



384™

March 2008

**PRODUCT DESCRIPTION**

384™ provides the following product characteristics:

<b>Technology</b>	Acrylic
<b>Chemical Type</b>	Modified acrylic
<b>Appearance (uncured)</b>	White to off-white paste <sup>LMS</sup>
<b>Components</b>	One component - requires no mixing
<b>Viscosity</b>	High
<b>Cure</b>	Activator
<b>Cure Benefit</b>	Room temperature cure
<b>Application</b>	Bonding
<b>Strength</b>	Medium

384™ is a thermally conductive adhesive system designed for bonding heat generating components to heat sinks. The high thermal conductivity provides excellent heat dissipation for thermally sensitive components, while the controlled strength permits field and service repair. In high pot applications this product should be limited to a maximum of 500 volts. Typical applications include bonding transformers, transistors and other heat generating electronic components to printed circuit board assemblies or heat sinks.

**TYPICAL PROPERTIES OF UNCURED MATERIAL**

Specific Gravity @ 25 °C	1.64
Flash Point - See MSDS	
Viscosity, Brookfield - HBT, 25 °C, mPa·s (cP):	
Spindle TE, speed 2.5 rpm, Helipath	500,000 to 2,250,000 <sup>LMS</sup>
Spindle TE, speed 20 rpm, Helipath	300,000 to 800,000 <sup>LMS</sup>

**TYPICAL PROPERTIES OF CURED MATERIAL****Physical Properties:**

Coefficient of Thermal Expansion, ISO 11359-2, K <sup>-1</sup>	69×10 <sup>-6</sup>
Coefficient of Thermal Conductivity, ISO 8302, W/(m·K)	0.757
Elongation, at break, ISO 527-3, %	0.9
Tensile Strength, at break, ISO 527-3	N/mm <sup>2</sup> 13 (psi) (1,800)
Young's Modulus	N/mm <sup>2</sup> 2,800 (psi) (400,000)

**Electrical Properties:**

Volume Resistivity, IEC 60093, Ω·cm	1.3×10 <sup>12</sup>
Surface Resistivity, IEC 60093, Ω	5.1×10 <sup>13</sup>
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	26.7
Dielectric Constant / Dissipation Factor, IEC 60250:	
100 Hz	6.48 / 0.1
1 kHz	5.86 / 0.04
1 MHz	5.22 / 0.03

**TYPICAL PERFORMANCE OF CURED MATERIAL****Adhesive Properties**

Cured for 24 hours @ 22 °C, Activator 7387™ on 1 side

Lap Shear Strength, ISO 4587:

Steel	N/mm <sup>2</sup> ≥5.2 <sup>LMS</sup> (psi) (≥754)
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**TYPICAL ENVIRONMENTAL RESISTANCE**

Cured for 72 hours @ 22 °C, Activator 7387™ on 1 side

Lap Shear Strength, ISO 4587:

Steel

**Chemical/Solvent Resistance**

Aged under conditions indicated and tested @ 22 °C.

Environment	°C	% of initial strength
		720 h
Air	87	140
Water	87	75
Freon TF	87	85

**Thermal Cycle Resistance**

Bonded aluminum to epoxyglass lapshears cured 72 hours using Activator 7387™ on 1 side were subjected to thermal cycling of 15°C to 100°C with a ramp time of 30 minutes. No loss in strength occurred after 1,000 hours of cycle time.

**GENERAL INFORMATION**

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

**Directions for use**

1. For best performance bond surfaces should be clean and free from grease.
2. Use applicator to apply the activator to the surface to be bonded.
3. After the solvent evaporates, the active ingredients will appear wet, and will remain active for up to 2 hours after application. Contamination of the surface before bonding should be prevented.
4. Apply adhesive to the unactivated surface.
5. Secure the assembly, and wait for the adhesive to fixture (approximately 5 minutes) before any further handling. Full cure occurs in 4 - 24 hours.
6. The amount of adhesive applied to the part or heat sink should be limited to the amount necessary to fill the bond and just enough to give a small fillet.
7. The dispensing or application of the adhesive should be done as to minimize air entrapment within the bondline.

8. The successful application of this product depends on accurate dispensing on the parts to be bonded. Loctite Equipment Engineers are available to assist you in selecting and implementing the appropriate dispensing equipment for your application.

#### Device Removal/Repair

Components or devices bonded with 384™ can be removed while hot using heat from a hot air jet. Bond strength decreases at approximately 65 °C to 93 °C allowing components to be removed with lower shear forces. Method of removal/repair should be specifically determined due to the variety of components or devices bonding behavior.

#### Loctite Material Specification<sup>LMS</sup>

LMS dated October 24, 2003. 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

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$   
 $\text{kV/mm} \times 25.4 = \text{V/mil}$   
 $\text{mm} / 25.4 = \text{inches}$   
 $\mu\text{m} / 25.4 = \text{mil}$   
 $\text{N} \times 0.225 = \text{lb}$   
 $\text{N/mm} \times 5.71 = \text{lb/in}$   
 $\text{N/mm}^2 \times 145 = \text{psi}$   
 $\text{MPa} \times 145 = \text{psi}$   
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$   
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$   
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$   
 $\text{mPa}\cdot\text{s} = \text{cP}$

#### Note

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Reference 1.2