Technical Data Sheet

LOCTITE® AA 3951™

December 2020

PRODUCT DESCRIPTION

LOCTITE® AA 3951™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Acrylated urethane
Appearance (uncured)	Transparent, colorless to straw colored liquid[LMS]
Fluorescence	Positive under UV light[LMS]
Cure	Ultraviolet (UV) / Visible light
Cure Benefit	Production - high speed curing
Application	Flexible
Specific Benefits	• High elongation strength • High adhesion • High humidity resistance • Fast LED Curing

LOCTITE® AA 3951™ is a low viscosity light cure adhesive designed for applications where a fast curing, highly flexible adhesive is required. It is an optimal choice when bonding plasticized PVC, TPEs, and thermoset rubbers. It also maintains high adhesion to rigid substrates such as polycarbonate, ABS, Acrylic, HDPE (when treated), PP (when treated) and more. Suitable for use in the assembly of **disposable medical devices**.

ISO-10993

LOCTITE® AA 3951™ has been tested to Henkel's test protocols based on ISO 10993 biocompatibility standards, as a means to assist in the selection of products for use in the medical device industry.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	~1.05
Viscosity, Cone & Plate, 25 °C, mPa·s (cP): @ 200 s^{-1}	70 to 300[LMS]

Flash Point - See SDS

TYPICAL CURING PERFORMANCE

Stress Cracking

Liquid adhesive is applied to a medical grade polycarbonate bar 2.54 cm by 10.16 mm by 3.175 mm which is then flexed to induce a known stress level. The time until stress cracking is observed.

Stress Cracking, ASTM D 3929, minutes:

6.9 N/mm² stress on bar	<60
13.8 N/mm² stress on bar	≤5
20.7 N/mm² stress on bar	≤1

Fixture Time

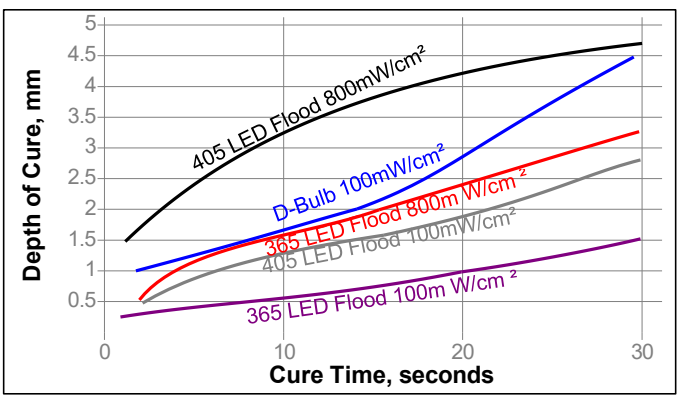
Fixture time is defined as the time to develop a shear strength of 0.1 N/mm² .

UV Fixture Time, Glass microscope slides, seconds:

10 mW/cm² , measured @ 405 nm	≤5[LMS]

Depth of Cure

The graph below shows the increase in depth of cure with time at various light intensities as measured from the thickness of the cured product formed



TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 1 W/cm² , measured @ 405 nm for 10 seconds.

Physical Properties:

Linear Shrinkage, ASTM D 792, %		3.2
Specific Gravity @ 25 °C		~1.15
Shore Hardness, ISO 868, Durometer D		62
Elongation, at break, ISO 527-3, %		251
Tensile Modulus	N/mm²	490
	(psi)	(71,000)
Tensile Strength, ISO 527-3	N/mm²	22.92
	(psi)	(3,324)

Water Absorption, ISO 62, %:	
2 hours in water @ 100 °C	8.5%
Re-Dry Weight, Soluble Matter Lost	2.5%
Glass Transition Temperature , ISO 11359-2, °C	20
Coefficient of Thermal Expansion, ISO 11359-2, K-1:	
Pre Tg	76×10^{-6}
Post Tg	500×10^{-6}
Refractive Index	1.5

Electrical Properties:

Dielectric strength, ASTM D149-97a, kV/mm	~28.5

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured @ 1 W/cm² , measured @ 405 nm for 10 seconds.

Block Shear Strength, ISO 13445:

Acrylic	N/mm²	5.5
	(psi)	(801)
Polycarbonate to PVC	N/mm²	7.7
	(psi)	(1,115)
Polypropylene (plasma treated)	N/mm²	1.1
	(psi)	(160)
LDPE (plasma treated)	N/mm²	3.1
	(psi)	(459)
HDPE (plasma treated)	N/mm²	4.4
	(psi)	(645)
PC (grit blasted) to PC	N/mm²	22.5
	(psi)	(3,268)

Lap Shear Strength, ISO 4587:

PC to Plasticized PVC	N/mm²	2
	(psi)	(292)
PC to Plasticized PVC (Heat Aged 12 days)	N/mm²	1.9
	(psi)	(269)
PC to TPU	* N/mm²	2.9
	* (psi)	(415)
PC to Stainless Steel	N/mm²	3.3
	(psi)	(476)
PC to Steel	N/mm²	4.4
	(psi)	(631)
PC to Aluminum	N/mm²	2.9
	(psi)	(425)
Glass	* N/mm²	4.4
	* (psi)	(631)

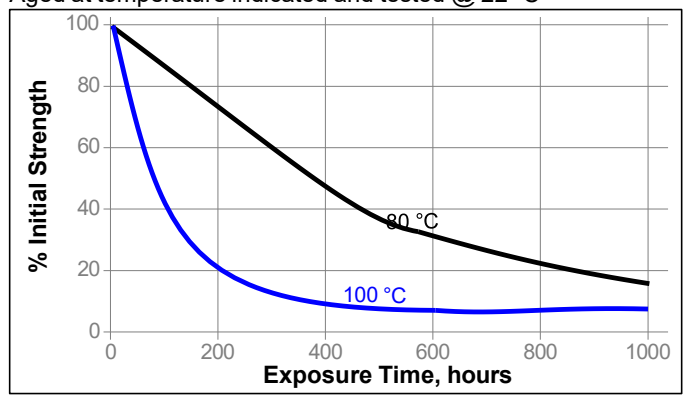
*substrate failure

TYPICAL ENVIRONMENTAL RESISTANCE

Cured @ 1 W/cm² , measured @ 405 nm for 10 seconds PC to PC Block Shear Strength, ISO13445:.

Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Cured @ 1 W/cm² , measured @ 405 nm for 10 seconds PC to PVC Block Shear Strength, ISO13445:

		% of initial strength			
Environment	**°C**	**2 h**	**24 h**	**168 h**	**480 h**
Water	100	173	------	-----	-----
Air	60	-----	------	-----	169
Isopropanol	22	-----	87	-----	-----
Heat/humidity 98% RH	40	-----	-----	75	-----

Sterilization Resistance

Cured @ 1 W/cm² , measured @ 405 nm for 10 seconds PC to PC Block Shear Strength, ISO13445:

Treatment Time	% of Initial Strength
Ethylene Oxide, 1 cycle	88
Ethylene Oxide, 2 cycle	74
GAMMA, >50 Kilo gray	89
Autoclave, 1 cycle	69
Autoclave, 5 cycles	39

:

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 June 5, 2017. 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: 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 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 Henkel 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 0.4