Technical Data Sheet

LOCTITE® AA 3944™

Known as LOCTITE® 3944™
January 2015

PRODUCT DESCRIPTION

LOCTITE® AA 3944™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Acrylated urethane
Appearance (uncured)	Transparent to hazy liquid[LMS]
Fluorescence	Positive under UV light[LMS]
Components	One component - requires no mixing
Viscosity	Medium
Cure	Ultraviolet (UV)/ visible light
Cure Benefit	Production - high speed curing
Application	Bonding

LOCTITE® AA 3944™ is primarily designed for bonding plastic substrates where a flexible, tough bond is required. Its flexibility enhances the load bearing and shock absorbing characteristics of the bond area. It has also shown excellent adhesion to a wide variety of substrates including glass and most metals. 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 3944™. LOCTITE® AA 3944™ 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	1.1
Refractive Index	1.48
Flash Point - See SDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 4, speed 20 rpm,	3,000 to 7,000[LMS]

TYPICAL CURING PERFORMANCE

LOCTITE® AA 3944™ can be cured by exposure to UV and/or visible light of sufficient intensity. To obtain full cure on surfaces exposed to air, radiation at 250 nm is also required. 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 microscope slides, seconds:

Black light, Zeta® 7500 light source:

6 mW/cm² , measured @ 365 nm	≤7[LMS]

Tack Free Time

Tack Free Time is the time required to achieve a tack free surface

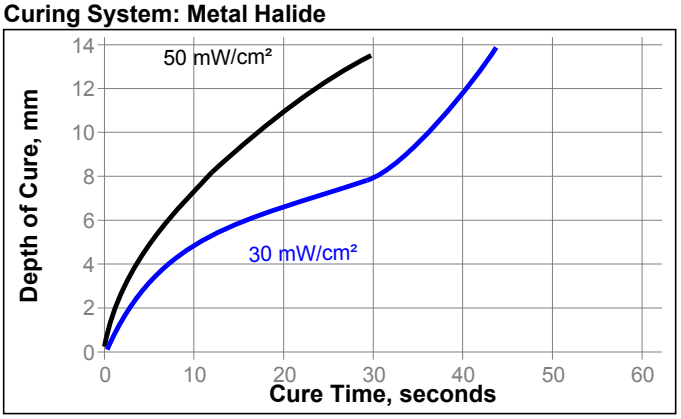
Tack Free Time, seconds:

Metal halide bulb:	
30 mW/cm² , measured @ 365 nm	<5
50 mW/cm² , measured @ 365 nm	<5
50 mW/cm² , measured @ 400 nm	20 to 30
Electrodeless, H bulb:	
100 mW/cm² , measured @ 365 nm	<5
Electrodeless, D bulb:	
100 mW/cm² , measured @ 365 nm	<5
Electrodeless, V bulb:	
250 mW/cm² , measured @ 400 nm	<5
Medium pressure mercury arc:	
100 mW/cm² , measured @ 365 nm	<5

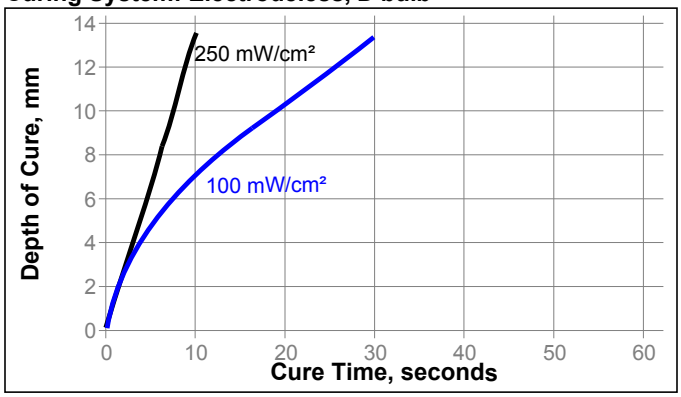
Depth of Cure vs. Irradiance (365 nm)

The graphs below show the increase in depth of cure with time as measured from the thickness of the cured product formed in a 15mm diameter PTFE die. When exposed to a V Bulb at irradiances of 250 and 500 mW/cm² for 10 seconds, a depth of cure greater than 13 mm was achieved. The performance for medium pressure Hg will be similar to Electrodeless system, H bulb.

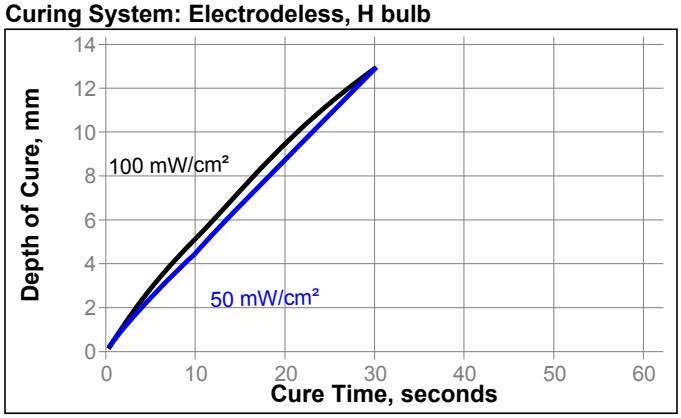
Curing System: Metal Halide



Curing System: Electrodeless, D bulb



Curing System: Electrodeless, H bulb



TYPICAL PROPERTIES OF CURED MATERIAL

25 mW/cm² , measured @ 365 nm, for 15 seconds per side, using a metal halide light source

