

CELAZOLE PBI offers the highest temperature resistance and best mechanical property retention of all unfilled thermoplastics. Thanks to its unique property profile, CELAZOLE PBI might bring the ultimate solution when no other plastics material can. It is a very appealing material to high-tech industries such as semiconductor, aircraft and aerospace industries.

Physical properties (indicative values*)

| PROPERTIES | Test methods ISO/(IEC) | Units | VALUES |
|--|------------------------|-------------------|---------------------|
| Colour | — | — | black |
| Density | 1183 | g/cm ³ | 1.30 |
| Water absorption: | | | |
| - after 24 h immersion in water of 23°C (1) | 62 | mg | 38 |
| | 62 | % | 0.50 |
| - at saturation in water of 23°C | — | % | 14 |
| Thermal Properties | | | |
| Melting temperature | — | °C | NA |
| Glass transition temperature | — | °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) | 25·10 ⁻⁶ |
| - average value between 23 and 150°C | — | m/(m·K) | 25·10 ⁻⁶ |
| - average value above 150°C | — | m/(m·K) | 25·10 ⁻⁶ |
| Temperature of deflection under load: | | | |
| - method A: 1.8 MPa | 75 | °C | 425 |
| Max. allowable service temperature in air: | | | |
| - for short periods (2) | — | °C | 600 |
| - continuously: for min. 20,000h (3) | — | °C | 310 |
| Flammability (4): | | | |
| - "Oxygen index" | 4589 | % | 58 |
| - according to UL 94 (1.5/3 mm thickness) | — | — | V-0/V-0 |
| Mechanical Properties at 23°C | | | |
| Tension test (5): | | | |
| - tensile stress at break (6) | 527 | MPa | 140 |
| - tensile strain at break (6) | 527 | % | 3 |
| - tensile modulus of elasticity (7) | 527 | MPa | 5,800 |
| Compression test (8): | | | |
| - compressive stress at 1% nominal strain (7) | 604 | MPa | 42 |
| - compressive stress at 2% nominal strain (7) | 604 | MPa | 82 |
| Charpy impact strength - Notched | 179/1eA | kJ/m ² | 3.5 |
| Ball indentation hardness (9) | 2039-1 | N/mm ² | 375 |
| Rockwell hardness (9) | 2039-2 | — | E 105 |
| Electrical Properties at 23°C | | | |
| Electric strength (10) | (60243) | kV/mm | 22 |
| Volume resistivity | (60093) | Ω·cm | > 10 ¹⁴ |
| Surface resistivity | (60093) | Ω | > 10 ¹³ |
| Relative permittivity ε_r : | | | |
| - at 100 Hz | (60250) | — | 3.3 |
| - at 1 MHz | (60250) | — | 3.2 |
| Dielectric dissipation factor tan δ : - at 100 Hz | | | |
| | (60250) | — | 0.001 |

Legend

- (1) According to method 1 of ISO 62 and done on discs Ø 50x 3mm.
- (2) Only for short time exposure (a few hours) in applications where no or only a very low load is applied to the material.
- (3) Temperature resistance over a period of min. 20,000 hours. After this period of time, there is a decrease in tensile strength of about 50% as compared with the original value. The temperature value given here is thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties. Note, however, that the maximum allowable service temperature depends in many cases essentially on the duration and the magnitude of the mechanical stresses to which the material is subjected.
- (4) These mostly estimated ratings, derived from raw material supplier data, are not intended to reflect hazards presented by the materials under actual fire conditions. There is no UL yellow card available for CELAZOLE PBI stock shapes.
- (5) Test specimens: Type 1 B.
- (6) Test speed: 5 mm/min.
- (7) Test speed: 1 mm/min.
- (8) Test specimens: cylinders Ø 12 x 30 mm.
- (9) 10 mm thick test specimens.
- (10) 1 mm thick test specimens.

• This table is a valuable help in the choice of a material. The data listed here fall within the normal range of product properties of dry material. **However, they are not guaranteed and they should not be used to establish material specification limits nor used alone as the basis of design.**

Note: 1 g/cm³ = 1,000 kg/m³; 1 MPa = 1 N/mm²; 1 kV/mm = 1 MV/m

NA: not applicable

Availability

Round Rods: Ø 9.53-101.60 mm - **Plates:** Thicknesses 12.70-38.10 mm - **Tubes:** O.D. 42.86-138.11 mm

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