



315™

April 2008

PRODUCT DESCRIPTION

315™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Modified acrylic
Appearance (uncured)	Blue paste ^{LMS}
Components	One component - requires no mixing
Viscosity	High
Cure	Activator
Application	Bonding

315™ is a self-shimming thermally conductive, one part adhesive for bonding electrical components to heat sinks with an insulating gap. The high thermal conductivity provides excellent heat dissipation for thermally sensitive components, while the controlled strength permits field and service repair. The self-shimming property produces a consistent 5-6 mil gap between the component and the heat sink. This gap results in electrical insulation while maintaining thermal conductivity. Typical applications include bonding transformers, transistors and other heat generating electronic components to printed circuit board assemblies or heat sinks. In high pot applications this product should be limited to a maximum of 500 volts. Activator 7387™ is required for proper curing of Loctite® Output™ adhesives.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.66
Flash Point - See MSDS	
Viscosity, Brookfield - HBT, 25 °C, mPa·s (cP):	
Spindle TF, speed 20 rpm, Helipath	360,000 to 850,000 ^{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)	0.808
Elongation, at break, ISO 527-3, %	1
Tensile Strength, at break, ISO 527-3	N/mm ² 15.0 (psi) (2,180)
Young's Modulus	N/mm ² 2,690 (psi) (390,000)

Electrical Properties:

Volume Resistivity, IEC 60093, Ω·cm	1.3×10 ¹²
Surface Resistivity, IEC 60093, Ω	1.2×10 ¹³
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	26.7
Dielectric Constant / Dissipation Factor, IEC 60250:	
100 Hz	6.17 / 0.09
1 kHz	5.62 / 0.04
1 MHz	4.99 / 0.03

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

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

Lap Shear Strength, ISO 4587, N/mm ² :	
Steel	N/mm ² ≥3.4 ^{LMS} (psi) (≥493)

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

Lap Shear Strength, ISO 4587, N/mm ² :	
Steel	N/mm ² ≥5.5 ^{LMS} (psi) (≥797)

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

Lap Shear Strength, ISO 4587:	
Steel	N/mm ² 6.9 (psi) (1,000)
Aluminum	N/mm ² 5.5 (psi) (800)
Aluminum to Epoxyglass	N/mm ² 4.1 (psi) (600)

Impact Strength, ISO 9653:

Steel	N·m 6.8 (lb·ft) (5)
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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 @ 22 °C 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 1000 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.

Loctite Material Specification^{LMS}

LMS dated December 10, 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: 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 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

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Reference 1.1



LOCTITE[®] 7386

July 2004

PRODUCT DESCRIPTION

LOCTITE[®] 7386 provides the following product characteristics:

Technology	Activator for Loctite toughened acrylic adhesives
Chemical Type	Substituted dihydropyridine
Solvent	n-Heptane and Isopropanol
Appearance	Transparent yellow to light amber liquid ^{LMS}
Viscosity	Very low
Cure	Not applicable
Application	Cure promotion of toughened acrylic adhesives

LOCTITE[®] 7386 is designed to initiate the cure of Loctite toughened acrylic adhesives.

TYPICAL PROPERTIES

Specific Gravity @ 25 °C	0.80
Viscosity @ 25°C, mPa·s (cP)	1 to 2
Flash Point - See MSDS	

TYPICAL PERFORMANCE

Fixture time and cure speed achieved as a result of using LOCTITE[®] 7386 depend on the adhesive used, the substrate bonded, surface cleanliness and whether one or two surface activation is used.

Fixture Time, ISO 4587, minutes:

Steel (degreased) and Loctite [®] Adhesive 330, single side activation	≤4 ^{LMS}
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(Fixture time is defined as the time to develop a shear strength of 0.1 N/mm²)

HANDLING PRECAUTIONS

Activator must be handled in a manner applicable to highly flammable materials and in compliance with relevant local regulations.

The solvent can affect certain plastics or coatings. It is recommended to check all surfaces for compatibility before use.

GENERAL INFORMATION

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected with a sealant for chlorine or other strong oxidizing materials.

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

Under no circumstances should activator and adhesive be mixed directly as liquids. Use only in a well ventilated area.

Where aqueous washing systems are used to clean the surfaces before bonding, it is important to check for compatibility of the washing solution with the adhesive. In some cases these aqueous washes can affect the cure and performance of the adhesive.

Directions for use

1. Most surfaces may be bonded "as received" but contamination such as loose oxide layers or excessive oil may affect cure speed and bond strength. Cleaning is recommended if maximum strength is required.
2. Brush on the activator to one of the mating surfaces to be bonded. Apply adhesive to other surface.
3. For large gaps (>0.40 mm) or where maximum cure speed is required then treatment of both surfaces is recommended.
4. The activator will not dry and will remain active for up to 6 hours. Bond assembly should be completed within this time.
5. Where adhesive is applied onto an activated surface, assembly should be completed as quickly as possible (within 15 seconds).
6. Secure the assembly and await fixturing before any further handling.

Loctite Material Specification^{LMS}

LMS dated July 08, 2004. 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 Loctite Quality.

Storage

This activator is classified as **HIGHLY FLAMMABLE** and must be stored in an appropriate manner in compliance with relevant regulations. Do not store near oxidising agents or combustible materials. The product is light sensitive and accordingly, translucent containers should be kept in a dark place when not in use. Store product in the unopened container in a dry location. Storage information may also be indicated on the product container labelling.

Optimal Storage: 8 °C to 21 °C. Storage below 8 °C or greater than 28 °C can adversely affect product properties.

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel 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
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N/mm x 5.71 = lb/in
N/mm ² x 145 = psi
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mPa·s = cP

Note

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Trademark usage

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Reference 1