



Product 349

March 2003

PRODUCT DESCRIPTION

LOCTITE® 349 UV Adhesive provides the following product characteristics:

Technology	Acrylic
Chemical Type	Modified Methacrylate Ester
Appearance (uncured)	Transparent colorless to pale yellow liquid ^{LMS}
Components	One component - requires no mixing
Viscosity	Medium
Cure	Ultraviolet (UV) Light
Cure Benefit	Production - high speed curing
Application	Bonding
Key Substrates	Glass
Operating Temperature	-54°C to +150°C

Product 349 bonds and seals glass to glass, or glass to metal components such as precision optical instruments, furniture and industrial devices. The electrical properties of this product also make it suitable for potting and tacking applications.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25°C	1.02
Flash Point (TCC), °C	>93
Viscosity @ 25°C, mPa·s:	
Brookfield RVT:	
Spindle 5 @ 20 rpm	6,000 to 13,500 ^{LMS}

TYPICAL CURING PERFORMANCE

This product is cured when exposed to UV radiation of 365nm. To obtain a full cure on surfaces exposed to air radiation at 250nm is also required. The speed of cure will depend on the UV intensity as measured at the product surface. Typical cure condition is 20-30 seconds at 100mW/cm² using a medium pressure, quartz envelope, mercury vapor lamp.

Fixture Time

The fixture time is the light exposure time required for the adhesive to achieve sufficient strength to support a 3 kg weight for 10 seconds in a lap joint assembly. The assembly consists of two 2.54 cm x 10.16 cm strips overlapped to produce a 3.2 cm² bond area. The force is applied in a tensile shear mode.

UV Fixture Time, seconds:

UV Light Sources:

Medium Pressure Hg Arc source, Zeta® 7215:	
10 mW/cm ²	1 to 5
100 mW/cm ²	3 to 8

Surface Cure

Tack Free Time is the time the product must be irradiated with light energy to form a tack free surface.

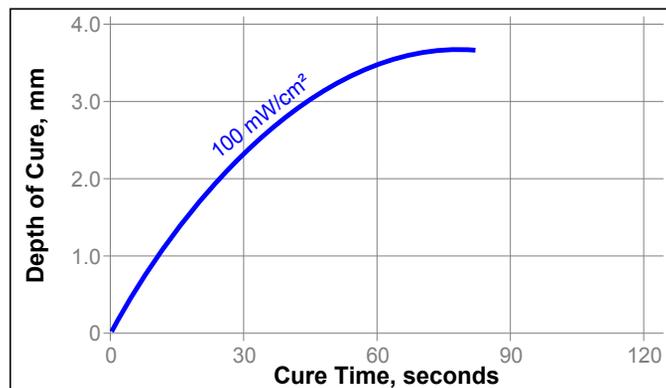
Tack Free Time, ASTM C679, seconds:

UV Light Sources:

Medium Pressure Hg Arc source, Zeta® 7215:	
100 mW/cm ² @ 365 nm	5 to 10

Depth of Cure

The graph below shows the increase in depth of cure with time at 100mW/cm² as measured from the thickness of the cured pellet formed in a 15mm diameter PTFE die.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties

Coefficient of Thermal Expansion, ASTM D 696, /K ⁻¹	80×10 ⁻⁶
Coefficient of Thermal Conductivity, ASTM C177, W·m ⁻¹ K ⁻¹	0.10
Specific Heat, kJ·kg ⁻¹ K ⁻¹	0.30
Hardness, ASTM D 2240, Shore D	70

Electrical Properties

Dielectric Constant / Loss, ASTM D 150: 1kHz	3.55 / 0.025
Volume Resistivity, ASTM D 257, Ω	5×10 ¹⁵
Dielectric Strength, ASTM D 149, kV/mm	90

PERFORMANCE OF CURED MATERIAL

Cured @ 100 mW/cm² @365 nm for 40 seconds.

