

LOCTITE 384

August 2014

PRODUCT DESCRIPTION

LOCTITE 384 provides the following product characteristics:

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

LOCTITE 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 SDS	
Viscosity, Brookfield - HBT, 25 °C, mPa·s (cP):	
Spindle TE, speed 2.5 rpm, Helipath	500,000 to 2,250,000 ^{LMS}
Spindle TE, speed 20 rpm, Helipath	300,000 to 800,000 ^{LMS}

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties

Coefficient of Thermal Expansion, ISO 11359-2, K ⁻¹	69×10 ⁻⁶
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 ² 13 (psi) (1,800)
Young's Modulus	N/mm ² 2,800 (psi) (400,000)

Electrical Properties

Volume Resistivity, IEC 60093, Ω·cm	1.3×10 ¹²
Surface Resistivity, IEC 60093, Ω	5.1×10 ¹³
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 ² ≥5.2 (psi) (≥754)

TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 72 hours @ 22 °C, Activator 7387™ on 1 side	
Shear Strength	
Lap Shear Strength, ISO 4587:	
Steel	N/mm ² ≥5.2 (psi) (≥754)

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 Safety Data Sheet (SDS).

Directions for use:

- For best performance bond surfaces should be clean and free from grease.
- Use applicator to apply the activator to the surface to be bonded.
- 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.
- Apply adhesive to the unactivated surface.
- Secure the assembly, and wait for the adhesive to fixture (approximately 5 minutes) before any further handling. Full cure occurs in 4 - 24 hours.
- 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.
- 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 LOCTITE 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^{LMS}

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:

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.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA please additionally note the following:

In case Henkel would be nevertheless held liable, on whatever legal ground, Henkel's liability will in no event exceed the amount of the concerned delivery.

In case products are delivered by Henkel Colombiana, S.A.S. the following disclaimer is applicable:

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. 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.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Corporation, Resin Technology Group, Inc., or Henkel Canada Corporation, the following disclaimer is applicable:

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

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 1.3