Technical Data Sheet

LOCTITE® AA 3381™

Known as LOCTITE® 3381™
January 2015

PRODUCT DESCRIPTION

LOCTITE® AA 3381™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Acrylated urethane
Appearance (uncured)	Translucent colorless liquid[LMS]
Components	One component - requires no mixing
Viscosity	Medium
Cure	Ultraviolet (UV) light
Cure Benefit	Production - high speed curing
Application	Bonding
Flexibility	Enhances load bearing & shock absorbing characteristics of the bond area.

LOCTITE® AA 3381™ is designed primarily for potting and sealing glass to metal joints that must withstand thermal cycling and environmental exposure. The product has shown excellent capabilities in bonding dissimilar rigid substrates. Suitable for use in the assembly of **disposable medical devices**.

ISO-10993

An ISO 10993 Test Protocol is an integral part of the Quality Program for LOCTITE® AA 3381™. LOCTITE® AA 3381™ has been qualified to Henkel's ISO 10993 Protocol as a means to assist in the selection of products for use in the medical device industry. Certificates of Compliance are available on Henkel's website or through the Henkel Quality Department.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.08
Flash Point - See SDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 4, speed 20 rpm,	3,600 to 6,600[LMS]

TYPICAL CURING PERFORMANCE

LOCTITE® AA 3381™ can be cured by exposure to UV light at 365 nm. Surface cure is enhanced by exposure to UV light in the 220 to 260 nm range. Cure rate and ultimate depth of cure depend on light intensity, spectral distribution of the light source, exposure time and light transmittance of the substrate through which the light must pass.

Fixture Time

Fixture time is defined as the time to develop a shear strength of 0.1 N/mm² .

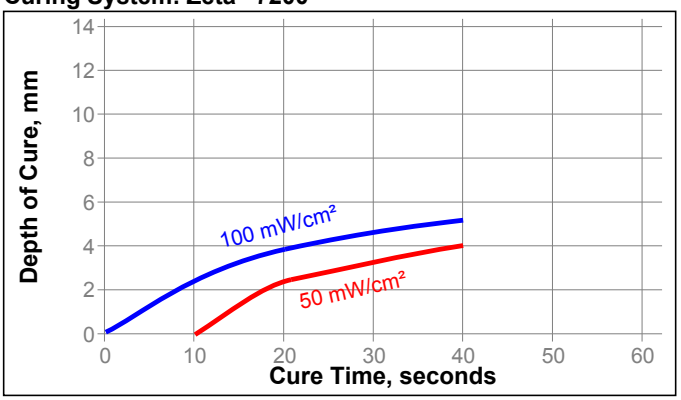
UV Fixture Time, Glass, seconds:

Medium Pressure Hg Arc bulb, Zeta® 7200 light source:	
50 mW/cm² , measured @ 365 nm	≤15[LMS]
Electrodeless, D bulb:	
100 mW/cm² , measured @ 365 nm	7

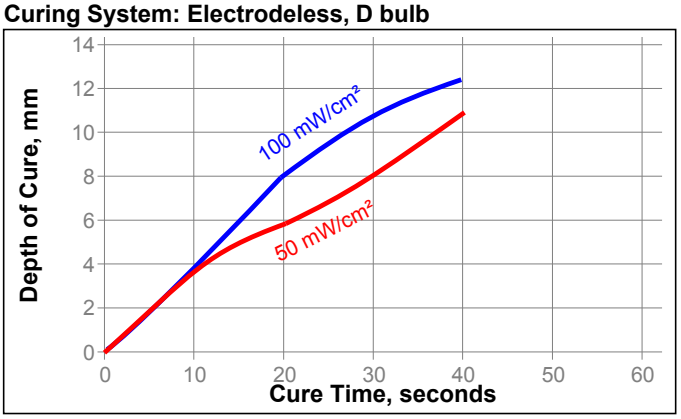
Depth of Cure vs. Irradiance (365 nm)

The graphs below show the increase in depth of cure with time at 50 mW/cm² and 100 mW/cm² as measured from the thickness of the cured test piece.

