LOCTITE®

3880™

March 2009

PRODUCT DESCRIPTION

3880™ provides the following product characteristics:

Technology	Epoxy
Chemical Type	Epoxy
Appearance (uncured)	Silver paste[LMS]
Appearance (cured)	Silver solid[LMS]
Components	One component - requires no mixing
Cure	Heat cure
Application	Conductive adhesive
Key Substrates	Electronic components
Other Application Areas	Thermal conduction
Dispense Method	Syringe and Stencil print

3880™ is designed for bonding of metals, ceramics, rubbers and plastics as used in electronic parts, where good adhesion combined with electrical and thermal conductivity is required. Typical applications include bonding surface mount devices to flexible or rigid substrates, bonding of semiconductor elements, joining EMI parts, bonding electrodes, lead wires or other connectors that require conductivity.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	2.4
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 14, speed 5 rpm	50,000 to 150,000[LMS]
, with small sample adaptor	
VOC, ASTM D 3960, g/l	74
Moisture Content, ASTM D 4017, %	<0.01
Total Volatile Content, ASTM D 2369, %	3.0
Flash Point - See MSDS	

TYPICAL CURING PERFORMANCE

Recommended Curing Conditions

10 minutes @ 125 °C

6 minutes @ 150 °C

3 minutes @ 175 °C

Note: Sufficient time must be added to allow the bond location to reach the desired cure temperature. Alternate cure profiles may be evaluated.

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}:		
Pre Tg		45
Post Tg		220
Glass Transition Temperature, ISO 11359-2, °C:		
(Tg) by TMA		40
Water Absorption, ISO 62, %:		
2 hours in boiling water:		
Increased weight		<5
Soluble matter loss		<1
Water absorbed		<5
24 hours in water @ 22 °C:		
Increased weight		<1
Soluble matter loss		<0.02
Water absorbed		<1
Coefficient of Thermal Conductivity ASTM F 433, W/(m·K)		>2
Extractable Ionic Content, µg/g:		
Chloride		<20
Potassium		<6
Sodium		<6
Fluorine		<6

Cured for 15 minutes @ 130 °C

Electrical Properties:

Volume Resistivity, IEC 60093, Ω·cm	$<0.8\times10^{-3}$ [LMS]

Cured for 1 hour @ 130 °C

Physical Properties:

Volume Shrinkage, ASTM D 792, %		<3
Shore Hardness, ISO 868, Durometer D		78
Elongation, ISO 527-3, %		1.3
Tensile Strength, ISO 527-3	N/mm²	34.5
	(psi)	(5,000)
Tensile Modulus, ISO 527-3	N/mm²	3,100
	(psi)	(450,000)

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 15 minutes @ 130 °C

Lap Shear Strength, ISO 4587:

Epoxyglass :		
0.25 mm gap	N/mm²	2.0
	(psi)	(300)
Aluminum :		
0.25 mm gap	N/mm²	4.1
	(psi)	(600)
Glass :		
0.25 mm gap	N/mm²	2.0
	(psi)	(300)

Cured for 2 hours @ 130 °C

Lap Shear Strength, ISO 4587:

Aluminum (etched & abraded):		
0.127 mm gap	N/mm²	≥4.8[LMS]
	(psi)	(≥696)

Henkel

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. 3880™ 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 the adhesive must be allowed to equilibrate to room temperature before use, typically 24 hours. The product has a typical work life of 7 days if dispensed directly from the syringe package, and one shift (8 to 12 hours) if applied via stencil or screen print.
3. Avoid cross contamination with other epoxy or acrylic adhesives 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. 3880™ 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™.
11. When dispensing either directly from the syringe or through a positive displacement valve, system pressure should typically be between (0.1 and 0.3 MPa). The typical cycle time required to dispense through a 0.4 mm diameter tip ranges from 30 to 100 ms. Continuous extrusion of 0.5 mm diameter beads can be achieved at linear dispense rates of 5 to 50 mm/s (depending on the application).
12. Stencil or screen printing; down to 0.5 mm pitch and 0.25 mm site width can be achieved at speeds up to 25 mm/s (depending on the application).

Loctite Material Specification[LMS]

LMS dated January 15, 2001. 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: 0 °C. Storage below or greater than 0 °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

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

Reference 1.4