



## **Celazole<sup>®</sup> PBI Compression Molded Shapes Manufactured by Polymics, Ltd.**

Polybenzimidazole (PBI) offers the highest performance of any engineering plastic and is ideally suited for use in the most extreme engineering applications. At temperatures of over 400°F (205C), PBI exhibits the highest strength and stiffness of any unfilled plastic. For short durations, this material can withstand temperatures as high as 800°F (427C) and because it does not melt or burn, brief exposure to 1400°F (760C).



### ***Other Benefits offered by Celazole<sup>®</sup> PBI:***

- Highest Compressive Strength of any unfilled thermoplastic
- High Strength with low hysteresis losses and high elastic recovery
- Very Low coefficient of thermal expansion
- Outstanding wear resistance
- Very good resistance to chemicals, plasma, and steam
- Excellent thermal and electrical insulator
- Superior ablative properties
- Very low ionic impurities and does not outgas

***Celazole<sup>®</sup> PBI stock shapes manufactured by Polymics, Ltd. provide engineers in technology oriented industries with an incredibly strong, light weight, and wear resistant option to metals.***

To meet the wide ranging needs of machinists and fabricators, *Celazole<sup>®</sup> PBI* stock shapes are offered by Polymics in an expansive array of compression molded shapes and sizes. Polymics' offerings include plates in sizes from 5" x 10" to 10.5" x 15" and thicknesses from 1/4" all the way to 2", rods in diameters from 1/4" to 5" in lengths up to 15" long and tubular bars and discs with outer diameters up to 15".

Polymics, Ltd. is the world's premier developer and manufacturer of ultra-high performance engineering plastics for an infinite variety of engineered end uses. We are a technology focused company that offers a truly unique combination of expertise in product development, application engineering, and innovative polymer processing. Polymics' capabilities include the synthesis and polymerization of custom materials, material testing, resin compounding, compression molding, injection molding, and fabrication of finished components. Polymics, Ltd. has the expertise and manufacturing capabilities to provide end users with one stop "problem to finished part" solutions. Polymics, Ltd., offers its products to customers in the western hemisphere through its sales and manufacturing location in State College, PA and to customers in Asia/Pacific through its Applied Polymer Materials, Inc. subsidiary near Taipei, Taiwan.

Polymics, Ltd.  
2215 High Tech Road  
State College, PA 16803 USA  
Tele: (814)357-5860  
Fax: (814)357-5863  
www.polymics.com

Applied Polymer Materials, Inc.  
#1006, Guangfu Road  
Bade City, Taoyuan, 33455  
Taiwan, R.O.C.  
Tel:886-3-367-1357  
Fax:886-3-377-1908  
www.polymics.com



# Celazole<sup>®</sup> PBI Compression Molded Shapes

## Physical Property Datasheet

| Property                                    | ASTM  | US Value                         | SI Unit    |
|---|-------|----------------------------------|------------|
| <b>Mechanical</b>                           |       |                                  |            |
| Tensile Strength @ Break                    | D638  | 21 Kpsi                          | 145 MPa    |
| Tensile Modulus                             | D638  | 0.85 Mpsi                        | 5.9 GPa    |
| Elongation @ Break                          | D638  | 3 %                              |            |
| Flexural Strength                           | D790  | 32 Kpsi                          | 220 MPa    |
| Flexural Modulus                            | D790  | 0.95 Mpsi                        | 6.5 GPa    |
| Compressive Strength @ Yield                | D790  | 57 Kpsi                          | 390 MPa    |
| Compressive Modulus                         | D790  | 0.85 Mpsi                        | 5.9 GPa    |
| Izod, Notched @ 1/8"                        | D256  | 0.53 ft-lb/in                    | 30 J/cm    |
| Hardness, Rockwell E/M Scale                | D785  | 104 / >125                       |            |
| Hardness, Shore D                           | D2240 | 95                               |            |
| <b>Thermal</b>                              |       |                                  |            |
| Glass Transition Temperature - Tg           | DMA   | 800 °F                           | 427°C      |
| Heat Deflection Temperature @ 264psi/1.8MPa | D648  | 815 °F                           | 435°C      |
| Coef. of Linear Thermal Expansion           |       |                                  |            |
| 75°F – 300°F / 25°C – 150°C                 | TMA   | 13 µin/in-°F                     | 23 µm/m-°C |
| 390°F – 570°F / 200°C – 200°C               | TMA   | 18 µin/in-°F                     | 33 µm/m-°C |
| Thermal Conductivity                        | F433  | 2.8 BTU-in/hr-ft <sup>2</sup> °F | 0.41W/m°C  |
| <b>Electrical</b>                           |       |                                  |            |
| Dielectric Strength – Short Term            | D149  | 580 V/mil                        | 23KV/mm    |
| Dissipation Factor @ 10 <sup>6</sup> Hz     | D150  | 0.003                            |            |
| Volume Resistivity                          | D257  | 2 x 10 <sup>15</sup> Ohm-cm      |            |
| Dielectric Constant @ 10 <sup>6</sup> Hz    | D150  | 3.2                              |            |
| <b>General</b>                              |       |                                  |            |
| Density                                     | D792  | 1.3 lb/in <sup>3</sup>           | 1.3 g/ml   |
| Color                                       |       | Dark Brown/Black                 |            |
| Moisture Absorption @ 24hr.                 | D570  | 0.4%                             |            |
| Limiting Oxygen Index                       | D2863 | 58%                              |            |
| Flammability @ 1/8" (estimated)             | UL 94 | V-0                              |            |

Unless otherwise noted, All values are at 73°F/20°C.

We believe that this all statements, technical information, and recommendations contained in this document are the best available on the subject at the time of publication. Polymics, Ltd. makes no guarantee as to the accuracy of this information and assumes no liability whatsoever in connection with the use of this information or the materials described in it. It is the user's responsibility to assure the suitability of materials for any application. Statements containing possible suggested uses of the materials described herein are not to be construed as a license to operate under, or intended to suggest infringement of any existing patent.

Celazole<sup>®</sup> is a registered trademark of PBI Performance Products, Inc.