

## Celazole® PBI (Polybenzimidazole)

Celazole® PBI offers excellent mechanical properties above 400° F (205° C). Celazole® is ideal for high heat bushings, connectors and valve seats. Celazole® is extremely hard and can offer a challenge to fabricate. It is an unfilled plastic that offers excellent heat resistance and mechanical property retention over 400°F (205°C). It has better wear resistance and load-carrying capabilities at extreme temperatures than most reinforced or unreinforced advanced engineering plastic.

As an unreinforced material, Celazole® PBI is very "clean" in terms of ionic impurity and it does not outgas (except water). These characteristics make this material very attractive to semiconductor manufacturers for vacuum chamber applications. Celazole® PBI has excellent ultrasonic transparency, which makes it an ideal choice for parts such as probe tip lenses in ultrasonic measuring equipment. Celazole® PBI is also an excellent thermal insulator. Other plastics in melt do not stick to PBI. These characteristics make it ideal for contact seals and insulator bushings in plastic production and molding equipment.

| Property                           | ASTM Test Method            | Units   | Celazole® PBI |
|------------------------------------|-----------------------------|---|---------------|
| <b>Physical</b>                    |                             |   |               |
| Specific Gravity                   | D792                        |   | 1.3           |
| Water Absorption Immersion, 24 hr. | D570                        | %   | 0.4           |
| Water Absorption Immersion, Sat    | D570                        | %   | 5             |
| <b>Mechanical</b>                  |                             |   |               |
| Tensile Strength                   | D638                        | psi   | 20,000        |
| Tensile Modulus                    | D638                        | psi   | 850,000       |
| Elongation                         | D638                        | %   | 3             |
| Flexural Strength                  | D790                        | psi   | 32,000        |
| Flexural Modulus                   | D790                        | psi   | 950,000       |
| Compressive Strength               | D695, 10% Def.              | psi   | 50,000        |
| Compressive Modulus                | D695                        | psi   | 900,000       |
| Hardness, Rockwell E               | D785                        |   | 105           |
| Hardness, Rockwell M               | D785                        |   | 125           |
| Hardness, Durometer, Shore D Scale | D2240                       |   | 94            |
| Izod Impact (Notched)              | D256 Type A                 | ft-lb/in  | 0.5           |
| Coefficient of Friction, Dynamic   | Dry vs. Steel, PTM55007     |   | 0.24          |
| Limiting PV                        | PTM55007                    | psi-fpm   | 37500         |
| k (wear) factor                    | PTM55007                    | 10 <sup>-10</sup> in <sup>3</sup> -min/lb-ft-hr | 60            |
| <b>Thermal</b>                     |                             |   |               |
| Coefficient of Thermal Expansion   | E831 (TMA)                  | 10E-4/°F  | 0.13          |
| Deflection Temperature, 264 psi    | D648                        | °F  | 800           |
| Tg-Glass Transition (Amorphous)    | D3418                       | °F  | 750           |
| Continuous Service in Air (Max)    | Without Load                | °F  | 600           |
| Thermal Conductivity               |                             | BTU-in/hr-ft <sup>2</sup> -°F                   | 2.8           |
| Flammability                       | UL94                        |   | V-0           |
| <b>Electrical</b>                  |                             |   |               |
| Dielectric Strength, Short Term    | D149 (2)                    | Volts/mil                                       | 550           |
| Surface Resistance, Ohm/Square     | Lower Limit; EOS/ESD S11.11 |   | 1E+13         |
| Dielectric Constant, 1 MHz         | D150 (2)                    |   | 3.2           |
| Dissipation Factor, 1 MHz          | D150 (2)                    |   | 0.003         |

*NOTE: The information contained herein are typical values intended for reference and comparison purposes only. They should NOT be used as a basis for design specifications or quality control. Contact us for manufacturers' complete material property datasheets. All values at 73°F (23°C) unless otherwise noted.*