

## LOCTITE® AA 3971™

Known as known as LOCTITE® 3971  
May 2024

### PRODUCT DESCRIPTION

LOCTITE® AA 3971™ provides the following product characteristics:

<b>Technology</b>	Acrylic
<b>Chemical Type</b>	UV acrylic
<b>Appearance (uncured)</b>	Transparent liquid
<b>Fluorescence</b>	Positive under UV light
<b>Components</b>	One component – requires no mixing
<b>Viscosity</b>	Low
<b>Cure</b>	Ultraviolet (UV)/ visible light
<b>Application</b>	Bonding
<b>Specific Benefits</b>	Production - high speed curing

LOCTITE® AA 3971™ is suitable for a wide variety of applications that require fast cure and high adhesion to plasticized materials. LOCTITE® AA 3971™ cures in seconds when exposed to light of the proper wavelength and intensity. The ability of this product to fluoresce under black light facilitates inspection of bonded assemblies for adhesive presence. LOCTITE® AA 3971™ was specifically designed for bonding stainless steel cannulae into hubs, syringes and lancets for needle assemblies. Suitable for use in the assembly of **disposable medical devices**. The viscosity of this product makes the adhesive well suited for applications where the adhesive will be dispensed in the well after the cannulae and the hub have been assembled.

### ISO-10993

LOCTITE® AA 3971™ 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, Brookfield	
RVT, @25°C, mPa·s (cP)	315
Spindle 2, Speed 20 rpm	

### TYPICAL CURING PERFORMANCE

#### Fixture Time

UV fixture time is defined as the light exposure time required to develop a shear strength of 0.1 N/mm<sup>2</sup>.

UV Fixture Time, Glass microscope slides, seconds:

LED flood light, CL42:	
100 mW/cm <sup>2</sup> , measured @ 405 nm,	5
100 mW/cm <sup>2</sup> , measured @ 365 nm,	5

UV Fixture Time, Glass microscope slides, seconds:

Black light:	
6 mW/cm <sup>2</sup> , measured @ 365 nm,	7
Zeta® 7410 light source:	
30 mW/cm <sup>2</sup> , measured @ 365 nm,	5
Electrodeless, D bulb:	
100 mW/cm <sup>2</sup> , measured @ 365 nm,	5

### Tack Free Time

Tack free time is the time required to achieve a tack free surface.

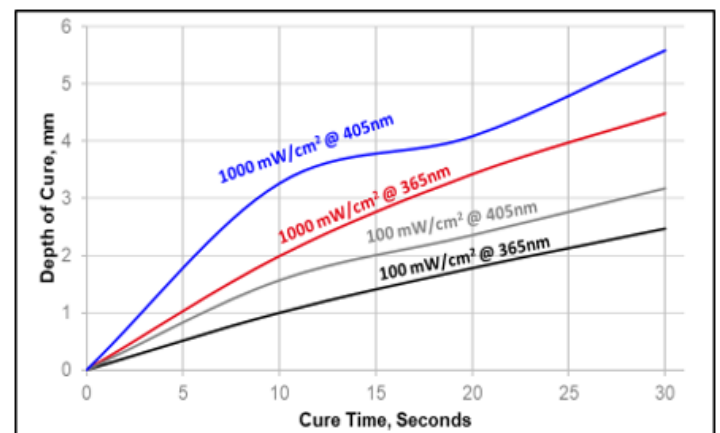
Tack Free Time, seconds:

LED flood light, CL42:	
100 mW/cm <sup>2</sup> , measured @ 405 nm,	40
1000 mW/cm <sup>2</sup> , measured @ 405 nm,	5
100 mW/cm <sup>2</sup> , measured @ 365 nm,	5
1000 mW/cm <sup>2</sup> , measured @ 365 nm,	5
Zeta® 7410 light source:	
30 mW/cm <sup>2</sup> , measured @ 365 nm,	8
Electrodeless system, D bulb:	
100 mW/cm <sup>2</sup> , measured @ 365 nm,	5

### Depth of Cure vs. Irradiance (LED)

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.

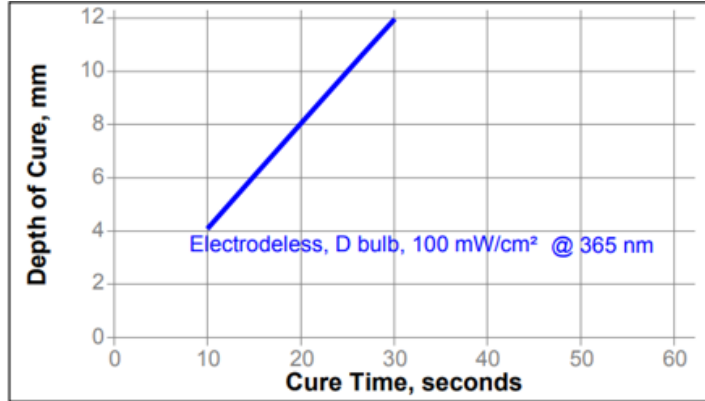
### Curing System: LED flood light, CL42



**Depth of Cure vs. Irradiance (365 nm)**

The graph below shows the increase in depth of cure with time at 100 mW/cm<sup>2</sup> as measured from the thickness of the cured product formed in an aluminum weighing dish.

