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LOCTITE

Technical Data Sheet

LOCTITE 3875

May 2018

PRODUCT DESCRIPTION

LOCTITE 3875 provides the following product characteristics:

Technology	Acrylate
Appearance - Part A	Pale yellow
Appearance - Part B	Pale blue
Components	Two-component
Product Benefits	• Thermally conductive : 2.0 W/m-K • Ease of use
Cure	Room temperature
Application	Thermal management
Typical Assembly Applications	Transistors, Rectifiers, other power devices and computing applications such as memory chips, chipsets and graphic processor assembly

LOCTITE 3875 bead-on-bead, thermally conductive adhesive is designed to thermally couple and structurally bond heats sinks to heat dissipating electronic components. It is formulated to cure when the two components come into contact with one another, requiring no primer or heat.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Part A Properties

Viscosity, mPa·s (cP):	
@ Speed 2.5 rpm	65,000
@ Speed 20 rpm	32,000
Specific Gravity, g/cc	1.7
Flash Point - See SDS	

Part B Properties

Viscosity, mPa·s (cP):	
@ Speed 2.5 rpm	190,000
@ Speed 20 rpm	90,000
Specific Gravity, g/cc	1.7
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE

Fixture Time

3 to 5 minutes @ 23°C

Cure Schedule

24 to 72 hours @ 23°C , 50% RH

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

Coefficient of Thermal Expansion, ppm/°C:	
Alpha 1	54
Alpha 2	141
Glass Transition Temperature (Tg), °C	28
Thermal Conductivity, ASTM D5470, W/(m-K)	1.75

TYPICAL PERFORMANCE OF CURED MATERIAL

Shear Strength

Die Shear Strength:		
6.35 X 6.35 mm (250 x 250 mil) die @ 25°C, kg-f:		
Ni/Cu leadframe		60
Ceramic		63
Silicon		68
Mold Compound		34
Contaminated Mold Compound		22
Tensile Shear Strength:		
Grit blasted steel	N/mm² (psi)	16 (2,400)
Aluminum	N/mm² (psi)	13 (1,900)

TYPICAL ENVIRONMENTAL RESISTANCE

The ability of LOCTITE 3875 to withstand exposure to a number of severe environments was determined by measuring the change in thermal resistance of a standard test piece.

In this these tests, a TO-247 MOSFET was bonded to the subject substrate. The baseline thermal resistance was determined after the material had fully cured.

The numbers referenced below indicated the change in thermal resistance, measured at room temperature, after the test piece had been exposed to the referrenced condition for the alloted time.

Change in Thermal Resistance (% of Change)

Thermal Exposure , 1,000 hours	
@ 25ºC:	
Ceramic	4.5
Silicon	-7.6
Mold Compound	-0.3
Contaminated Mold Compound	4.4
@ 125ºC:	
Ceramic	8.0
Silicon	-3.5
Mold Compound	-0.7
Contaminated Mold Compound	-4.1

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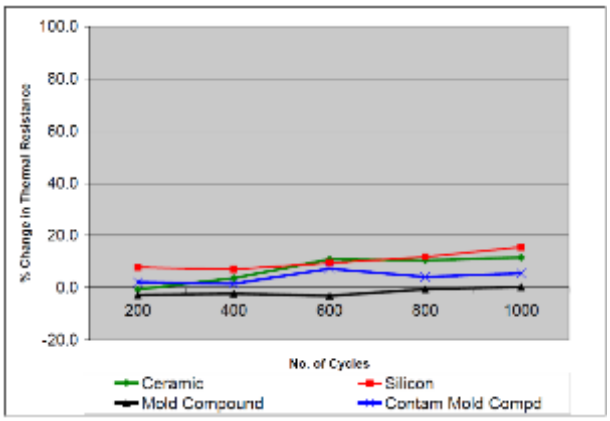
Moisture Resistance , 1,000 hrs @ 85ºC/85% RH	
Ceramic	6.5
Silicon	2.5
Mold Compound	-7.1
Contaminated Mold Compound	0.1

Thermal Shock , 15 cycles @ -50 to +150ºC (5 mins @ high temp + 5 mins @ low temp per cycle)	
Ceramic	2.8
Silicon	0.0
Mold Compound	5.5
Contaminated Mold Compound	3.1

Thermal Cycling , -25 to +125ºC temperature cycle, ramp 10ºC per minute, 10 minute dwell

Profile 1:



GENERAL INFORMATION

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

THAWING:

1. DO NOT open the package before contents reach ambient temperature.
2. A new package of material can be brought to ambient conditions by allowing container to stand at room temperature for 2 hours. Actual time required will vary with package size/volume.
3. DO NOT attempt to thaw by applying additional heat.
4. Do not loosen container lids, caps or covers. Allow syringe packs to equilibrate in tip down orientation.

DIRECTIONS FOR USE

1. This two-part adhesive is designed to cure once the two components come into contact with each other. The material fixtures quickly and cures fully in 24-72 hours.
2. For best performance bond surfaces should be clean and free from grease.
3. Apply Part A to the component.
4. Apply Part B to the heat sink.
5. Apply enough material to each side so that there is enough material to cover at least 80% of the surface between the component and the heat sink and the material leaves a small fillet.
6. Best thermal performance is obtained by using a ratio as close to 50:50 as possible .
7. Place the heat sink on top of the component insuring that the beads of material overlap.
8. Secure the assembly and wait for the adhesive to fixture (approx 5 minutes) before further handling.

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 in original, tightly covered containers in clean, dry areas. Storage information may be indicated on the product container labeling.

Optimal Storage (PART A): -20 °C
Alternative Storage (PART A): 2 to 8 °C
Optimal Storage (PART B): 2 to 8 °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.

Conversions

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

Disclaimer

Note:

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

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