



# LOCTITE® 3534™

December 2006

## PRODUCT DESCRIPTION

LOCTITE® 3534™ provides the following product characteristics:

|                             |                                    |
|-----------------------------|------------------------------------|
| <b>Technology</b>           | Epoxy                              |
| <b>Chemical Type</b>        | Epoxy                              |
| <b>Appearance (uncured)</b> | Dark red paste <sup>LMS</sup>      |
| <b>Components</b>           | One component - requires no mixing |
| <b>Cure</b>                 | Heat cure                          |
| <b>Application</b>          | Encapsulation                      |
| <b>Dispense Method</b>      | Syringe                            |
| <b>Key Substrates</b>       | SMD components to PCB              |

LOCTITE® 3534™ is a high purity liquid epoxy designed for use as a glob top for chip-on-board applications. This product exhibits minimum slumping and its rheology is designed to provide controlled flow to encapsulate electronic devices as well as to penetrate through the wire leads. LOCTITE® 3534™ is easily dispensed, minimizes induced stress, provides improved temperature cycling performance and has excellent chemical resistance. Particularly suited for diodes, sensors, ASICs, PCMCIA, power modules and multi-chip modules where potting indentations are not provided.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

|                                                      |                                  |
|------------------------------------------------------|----------------------------------|
| Specific Gravity @ 25 °C                             | 1.76                             |
| Filler Content, %                                    | 68                               |
| Particle Size, µm                                    | 25                               |
| Casson Viscosity, 25 °C, mPa·s (cP):                 |                                  |
| Cone and plate rheometer                             | 27,000 to 70,000 <sup>LMS</sup>  |
| Viscosity, Cone & Plate, mPa·s (cP):                 |                                  |
| Temperature: 25 °C, Shear Rate: 5 s <sup>-1</sup>    | 60,000 to 110,000 <sup>LMS</sup> |
| Temperature: 25 °C, Shear Rate: 20 s <sup>-1</sup>   | 52,000 to 93,000 <sup>LMS</sup>  |
| Extrusion Rate, g/min:                               |                                  |
| Pressure 0.14 MPa, time 1 minute, temperature 25 °C: |                                  |
| 18 Gauge Needle                                      | 0.07 to 0.21 <sup>LMS</sup>      |
| Pressure 0.62 MPa, time 1 minute, temperature 25 °C: |                                  |
| 18 Gauge Needle                                      | 0.3 to 0.82 <sup>LMS</sup>       |
| Flash Point - See MSDS                               |                                  |

## TYPICAL CURING PERFORMANCE

Recommended conditions for curing are exposure to heat above 100°C (typically 30 - 60 minutes @ 150°C). Rate of cure and final strength will depend on the residence time at the cure temperature.

## TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 60 minutes at 150 °C

### Physical Properties:

|                                                                  |                         |
|------------------------------------------------------------------|-------------------------|
| Coefficient of Thermal Expansion, ISO 11359-2, K <sup>-1</sup> : |                         |
| Temperature Range 25°C to 100°C                                  | 20×10 <sup>-6</sup>     |
| Temperature Range 160°C to 240°C                                 | 72×10 <sup>-6</sup>     |
| Tensile Strength, ISO 527-3                                      | N/mm <sup>2</sup> 46    |
|                                                                  | (psi) (6,700)           |
| Tensile Modulus, ISO 527-3                                       | N/mm <sup>2</sup> 6,067 |
|                                                                  | (psi) (880,000)         |
| Elongation, ISO 527-3, %                                         | 1                       |
| Glass Transition Temperature, ISO 11357-2, °C                    | 139                     |

Extractable Ionic Content, MIL 883 E, , µg/g:

|                       |                    |
|-----------------------|--------------------|
| Hydrolyzable Chloride | ≤10 <sup>LMS</sup> |
| Chloride              | <10                |
| Potassium             | <5                 |
| Sodium                | <5                 |

## TYPICAL PERFORMANCE OF CURED MATERIAL

Cured for 30 minutes @ 150 °C

Lap Shear Strength, ISO 4587:

|                               |                       |
|-------------------------------|-----------------------|
| Epoxy FR4 to Epoxy-Fiberglass | N/mm <sup>2</sup> 5.5 |
|                               | (psi) (800)           |

Cured for 30 minutes @ 150 °C, tested @ 22 °C

Lap Shear Strength, ISO 4587:

G-10 Epoxy:

|            |                                      |
|------------|--------------------------------------|
| 0.5 mm gap | N/mm <sup>2</sup> ≥11 <sup>LMS</sup> |
|            | (psi) (≥1,595)                       |

## GENERAL INFORMATION

**This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.**

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

## Directions for use

1. Frozen packages must be completely thawed before use. Warm at room temperature until thawed. **Do not thaw in an oven or water bath.**
2. LOCTITE® 3534™ is supplied de-aerated in a range of ready-to-use syringes which fit straight into a variety of air pressure/time dispensing systems commonly available.
3. After storage in a refrigerator the adhesive must be allowed to equilibrate to room temperature before use, typically 24 hours.
4. Avoid cross contamination with other epoxy or acrylic adhesives by ensuring dispense nozzels, adapters etc. are thoroughly cleaned.
5. Do not leave dirty nozzles on dispensing equipment while not in use or soaking in solvents for long periods of time.
6. The quantity of adhesive dispensed will depend on the dispense pressure, time, nozzle size and temperature.
7. These parameters will vary depending on the type of dispensing system used and should be optimised accordingly.
8. For best results, the product should be dispensed onto a substrate warmed to approximately 90°C. This will help to minimize air entrapment under bonding wires.
9. The absorption of ambient moisture (humidity) can result in a degradation of desired ultimate cured properties. White swirls in the uncured product or a glossy surface on the cured product indicates moisture absorption. A black surface on the cured product is the desired final appearance.

**Storage**

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

**Products must be stored in a dry location in unopened containers at or below a temperature of -40 °C.** 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.

**Loctite Material Specification<sup>LMS</sup>**

LMS dated May 04, 2000. Test reports for each batch are available for the indicated properties. LMS test reports include selected QC test parameters considered appropriate to specifications for customer use. Additionally, comprehensive controls are in place to assure product quality and consistency. Special customer specification requirements may be coordinated through Henkel Quality.

**Note**

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**Conversions**

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

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Reference 0.0