nozzle Temperature	395	°C
Mould Temperature	180 to 210	°C

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Injection Notes

Drying Temperature / Time: 150°C / 3h or 120°C / 5h (residual moisture <0.02%)

Runner: Die / Nozzle >3 mm, Manifold >3.5 mm

Gate: >2 mm or 0.5 x part thickness

Important Notes:

1) Processing conditions quoted in our datasheets are typical of those used in our processing laboratories

- Data for mould shrinkage should be used for material comparison. Actual mould shrinkage values are highly dependent on part geometry, mould configuration, and processing conditions.
- Mould shrinkage differs for along flow and across flow directions. "Along flow" direction is taken as the direction the molten material is travelling when it exits the gate and enters the mould.
- Mould shrinkage is expressed as a percent change in dimension of a specimen in relation to mould dimensions.

2) Data are generated in accordance with prevailing national, international and internal standards, and should be used for material comparison.

Actual property values are highly dependent on part geometry, mould configuration and processing conditions. Properties may also differ for along flow and across flow directions.

Storage Requirements

Store in original packaging away from direct sunlight and extremes of temperatures. Do not use if sealing tab is broken prior to opening.

Development Material

During qualification activities NFHI (Not For Human Implantation) grades are available upon request.

Detailed data available on our website www.invibio.com or upon request.

Notes

¹ 1-Cycle EtO

² 3-Cycles Steam

³ 75 kGy Gamma

⁴ As Moulded

⁵ 0.5 V

⁶ 1.0 V

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