Adhesive Properties

Tensile Strength, ASTM D 2095, DIN 53282, N/mm ² :	
Grit blasted mild steel to glass	6 to 15
Torsional Shear Strength, N.m:	
Aluminum Hex Button to Glass	≥70 ^{LMS}

TYPICAL ENVIRONMENTAL RESISTANCE

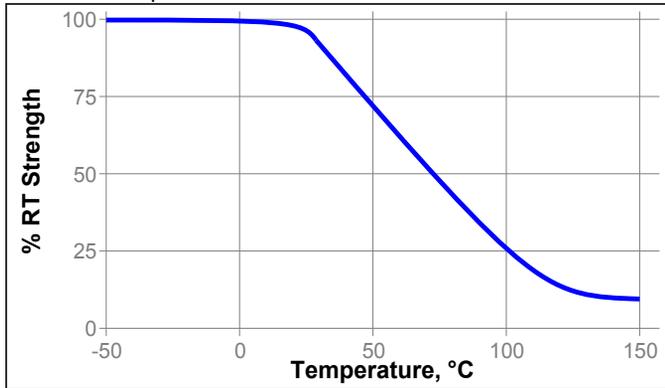
Cured @ 100 mW/cm² @365 nm for 40 seconds and cured 1 week @ 22°C.

Adhesive Properties

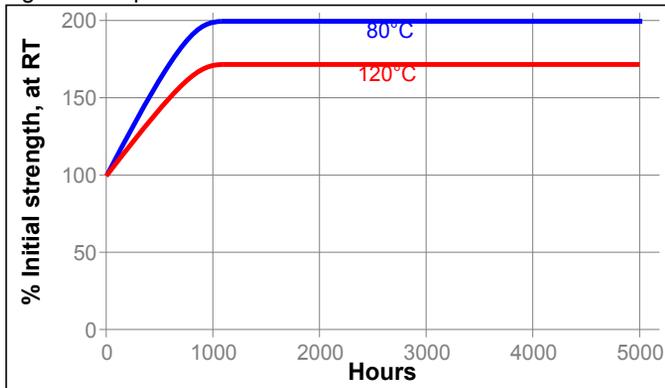
Tensile Strength, DIN 53283, N/mm ² :	
Grit blasted mild steel to glass	

Hot Strength

Tested at temperature

**Heat Aging**

Aged at temperature indicated and tested at 22°C

**Chemical/Solvent Resistance**

Aged under conditions indicated and tested at 22°C.

Environment	°C	% of initial strength		
		100 hr	500 hr	1000 hr
Gasoline	22	100	100	100
Freon TA	22	100	100	100
Industrial Methylated spirit	22	100	100	100
Heat/Humidity 90% RH	40	100	100	70

GENERAL INFORMATION

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

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

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 the 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. This product is light sensitive; exposure to daylight, UV light and artificial lighting should be kept to a minimum during storage and handling.
2. The product should be dispensed from applicators with black feedlines.
3. For best performance bond surfaces should be clean and free from grease.
4. Cure rate is dependent on lamp intensity, distance from light source, depth of cure needed or bondline gap and light transmittance of the substrate through which the radiation must pass.

Loctite Material Specification^{LMS}

LMS dated September 1, 1995. 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

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

Products shall be maintained at temperatures between 8°C to 28°C unless otherwise labeled, or, specified. Storage, at temperatures below 8°C, or, greater than 28°C, is not recommended. Temperatures below 8°C and above 28°C can adversely affect product properties

Material removed from containers may be contaminated during use. Do not return product to the original container. Loctite 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

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 = \text{V/mil}$
 $\text{mm} \times 0.039 = \text{inches}$
 $\text{mPas} = \text{cP}$
 $\text{N/mm}^2 \times 145 = \text{psi}$
 $\text{N} \times 0.225 = \text{lbs}$

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 Loctite 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 Loctite Corporation's products. Henkel Loctite 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 Loctite Corporation patents that may cover such processes or

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Reference 0.0