



# 3500™

February 2009

## PRODUCT DESCRIPTION

3500™ 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>• Snap curable</li> <li>• Fast flow without substrate pre-heat</li> <li>• Low temperature cure</li> <li>• Dissipates stress on solder joints</li> <li>• Reworkable</li> </ul>
<b>Application</b>	Underfill
<b>Typical Assembly Applications</b>	Reworkable CSP/BGA

3500™ underfill cures quickly at low temperature to minimize thermal stress to other components and provide rapid device throughput. When cured, it provides excellent protection for solder joints against mechanical stress, such as shock, drop, and vibration common in hand-held devices. The material is also reworkable, allowing for an expanded process window and recovery of high-cost substrates and PWBs.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

Viscosity, Brookfield CP52/20, 25 °C, mPa·s (cP) 203

Work Life @ 25°C, days 14

Shelf Life @ 2°C, months

Specific Gravity 1.13

Flash Point - See MSDS

## TYPICAL CURING PERFORMANCE

### Cure Schedule

2 minutes @ 130°C

With all fast cure systems, the minimum required time for cure depends on the rate of heating. Cure rates depend on the mass of material to be heated and intimate contact with the heat source. Use suggested cure conditions as general guidelines. Other cure conditions may yield satisfactory results. The above cure profiles are guideline recommendations. Cure conditions (time and temperature) may vary based on customers' experience and their application requirements, as well as customer curing equipment, oven loading and actual oven temperatures.

## TYPICAL PROPERTIES OF CURED MATERIAL

### Physical Properties:

(Cured 60 minutes @ 120°C)

Coefficient of Thermal Expansion cm/cm/°C:

Below Tg	77×10 <sup>-6</sup>
Above Tg	215×10 <sup>-6</sup>

Glass Transition Temperature (Tg) by TMA, °C	16
Storage Modulus, 25°C, GPa	1.9

## GENERAL INFORMATION

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

### THAWING:

1. Allow container to reach room temperature before use.
2. After removing from the freezer, set the syringes to stand vertically while thawing.
3. Syringes should thaw a minimum of 60 minutes.

### Removal Procedure

1. Heat the underfill approximately 240°C using a hot air nozzle on standard BGA rework equipment.
2. Component can be twisted and removed.
3. Clean and remove residue using a tacky flux or liquid flux and a solder removal vacuum tool.

### 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: 2 to 8°C. Storage below 2°C or greater than 8°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

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

## Trademark usage

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 0.0