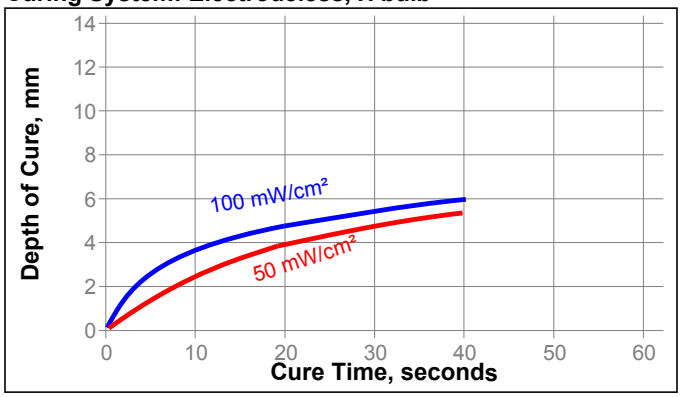
Curing System: Zeta® 7200



Curing System: Electrodeless, D bulb



Curing System: Electrodeless, H bulb



TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 100 mW/cm² , for 30 seconds using an Electrodeless system, D bulb

Physical Properties:

Shore Hardness, ISO 868, Durometer A		≥72[LMS]
Water Absorption, ISO 62, %:		
2 hours in boiling water		4.9
Elongation, at break, ISO 527-3, %		330
Tensile Modulus, ISO 527-3	N/mm²	18.6
	(psi)	(2,670)
Tensile Strength, at break, ISO 527-3	N/mm²	7.91
	(psi)	(1,135)
UV Depth of Cure, mm:		
100 mW/cm² , measured @ 365 nm, for 15 seconds		≥1.6[LMS]

Electrical Properties:

Surface Resistivity, IEC 60093, Ω·cm	7.84×10^{14}
Volume Resistivity, IEC 60093, Ω·cm	1.06×10^{14}
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	37
Dielectric Constant / Dissipation Factor, IEC 60250:	
100 Hz	7.47 / 0.19
1 kHz	6.8 / 0.07
1 MHz	5.59 / 0.05

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured @ 100 mW/cm² , measured @ 365 nm, for 30 seconds using an Electrodeless system, D bulb, (samples with 0.127 mm gap)

Block Shear Strength, ISO 13445:

Glass to Glass	N/mm²	4.2
	(psi)	(610)
Glass to Steel	N/mm²	3.5
	(psi)	(510)
Glass to Aluminum	N/mm²	3.1
	(psi)	(445)

Cured @ 100 mW/cm² , measured @ 365 nm, for 30 secondsusing a medium pressure Hg Arc bulb, Zeta® 7200 light source

Block Shear Strength, ISO 13445:

Polycarbonate to Polycarbonate	N/mm²	≥5.5[LMS]
	(psi)	(≥797)

TYPICAL ENVIRONMENTAL RESISTANCE

Cured @ 100 mW/cm² , measured @ 365 nm, for 30 seconds using an Electrodeless system, D bulb

Block Shear Strength, ISO 13445:

Polycarbonate:

0.127 mm gap

Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

		% of initial strength		
Environment	**°C**	**100 h**	**500 h**	**1000 h**
Water immersion	22	75	40	45
Heat/humidity 95% RH	38	80	100	100
Salt fog	35	65	55	60

Effects of Sterilization

In general, products similiar in composition to LOCTITE® AA 3381™ subjected to standard sterilization methods, such as EtO and Gamma Radiation (25 to 50 kiloGrays cumulative) show excellent bond strength retention. LOCTITE® AA 3381™ maintains bond strength after 1 cycle of steam autoclave. It is recommended that customers test specific parts after subjecting them to the preferred sterilization method. Consult with Loctite® for a product recommendation if your device will see more than 3 sterilization cycles.

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 Safety Data Sheet (SDS).

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.
5. Cooling should be provided for temperature sensitive substrates such as thermoplastics.
6. Plastic grades should be checked for risk of stress cracking when exposed to liquid adhesive.
7. Excess uncured adhesive can be wiped away with organic solvent (e.g. Acetone).
8. Bonds should be allowed to cool before subjecting to any service loads.

Loctite Material Specification[LMS]
LMS dated July 3, 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
(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
µm / 25.4 = mil
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

Reference 1.3