

LOCTITE 3873

August 2014

PRODUCT DESCRIPTION

LOCTITE 3873 provides the following product characteristics:

Technology	Acrylic
Chemical Type	Acrylic ester
Appearance (uncured)	Light grey opaque thixotropic fluid with no visible bubbles ^{LMS}
Components	One component - requires no mixing
Viscosity	High
Cure	Activator
Application	Bonding

LOCTITE 3873 is a self-shimming, thermally conductive adhesive. When used with Activator 7387™, it cures rapidly to form a high strength, high modulus, thermoset acrylic polymer. A uniform bondline thickness of 0.127mm results from the incorporation of solid glass spheres. Recommended applications include the bonding of various heat generating devices (power devices) to thermal spreaders.

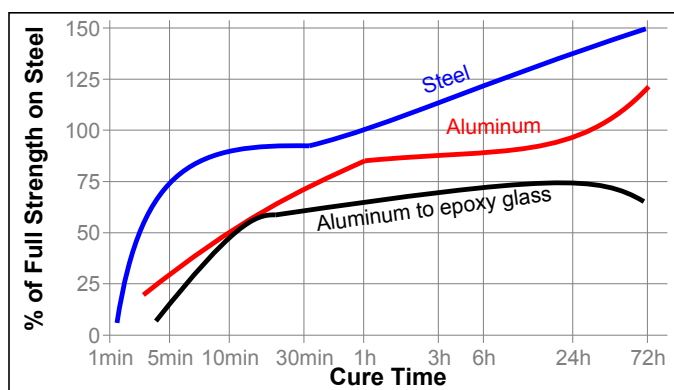
TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	2.08
Viscosity, Brookfield - HBT, 25 °C, mPa·s (cP):	
Spindle TB, speed 0.5 rpm,	750,000 to 2,000,000 ^{LMS}
Spindle TB, speed 5.0 rpm	200,000 to 600,000 ^{LMS}
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE

Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the shear strength developed with time on grit blasted steel lap shears compared to different materials and tested according to ISO 4587. (Activator 7387™ applied to one surface)



TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 24 hours @ 70 °C, followed by 2 days @ RT

Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K ⁻¹	76×10 ⁻⁶
Glass Transition Temperature, °C	49

Cured for 24 hours @ 70 °C, followed by 7 days @ RT

Physical Properties:

Coefficient of Thermal Conductivity, ISO 8302, W/(m·K)	1.25
Shore Hardness, ISO 868, Durometer D	72
Elongation, at break, ISO 527-3, %	3.2
Tensile Strength, at break, ISO 527-3	N/mm ² 9.7 (psi) (1,400)
Young's Modulus	N/mm ² 850 (psi) (123,250)

Cured @ RT

Electrical Properties:

Volume Resistivity, IEC 60093, Ω·cm	4.3×10 ¹⁴
Surface Resistivity, IEC 60093, Ω	3.8×10 ¹⁴
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	23.62

After 1 week @ 85 °C / 85% RH

Electrical Properties:

Volume Resistivity, IEC 60093, Ω·cm	1.5×10 ¹⁴
Surface Resistivity, IEC 60093, Ω	2.6×10 ¹³
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	3.54

TYPICAL PERFORMANCE OF CURED MATERIAL

After 7 days @ 22 °C, Activator 7387™ on 2 sides

Lap Shear Strength, ISO 4587:

Steel	N/mm ² 14.7 (psi) (2,130)
Aluminum	N/mm ² 9.5 (psi) (1,380)

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

Lap Shear Strength, ISO 4587:

Steel	N/mm ² ≥11.7 ^{LMS} (psi) (≥1,696)
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TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 1 week @ 22 °C, Activator 7387™ on 2 sides

Hot Strength

Tested at temperature

Shear Strength

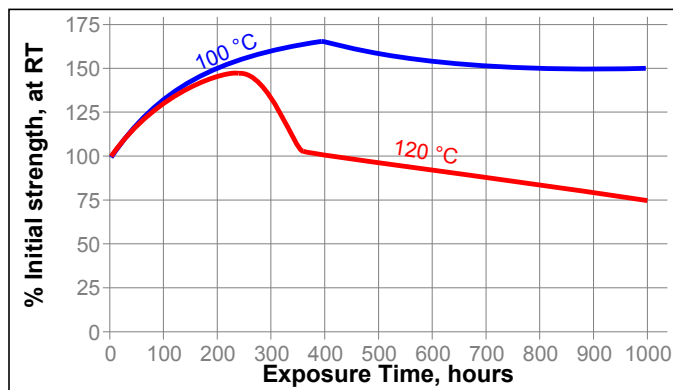
Lap Shear Strength, ISO 4587:

Steel:	
@ 50 °C	N/mm ² 14.7 (psi) (2,130)

@ 100 °C	N/mm ² 8 (psi) (1,160)
@ 125 °C	N/mm ² 5.6 (psi) (815)
Aluminum:	
@ 50 °C	N/mm ² 11.8 (psi) (1,720)
@ 100 °C	N/mm ² 6.5 (psi) (940)
@ 125 °C	N/mm ² 4.2 (psi) (610)
Aluminum to G-10 Epoxyglass:	
@ 50 °C	N/mm ² 8 (psi) (1,160)
@ 100 °C	N/mm ² 6.2 (psi) (900)
@ 125 °C	N/mm ² 2.6 (psi) (380)

Heat Aging

Aged at temperature indicated and tested @ 22 °C



GENERAL INFORMATION

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

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.

This product is not normally recommended for use on plastics (particularly thermoplastic materials where stress cracking of the plastic could result). Users are recommended to confirm compatibility of the product with such substrates.

Directions for use:

1. For best performance bond surfaces should be clean and free from grease.
2. To ensure a fast and reliable cure, Activator 7387™ should be applied to one of the bond surfaces and the adhesive to the other surface. Parts should be assembled within 15 minutes.
3. The recommended bondline gap is 0.1 mm. Where bond gaps are large (up to a maximum of 0.5 mm), or faster cure speed is required, Activator 7387™ should be applied to both surfaces. Parts should be assembled immediately (within 1 minute).
4. Excess adhesive can be wiped away with organic solvent.
5. Bond should be held clamped until adhesive has fixtured.
6. Product should be allowed to develop full strength before subjecting to any service loads (typically 24 to 72 hours after assembly, depending on bond gap, materials and ambient conditions).

Loctite Material Specification^{LMS}

LMS dated May 22, 1998. 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.

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Reference 0.4