# LOCTITE®

# 3619™

July 2008

## PRODUCT DESCRIPTION

3619™ provides the following product characteristics:

| | |
|---|---|
| **Technology** | Epoxy |
| Chemical Type | Epoxy |
| Appearance (uncured) | Red high viscosity paste[LMS] |
| Components | One component - requires no mixing |
| **Cure** | Heat cure |
| **Application** | Surface mount adhesive |
| Key Substrates | SMD components to PCB |
| Dispense Method | Syringe |
| Dispense Speed | High 25,000 - 40,000 dots/h |
| Wet Strength | High |

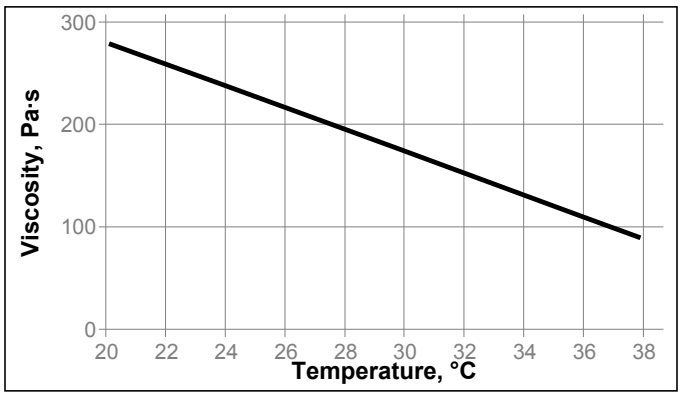
3619™ is designed for the bonding of surface mounted devices to printed circuit boards prior to wave soldering. Particularly suited where low curing temperatures are required with heat sensitive components, and in applications where short curing times are required.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

| | |
|---|---|
| Specific Gravity @ 25 °C | 1.22 |
| Yield Point, 25 °C, Pa | 200 to 450[LMS] |
| Cone & Plate Rheometer: | |
| Haake PK 100, M10/PK 1 2° Cone | |
| Casson Viscosity @ 25 °C, Pa·s | 1 to 4 |
| Cone & Plate Rheometer: | |
| Haake PK 100, M10/PK 1 2° Cone | |
| Particle Size, µm | <100 |
| Flash Point - See MSDS | |

## VISCOSITY VS. TEMPERATURE

The following graph shows a typical temperature-viscosity curve as measured using a Haake rotoviscometer PK100, M10/PK1 2° Cone system at a shear rate of 2 $s^{-1}$ which is representative of the shear rate in the dispense nozzle. Increased cabin or nozzle temperature in the 30°C to 35°C range may aid dispense performance at higher dispense speeds.

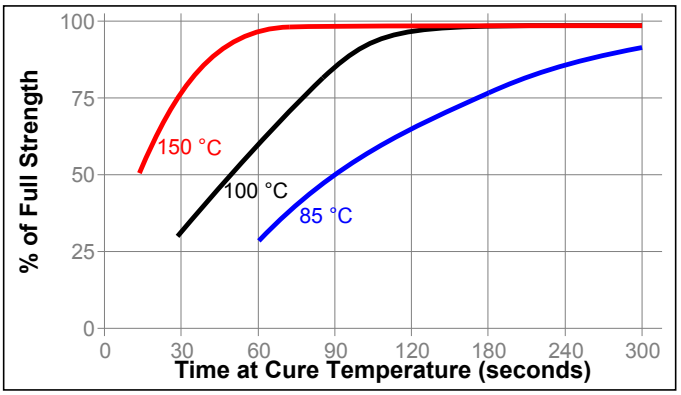



## TYPICAL CURING PERFORMANCE

Recommended conditions for curing are exposure to heat above 100°C (typically 90 to 120 seconds @ 100 °C). Rate of cure and final strength will depend on the residence time at the cure temperature.

## Cure Speed vs. Time, Temperature

The following graph shows the rate of torque strength developed with time at different temperatures. These times are defined from the moment the adhesive reaches cure temperature. In practice, total oven time may be longer to allow for heat up period. Strength is measured on 1206 capacitors @ 22 °C, tested according to IPC SM817, TM-650 Method 2.4.42.