Physical Properties:

Coefficient of Thermal Expansion, , K^{-1}:		
Pre Tg		125×10^{-6}
Post Tg		190×10^{-6}
Water Absorption, ISO 62, %:		
2 hours in boiling water		8.17
Refractive Index		1.5
Elongation, at break, ISO 527-3, %		86
Tensile Strength, at break, ISO 527-3	N/mm²	20.7
	(psi)	(3,000)
Tensile Modulus, ISO 527-3	N/mm²	393
	(psi)	(57,000)

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured @ 50 mW/cm² , measured @ 365 nm, for 10 secondsusing a Zeta® 7200 light source

Block Shear Strength, ISO 13445:

Polycarbonate to Polycarbonate	N/mm²	≥10.3[LMS]
	(psi)	(≥1,493)

Cured @ 50 mW/cm² , measured @ 365 nm, for 30 seconds using a metal halide light source

Block Shear Strength, ISO 13445:

Polycarbonate to Polycarbonate	N/mm²	18.0
	(psi)	(2,610)
Polycarbonate to PVC	N/mm²	11.8
	(psi)	(1,710)
Polycarbonate to ABS	N/mm²	6.1
	(psi)	(880)
Polycarbonate to Steel	N/mm²	4.8
	(psi)	(700)
Polycarbonate to Aluminum	N/mm²	1.6
	(psi)	(230)
Polycarbonate to Nylon	N/mm²	2.0
	(psi)	(290)
Polycarbonate to Glass	N/mm²	3.6
	(psi)	(520)
Polycarbonate to Polycarbonate:		
Aged @ 49 °C / 100% RH for 4 weeks	N/mm²	6.7
	(psi)	(970)
Polycarbonate to PVC:		
Aged @ 49 °C / 100% RH for 4 weeks	N/mm²	9.7
	(psi)	(1,410)
Polycarbonate to ABS:		
Aged @ 49 °C / 100% RH for 4 weeks	N/mm²	3.0
	(psi)	(435)
Polycarbonate to Steel:		
Aged @ 49 °C / 100% RH for 4 weeks	N/mm²	2.5
	(psi)	(360)

TYPICAL ENVIRONMENTAL RESISTANCE

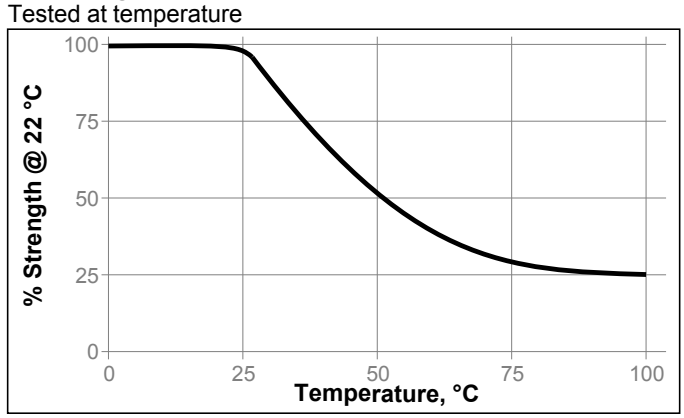
Cured @ 50 mW/cm² , measured @ 365 nm, for 30 seconds using a metal halide light source

Block Shear Strength, ISO 13445:

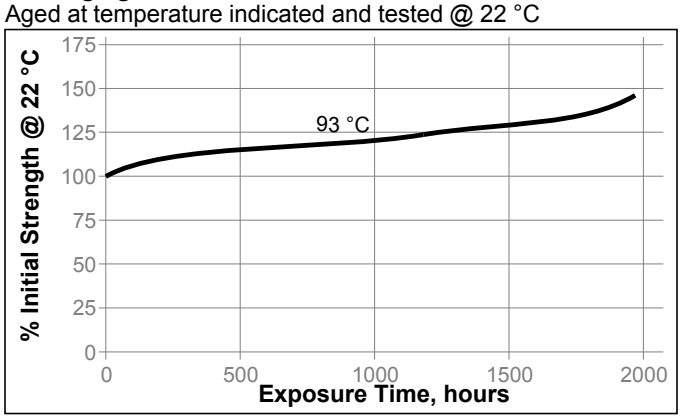
Polycarbonate to Polycarbonate

Hot Strength

Tested at temperature



Heat Aging
Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance
Aged under conditions indicated and tested @ 22 °C

Polycarbonate to Polycarbonate

		% of initial strength	
Environment	**°C**	**500 h**	**1000 h**
Unleaded gasoline	22	75	45
Motor oil (MIL-L-46152)	65	100	75
Salt fog	35	125	70
Isopropanol	22	55	25

Polycarbonate to Steel

		% of initial strength	
Environment	**°C**	**500 h**	**1000 h**
Unleaded gasoline	22	20	25
Motor oil (MIL-L-46152)	65	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 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 April 29, 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: 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 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

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Reference 1.1