CELAZOLE® PBI

PRODUCT PROFILE

BEST MECHANICAL PROPERTIES TO 800°F (425°C)

- **Highest mechanical properties of any plastic above 400°F (204°C)**
- **Highest heat deflection temperature 800°F (427°C), with a continuous service capability of 750°F (399°C) in inert environments, or 650°F (343°C) in air with short term exposure potential to 1,000°F (538°C)**
- **Lowest coefficient of thermal expansion and highest compressive strength of all unfilled plastics**

CELAZOLE® PBI

Celazole® PBI is the highest performance engineering thermoplastic available today. It offers the highest heat resistance and mechanical property retention over 400°F of any unfilled plastic (see Figures 30 & 31). It has better wear resistance and load carrying capabilities at extreme temperatures than any other reinforced or unreinforced 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.

Fig. 30 - **COMPARATIVE TENSILE STRENGTH VS. TEMPERATURE**

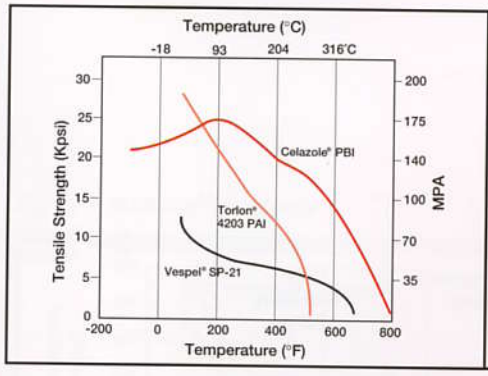
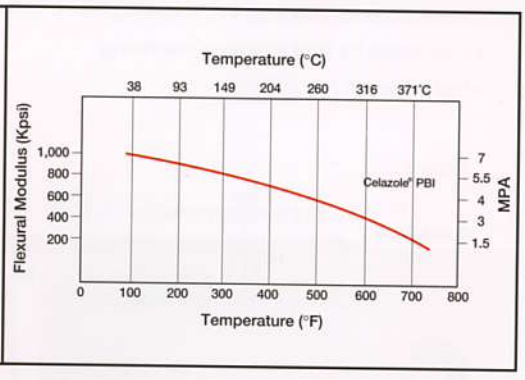


Fig. 31 - **FLEXURAL MODULUS VS. TEMPERATURE**



PRODUCT APPLICATION:

Vacuum Cups

- **Problem:** *Engineers were looking for a more cost-effective solution for an extremely high temperature glass handling application.*
- **Solution:** *Celazole PBI outperformed prior materials and reduced the component cost.*
- **Benefits:** *Celazole is more wear resistant than polyimides. - The Celazole PBI cups reduced product breakage compared to the ceramics tested. - Celazole PBI was more cost effective than pressed carbon or polyimide materials.*

PRODUCT APPLICATION:

High heat insulator bushings

- **Problem:** *Hot runner systems needed a material that could endure the high temperatures but did not "stick" to the finish molded parts.*
- **Solution:** *Celazole PBI machined bushings outperformed al other materials tested in the application.*
- **Benefits:** *Celazole PBI is unique in its ease of clean up in hot runner systems. Molded parts do not stick to Celazole during their "freeze" cycle in the mold.*

Tech Notes:

Celazole PBI is extremely hard and can be challenging to fabricate. Polycrystalline diamond tools are recommended when fabricating production quantities. Celazole tends to be notch sensitive. All corners should be radiused (0.040" min.) and edges chamfered to maximize part toughness. High tolerance fabricated components should be stored in sealed containers (usually polybags with desiccant) to avoid dimensional changes due to moisture absorption. Components rapidly exposed to temperatures above 400°F (205°C) should be "dried" prior to use or kept dry to avoid deformation from thermal shock.