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Technical Data Sheet

LOCTITE® AA 3953™

December 2024

PRODUCT DESCRIPTION

LOCTITE® AA 3953™ provides the following product characteristics:

Technology	Acrylic
Chemical type	Acrylated urethane
Appearance (uncured)	Transparent, colorless to straw colored liquid
Fluorescent	Positive under UV light
Cure	Ultraviolet (UV) / Visible light
Cure benefits	Production - high speed curing
Application	Flexible
Specific benefits	• High elongation strength • High adhesion • High humidity resistance • Fast LED curing

LOCTITE® AA 3953™ is a medium 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 3953™ 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	~1.07
Viscosity, Cone & Plate, 25°C, mPa·s (cP): Shear rate 180s^{-1}	300 to 800
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 3.18 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	>3,600
13.8 N/mm² stress on bar	≤5
20.7 N/mm² stress on bar	≤1

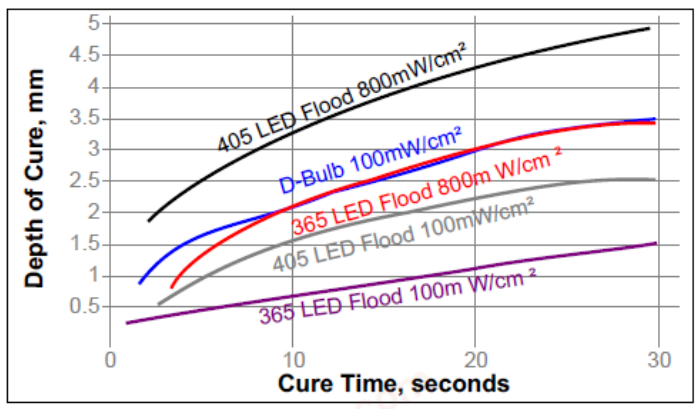
Fixture time

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

UV fixture time, glass slides, seconds:	
10 mW/cm², measured @ 405nm	≤5

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/cm^2, measured @ 405 nm, for 10 seconds.

Physical properties

Linear shrinkage, ASTM D 792, %		2.7
Specific gravity, @ 25°C		~1.15
Shore Hardness, ISO 868, Durometer D		56
Elongation at break, ISO 527-3		233
Tensile modulus,	N/mm² (psi)	193 (28,000)
Tensile strength, ISO 527-3	N/mm² (psi)	22.1 (3,206)
Water absorption, ISO 62, %		
2 hours in water @ 100°C		8.4
Re-dry weight, soluble matter lost		4.6

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Glass transition temperature, ISO 11359-2, °C	13.5
Coefficient of thermal expansion, ISO 11359-2, K^{-1}	
Pre Tg	70 x 10^{-06}
Post Tg	430 x 10^{-06}
Refractive index	1.5

Electrical properties

Dielectric strength, ASTM D149-97a, kV/mm	~28.2

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive properties

Cured @ 1 W/cm^2, measured @ 405 nm, for 10 seconds..

Block shear strength, ISO 13445

Acrylic	N/mm^2 (psi)	4.9 (716)
Polycarbonate to PVC	N/mm^2 (psi)	5.0 (728)
Polypropylene (plasma treated)	N/mm^2 (psi)	1.1 (158)
LDPE (plasma treated)	N/mm^2 (psi)	3.3 (473)
HDPE (plasma treated)	N/mm^2 (psi)	5.7 (832)
PC (grit blasted) to PC	N/mm^2 (psi)	22.5 (3,245)

Lap shear strength, ISO 4587

PC to plasticized PVC	N/mm^2 (psi)	1.6 (236)
PC to plasticized PVC (heat aged 12 days)	N/mm^2 (psi)	1.7 (246)
PC to TPU	N/mm^2 (psi)	2.5 (356)
PC to stainless steel	N/mm^2 (psi)	3 (438)
PC to steel	N/mm^2 (psi)	3.6 (528)
PC to Aluminum	N/mm^2 (psi)	3.4 (494)
Glass	N/mm^2 (psi)	5 (727)

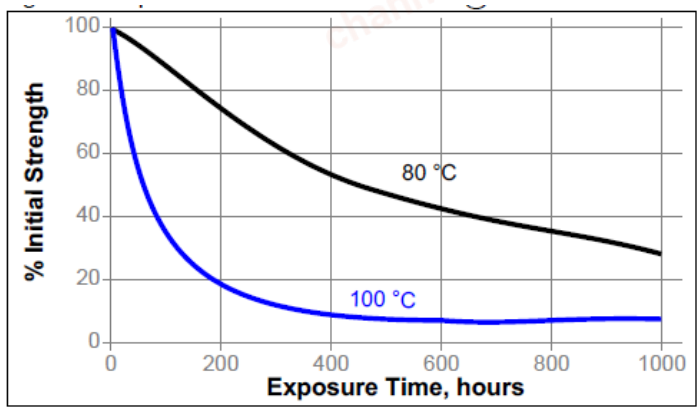
*substrate failure

TYPICAL ENVIRONMENTAL RESISTANCE

Cured @ 1 W/cm^2, measured @ 405 nm, for 10 seconds.
PC to PC Block shear strength, ISO 13445

Heat aging

Aged at temperature indicated and tested @ 22 °C.



Chemical/solvent resistance

Cured @ 1 W/cm^2, measured @ 405 nm, for 10 seconds.
PC to PVC Block shear strength, ISO 13445

		% of initial strength			
Environment	°C	2 h	24 h	168 h	480 h
Water	100	197	-	-	-
Air	60	-	-	-	112
Isopropanol	22	-	86	-	-
Heat/humidity 98% RH	40	-	-	81	-

Sterilization resistance

Cured @ 1 W/cm^2, measured @ 405 nm, for 10 seconds.
PC to PC Block shear strength, ISO 13445

Treatment time:	% of initial strength
Ethylene oxide, 1 cycle	75
Ethylene oxide, 2 cycle	69
GAMMA, >50 Kilo gray	91
Autoclave, 1 cycle	73
Autoclave, 2 cycle	46

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.

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DIRECTIONS FOR USE

1. LOCTITE® AA 3953™ is UV 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 and other contaminants.
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. Crystalline and semi-crystalline thermoplastics should be checked for risk of stress cracking when exposed to liquid adhesive.
7. Excess adhesive can be wiped away with organic solvent.
8. Bonds should be allowed to cool before subjecting to any service loads.

LOCTITE® Material specification LMS

LMS dated April 28, 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.

Product specification

The technical data contained herein are intended as reference only and are not considered specifications for the product. Product specifications are located on the Certificate of Analysis or please contact Henkel representative.

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 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

Disclaimer

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