



3323

July 2010

PRODUCT DESCRIPTION

3323 provides the following product characteristics:

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|----------------------|--|
| Technology | Epoxy |
| Appearance (uncured) | Smooth grey paste |
| Appearance (cured) | Translucent grey |
| Viscosity | High, thixotropic |
| Components | One component - requires no mixing |
| Cure | Ultraviolet (UV) light |
| Application | Encapsulant - dam |
| Specific Application | Wire bonded dies used for Smartcard ICs |
| Specific Benefit | Low coefficient of thermal expansion. High adhesion to a wide range of substrates normally used as carrier plastics, e.g., glass epoxy, polyimide and polyester. |

3323 has been developed for encapsulation of wire bonded dies, used for Smartcard IC modules. It is designed for use only with Hysol UV fill encapsulants, such as 3327 and 3329. Either combination of dam and fill will pass mechanical stress testing and high reliability tests; typically thermal shock cycling -55 °C to +125 °C and humidity heat aging 85 °C / 85 % RH.

TYPICAL PROPERTIES OF UNCURED MATERIAL

| | |
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| Specific Gravity @ 25 °C | 1.44 |
| Casson Yield Point, 25 °C, Pa | 240 |
| Casson Viscosity @ 25 °C, mPa·s (cP): | |
| Cone & Plate Rheometer | 3,000 |
| Viscosity, Cone & Plate, mPa·s (cP): | |
| Temperature: 25 °C, Shear Rate: 20 s ⁻¹ | 19,000 to 36,000 |
| Filler Content, % | 43 |
| Filler Particle Size, ISO 13220-1, D95, µm | ≤32 |
| Flash Point - See MSDS | |

TYPICAL CURING PERFORMANCE

3323 is cured when exposed to UV-A radiation of wavelength of 310 to 365 nm. The speed and depth of cure will depend on the UV intensity measured at the product surface. Typical cure condition is 26 to 46 seconds at 100 mW/cm² using a medium pressure, quartz envelope, mercury vapour UV lamp (e.g. UVALOC 1000). Allow longer time when surfaces are black or dark coloured. 3323 has been formulated to minimize shrinkage for minimum tape warpage and water uptake.

Tack Free Time

Tack Free Time is the time in seconds the product must be irradiated with light energy to form a tack free surface.

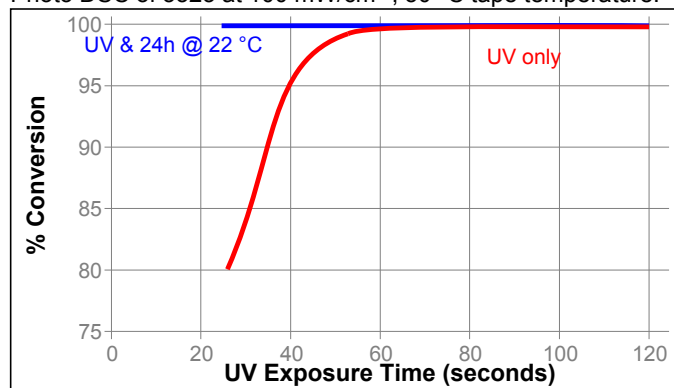
| | |
|---|----|
| Tack Free Time, seconds | |
| 100 mW/cm ² , measured @ 365 nm, | ≤7 |

Depth of Cure

UV Depth of Cure, mm
 30 seconds @ 100 mW/cm² , measured @ 365 nm ≥1.8

Cure by Photo DSC

The following graph shows the percentage conversion by Photo DSC of 3323 at 100 mW/cm² , 50 °C tape temperature.



TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 100 mW/cm² measured @ 365 nm, for 30 seconds using a medium pressure, quartz envelope, mercury vapour lamp

Physical Properties:

| | |
|---|----------------------|
| Coefficient of Thermal Expansion ISO 11359-2, K ⁻¹ : | |
| alpha 1 | 45×10 ⁻⁶ |
| alpha 2 | 130×10 ⁻⁶ |
| Glass Transition Temperature, ISO 6721-1, °C | 140 |
| Shore Hardness, ISO 868, Durometer D | 85 |
| Extractable Ionic Content, MIL-STD-883 Method 5011, µg/g: | |
| Fluoride | <400 |
| Chloride | <10 |
| Sodium | <10 |
| Tensile Modulus, ISO 6721-5, DMTA , GPa: | |
| @ 25 °C | 1.7 |
| @ 125 °C | 1.0 |
| Water Absorption, ASTM D 570 , %: | |
| 24 hours in deionized water @ 25 °C | 2.0 |

GENERAL INFORMATION

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

Directions for use

1. Remove product from refrigeration and allow to reach ambient temperature before use.
2. This product is UV sensitive. Exposure to daylight, UV light and artificial lighting should be kept to a minimum during storage and handling. Product should be dispensed by applicator equipment suitable for use with UV products. All product reservoirs and feed lines should be impermeable to UV light.



3. For best performance bond surfaces should be clean and free from grease.
4. UV cure rate is dependent on lamp intensity, distance from light source, depth of cure needed or bondline gap and light transmission of the substrate through which the radiation must pass. If filters are in place to block light and heat then this should be considered in the determination of cure times.
5. Detailed process settings for dispensing and UV cure process are available on request from our technical service centers.

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

The product is light sensitive and accordingly, translucent containers should be kept in a dark place when not in use. Store product in the unopened container in a dry location. Storage information may also be indicated on the product container labelling.

Optimal Storage: 2 °C 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 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.

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Reference 1.4