## Isothermal DSC Conversion

| | |
|---|---|
| 3 minutes @ 90 °C, % | ≥70[LMS] |

## TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 30 minutes @ 100 °C

| | |
|---|---|
| **Physical Properties**: | |
| Coefficient of Thermal Expansion, ISO 11359-2, $K^{-1}$: | |
| Temperature Range: -30 °C to +30 °C | 60 |
| Temperature Range: 70 °C to 150 °C | 120 |
| Density, BS 5350-B1 @ 25 °C, g/cm³ | 1.3 |
| Glass Transition Temperature, ASTM D 4065, °C | 50 |
| **Electrical Properties**: | |
| Volume Resistivity, IEC 60093, Ω·cm | $1.2\times10^{15}$ |
| Surface Resistivity, IEC 60093, Ω | $19\times10^{15}$ |
| Electrolytic Corrosion, DIN 53489 | A - 1 |
| Dielectric Breakdown Strength, IEC 60243-1, kV/mm | 30 |
| Dielectric Constant / Dissipation Factor, IEC 60250: | |
| 1 kHz | 3.24 / 0.02 |
| 100 kHz | 3.05 / 0.03 |
| 1,000 kHz | 2.89 / 0.04 |
| 10,000 kHz | 2.75 / 0.05 |
| Surface Insulation Resistance, Ω: | |
| IPC TM 650 2.6.3.1: | |
| Test Board: IPC-B-25A, comb pattern D: | |
| Initial | $200\times10^{9}$ |
| Aged for 7 days @ 50 °C, 90 % RH | $550\times10^{9}$ |

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## TYPICAL PERFORMANCE OF CURED MATERIAL

### Adhesive Properties

Cured for 90 seconds @ 100 °C

Push-off Strength:

| | | |
|---|---|---|
| C-1206 on bare FR4 board | N | ≥25[LMS] |
| | (lb) | (≥5.6) |

Cured for 5 minutes @ 100 °C

Torque Strength, IPC SM817 , TM-650 Method 2.4.42:

| | | |
|---|---|---|
| C-1206 on bare FR4 board | N·mm | 50 |
| | (in.oz) | (7) |

Pull-off Strength, Siemens norm SN59651:

| | | |
|---|---|---|
| C-1206 on bare FR4 board | N | 50 |
| | (lb) | (11) |

Cured for 30 minutes @ 100 °C

Lap Shear Strength, ISO 4587:

| | | |
|---|---|---|
| Steel (grit blasted) | N/mm² | ≥14[LMS] |
| | (psi) | (≥2,030) |

Bond strength achieved in practice will vary considerably depending on the SMD component type, adhesive dot size and the type, grade and degree of cure of the solder mask/resist.

## TYPICAL ENVIRONMENTAL RESISTANCE

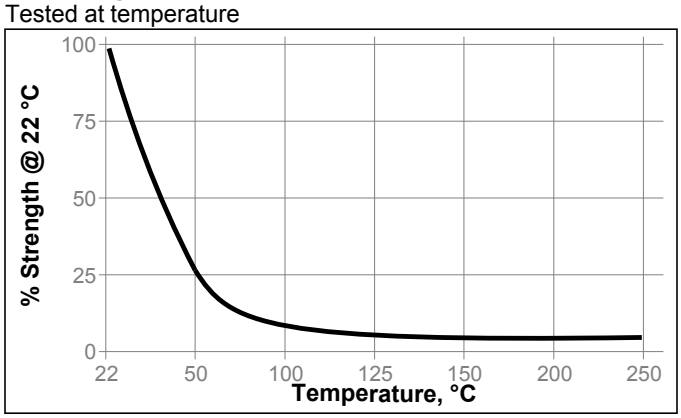
Cured for 30 minutes @ 100 °C

Lap Shear Strength, ISO 4587:

Mild steel (grit blasted)

### Hot Strength

Tested at temperature




### Resistance to Hot Solder Dip

Cured for 90 seconds @ 150 °C

Hot Solder Dip, IPC SM817, TM-650 Method 2.4.42.1, Pass/Fail:

R-1206 on bare FR4 board:

| | |
|---|---|
| Supported 60 seconds above solder bath @ 260°C and dipped for 10 seconds | Pass |

## GENERAL INFORMATION

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

### Directions for use:

1. 3619™ 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.
2. After storage in a refrigerator the adhesive must be allowed to equilibrate to room temperature before use, typically 2 to 4 hours.
3. Avoid cross contamination with other adhesive residues by ensuring dispense nozzels, adapters etc. are thoroughly cleaned.
4. Do not leave dirty nozzles on dispensing equipment while not in use or soaking in solvents for long periods of time.
5. The quantity of adhesive dispensed will depend on the dispense pressure, time, nozzle size and temperature.
6. These parameters will vary depending on the type of dispensing system used and should be optimised accordingly.
7. Dispensing temperature should ideally be controlled at a value between 30 °C to 35 °C for optimum results, however higher dispense temperatures are possible.
8. 3619™ can also be dispensed using positive displacement pump systems.
9. The product is not recommended for dispensing by pin transfer.
10. Uncured adhesive can be cleaned from the board with isopropanol, MEK or ester blends such as LOCTITE® 7360™.

### Loctite Material Specification[LMS]

LMS dated August 31, 1999. 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.

### Storage

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

**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 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

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
µm / 25.4 = mil
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

**Note**

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Reference 1.2