

## Preliminary Product Information Sheet

*(Note: These are typical properties to be used as a guide only, not a specification. Data below is not guaranteed. Different batches, conditions and applications yield differing results.)*

**MATERIAL ID:** **EPO-TEK® ED1020 (formerly 77-189)**  
**Date:** 05/2009 **Per:**  
**Rev:** IV

**Material Description:** A single component, silver-filled epoxy designed for low power semiconductor LED die attach applications. Its unique features include excellent adhesion and stress relief through mechanical reliability testing. Other attributes include long pot-life, low viscosity and high thixotropy making it ideal for a wide range of application methods including wafer level stamping and syringe dispensing.

**Number of Components:** Single

**Mix Ratio by weight:** N/A

**Cure Schedule (minimum):** 150°C/1 Hour

**Specific Gravity:** 2.89      ---      Part A:                      Part B:

**Pot Life:** 28 Days

**Shelf Life:** One year at -40°C

*NOTE:* Container(s) should be kept closed when not in use. Filled systems should be stirred thoroughly before mixing and prior to use.

### MATERIAL CHARACTERISTICS:

| <b>PHYSICAL PROPERTIES:</b>                    |   |                                    |                   |
|--|---|------------------------------------|-------------------|
| <b>Color (before cure):</b>                    | Silver  | <b>Degradation Temp:</b>           | 333 °C            |
| <b>Consistency:</b>                            | Smooth thixotropic paste  | <b>Weight Loss:</b>                |                   |
| <b>Viscosity (23°C):</b>                       |   | @ 200°C:                           | 0.68 %            |
| @ 1 rpm  | 28,583 cPs  | @ 250°C:                           | 1.24 %            |
| @ 10 rpm                                       | 9,569 cPs   | @ 300°C:                           | 1.71 %            |
| @ 100 rpm                                      | 1,479 cPs   | <b>Operating Temp:</b>             |                   |
| <b>Thixotropic Index:</b>                      | 3.0   | <b>Continuous:</b>                 | - 55°C to + 150°C |
| <b>Glass Transition Temp:</b>                  | ≥ 46 °C (Dynamic Cure<br>20—200°C /ISO 25 Min; Ramp -10—200°C @ 20°C/Min) | <b>Intermittent:</b>               | - 55°C to + 250°C |
| <b>Coefficient of Thermal Expansion (CTE):</b> |   | <b>Storage Modulus @ 23°C:</b>     | 36103 psi         |
| <b>Below Tg:</b>                               | 45 x 10 <sup>-6</sup> in/in°C   | <b>Ion Content:</b>                |                   |
| <b>Above Tg:</b>                               | 181 x 10 <sup>-6</sup> in/in°C  | <b>Cl<sup>-</sup>:</b>             | 169 ppm           |
| <b>Shore D Hardness:</b>                       | 40  | <b>NH<sub>4</sub><sup>+</sup>:</b> | 67 ppm            |
| <b>Lap Shear @ 23°C:</b>                       |   | <b>Na<sup>+</sup>:</b>             | 0 ppm             |
| <b>Die Shear @ 23°C:</b>                       |   | <b>K<sup>+</sup>:</b>              | 4 ppm             |
| <b>Initial</b>                                 | 15.4 Kg   | <b>Particle Size:</b>              | < 20 microns      |
| <b>After 1000hrs 85°C/85%RH</b>                | 9.3 Kg  |                                    |                   |
| <b>ELECTRICAL AND THERMAL PROPERTIES:</b>      |   |                                    |                   |
| <b>Thermal Conductivity:</b>                   | 1.88 W/mK   | <b>Dielectric Constant (1KHz):</b> | N/A               |
| <b>Volume Resistivity @ 23°C:</b>              | ≤ 0.0004 Ohm-cm   | <b>Dissipation Factor (1KHz):</b>  | N/A               |
| <b>OPTICAL PROPERTIES @ 23°C:</b>              |   |                                    |                   |
| <b>Spectral Transmission:</b>                  | N/A   | <b>Index of Refraction:</b>        | N/A               |

The data above is INITIAL only - it may be changed at anytime, for any reason without notice to anyone. It is provided only as a guide for evaluation/consideration.

\*These material characteristics are typical properties that are based on a limited number of samples/batches. All properties are based on the cure indicated above. Some properties may vary as manufactured quantities are scaled up to commercialized production levels.