



GR9810™

June 2009

**PRODUCT DESCRIPTION**

GR9810™ provides the following product characteristics:

|                                    |                                                                                                                                      |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>Technology</b>                  | Epoxy                                                                                                                                |
| <b>Appearance</b>                  | Black                                                                                                                                |
| <b>Cure</b>                        | Heat cure                                                                                                                            |
| <b>Product Benefits</b>            | <ul style="list-style-type: none"> <li>• Low warpage</li> <li>• Thermally stable at 260°C reflow</li> <li>• Green product</li> </ul> |
| <b>Filler Type</b>                 | Silica                                                                                                                               |
| <b>Filler Weight, %</b>            | 85                                                                                                                                   |
| <b>Typical Package Application</b> | SIP and Flip Chip BGA                                                                                                                |
| <b>Application</b>                 | Molding compound                                                                                                                     |
| <b>Flammability</b>                | 94 V-0                                                                                                                               |
| <b>Flame Retardant</b>             | Hydrophobic nitrogen                                                                                                                 |

Hysol®GR9810™ is a technologically advanced epoxy molding compound designed for use as an overmold on a wide variety of conventionally underfilled packages.

**TYPICAL PROPERTIES OF UNCURED MATERIAL**

|                            |     |
|----------------------------|-----|
| Particle Size, µm, maximum | 75  |
| Gel Time @ 177 °C, seconds | 24  |
| Spiral Flow, @ 175°C, cm   | 100 |
| Shelf Life:                |     |
| @ 5°C, months              | 3   |
| @ -18°C, months            | 12  |

**TYPICAL PROCESS DATA****Handling**

|                            |            |
|----------------------------|------------|
| Preheat Temperature :      |            |
| Automold, seconds          | 0 to 3     |
| Molding Temperature, °C    | 155 to 175 |
| Molding Pressure, Kg/cm²   | 30 to 60   |
| Transfer Time:             |            |
| Conventional mold, seconds | 15 to 20   |
| Automold, seconds          | 3 to 6     |
| Curing Time, 3 mm section: |            |
| Conventional mold:         |            |
| @ 165°C, seconds           | 90 to 120  |
| @ 175°C, seconds           | 70 to 90   |
| Automold:                  |            |
| @ 165°C, seconds           | 90 to 120  |
| @ 175°C, seconds           | 50 to 70   |
| Post Cure @ 175°C, hours   | 2 to 6     |

GR9810™ has been formulated to provide the best possible moldability and as wide a molding latitude as possible. Although molding and curing conditions will vary from situation to situation, recommended starting ranges are shown above.

**TYPICAL PROPERTIES OF CURED MATERIAL**

All measurements taken at 25 °C unless otherwise noted. All physical, electrical and analytical measurements taken on specimens cured for 2 minutes@ 175°C with post cure of 6 hours at 175 °C, unless other wise specified.

**Physical Properties:**

|                                              |                     |
|----------------------------------------------|---------------------|
| Coefficient of Thermal Expansion, cm/°C :    |                     |
| Below Tg                                     | 10×10 <sup>-6</sup> |
| Above Tg                                     | 35×10 <sup>-6</sup> |
| Glass Transition Temperature (Tg) by TMA, °C | 200                 |
| Specific Gravity                             | 2.01                |
| Molded shrinkage, as molded, %               | 0.1                 |
| Flexural Strength Kg/mm² :                   |                     |
| @ 25 °C                                      | 12                  |
| @ 220 °C                                     | 1.7                 |
| Flexural Modulus Kg/mm² :                    |                     |
| @ 25 °C                                      | 2,300               |
| @ 220 °C                                     | 260                 |
| Thermal Conductivity, W/mK                   | 1.04                |

**GENERAL INFORMATION**

**For safe handling information on this product, consult the Material Safety Data Sheet, (MSDS).**

**Not for product specifications**

The technical data contained herein are intended as reference only. Please contact your local quality department for assistance and recommendations on specifications for this product.

**Storage**

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

**Optimal Storage: 5°C. Storage greater than or below 5°C can adversely affect product properties.**

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Center or Customer Service Representative.



## Conversions

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$   
 $\text{kV/mm} \times 25.4 = \text{V/mil}$   
 $\text{mm} / 25.4 = \text{inches}$   
 $\text{N} \times 0.225 = \text{lb}$   
 $\text{N/mm} \times 5.71 = \text{lb/in}$   
 $\text{N/mm}^2 \times 145 = \text{psi}$   
 $\text{MPa} \times 145 = \text{psi}$   
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$   
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$   
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$   
 $\text{mPa}\cdot\text{s} = \text{cP}$

## Note

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Reference 0.0