

PBI (POLYBENZIMIDAZOLE) MATERIAL DATA SHEET

- Extremely high maximum allowable service temperature in air (310°C continuously, going up to 500°C for short periods of time)
- Excellent retention of mechanical strength, stiffness and creep resistance over a wide temperature range
- Excellent wear & frictional behavior
- Extremely low coefficient of linear thermal expansion
- Excellent resistance against high energy radiation (gamma- and X-rays)
- Inherent low flammability
- High purity in terms of ionic contamination
- Good electrical insulating and dielectric properties

Applications: High heat insulator bushings, electrical connectors, ball valve seats, clamp rings, light bulb contact parts.

PROPERTIES	Test methods	Units	VALUES
Colour	-	-	black
Density	ISO 1183-1	g/cm ³	1.30
Water absorption:			
- after 24/96 h immersion in water of 23°C	ISO 62	mg	38 / -
	ISO 62	%	0.50 / -
- at saturation in air of 23°C / 50% RH	-	%	7.5
- at saturation in water of 23°C	-	%	14
Thermal Properties			
Melting temperature (DSC, 10°C/min)	ISO 11357-1/-3	°C	NA
Glass transition temperature (DSC, 20°C/min)	ISO 11357-1/-2	°C	425
Thermal conductivity at 23°C	-	W/(K.m)	0.40
Coefficient of linear thermal expansion:			
- average value between 23 and 100°C	-	m/(m.K)	25 x 10 ⁻⁶
- average value between 23 and 150°C	-	m/(m.K)	25 x 10 ⁻⁶
- average value above 150°C	-	m/(m.K)	25 x 10 ⁻⁶
Temperature of deflection under load:			
- method A: 1.8 MPa	ISO 75-1/-2	°C	425
Max. allowable service temperature in air:			
- for short periods (3)	-	°C	500
- continuously : for min. 20,000 h	-	°C	310
Min. service temperature	-	°C	-50
Flammability:			
- "Oxygen Index"	ISO 4589-1/-2	%	58
- according to UL 94 (1.5 / 3 mm thickness)	-	-	V-0 / V-0
Mechanical Properties at 23°C			
Tension test:			
- tensile stress at yield / tensile stress at break	ISO 527-1/-2	MPa	NYP / 130
- tensile strength	ISO 527-1/-2	MPa	130
- tensile strain at break	ISO 527-1/-2	%	3
- tensile modulus of elasticity	ISO 527-1/-2	MPa	5800
Compression test:			
- compressive stress at 1 / 2 % nominal strain	ISO 604	MPa	49 / 96
Charpy impact strength - unnotched	ISO 179-1/1eU	kJ/m ²	-
Charpy impact strength - notched	ISO 179-1/1eA	kJ/m ²	3.5
Ball indentation hardness	ISO 2039-1	N/mm ²	375
Rockwell hardness	ISO 2039-2	-	E 120
Electrical Properties at 23 °C			
Electric strength	IEC 60243-1	kV/mm	22
Volume resistivity	IEC 60093	Ohm.cm	> 10 ¹⁴
Surface resistivity	ANSI/ESD STM 11.11	Ohm/sq.	> 10 ¹³
Relative permittivity εr: - at 100 Hz	IEC 60250	-	3.3
- at 1 MHz	IEC 60250	-	3.2
Dielectric dissipation factor tan δ: - at 100 Hz	IEC 60250	-	0.001
- at 1 MHz	IEC 60250	-	-
Comparative tracking index (CTI)-	IEC 60112-	-	-

Note: 1 g/cm³ = 1,000 kg/m³ ; 1 MPa = 1 N/mm² ; 1 kV/mm = 1 MV/m.NA: not applicableNYP: there is no yield point

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