**Curing System: Metal Halide (Iron)**



**TYPICAL PERFORMANCE OF CURED MATERIAL**

Cured @ 1,000 mW/cm<sup>2</sup>, measured @ 365 nm, for 10 seconds using an Electrodeless system, D bulb

Needle Pullout Strength:

Material	22 Gauge Cannula	27 Gauge Cannula
ABS	N (lb) 182 (41)	N (lb) 93 (21)
Acrylic	N (lb) 192 (43)	N (lb) 102 (23)
Polycarbonate	N (lb) 178 (40)	N (lb) 80 (18)
Polyethylene	N (lb) 13 (3)	N (lb) 13 (3)
Polyethylene (plasma treated)	N (lb) 125 (28)	N (lb) 111 (25)
Polypropylene	N (lb) 22 (5)	N (lb) 9 (2)
Polypropylene (plasma treated)	N (lb) 31 (7)	N (lb) 22 (5)
Polystyrene	N (lb) 205 (46)	N (lb) 120 (27)
Polyurethane	N (lb) 182 (41)	N (lb) 111 (25)

Cured @ 100 mW/cm<sup>2</sup>, measured @ 365 nm, for 30 seconds.  
Block Shear Strength, ISO 13445:

Acrylic to Glass	N/mm <sup>2</sup> 3.0 (psi) (440)
Acrylic to Acrylic	N/mm <sup>2</sup> 12 (psi) (1,740)
G-10 Epoxyglass to Glass	N/mm <sup>2</sup> 7.0 (psi) (1,020)
Nylon to Glass	N/mm <sup>2</sup> 2.5 (psi) (360)
Polybutylene Terephthalate to Glass	N/mm <sup>2</sup> 4.4 (psi) (640)
Polycarbonate to Polycarbonate	N/mm <sup>2</sup> 22 (psi) (3,200)

Polyvinylchloride to Glass	N/mm <sup>2</sup> 5.5 (psi) (800)
Aluminum (grit blasted) to Glass	N/mm <sup>2</sup> 17 (psi) (2,500)
Steel (grit blasted) to Glass	N/mm <sup>2</sup> 13 (psi) (1,900)

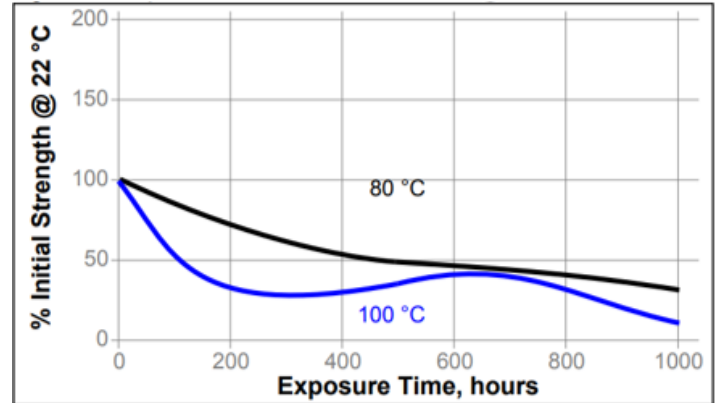
**TYPICAL ENVIRONMENTAL RESISTANCE**

Cured @ 30 mW/cm<sup>2</sup>, measured @ 365 nm, for 30 seconds.

Block Shear Strength, ISO 13445:  
Polycarbonate to polycarbonate

**Heat Aging**

Aged at temperature indicated and tested @ 22 °C.



**Chemical/Solvent Resistance**

Aged under conditions indicated and tested @ 23 °C.

Environment	°C	% of initial strength			
		24 h	100 h	500 h	1000 h
95% RH	40	--	95	45	55
Water Immersion	22	--	100	65	85
Isopropanol	22	75	--	--	--
Heptane	22	85	--	--	--

**Thermal Stability of Needle Assemblies**

Aged @ 60°C and tested @ 22 °C

Needle Pullout Strength, % of initial strength:	4 weeks	8 weeks
Polycarbonate:		
22 Gauge Cannula	50	40
27 Gauge Cannula	65	45
Polypropylene (plasma treated):		
22 Gauge Cannula	85	40
27 Gauge Cannula	60	60
Polystyrene:		
22 Gauge Cannula	60	45
27 Gauge Cannula	55	45



**Sterilization Resistance of Needle Assemblies**

Sterilized as indicated and tested @ 22 °C

Needle Pullout Strength, % of initial strength:

	<b>Gamma</b>	<b>ETO</b>	<b>Autoclave</b>	
	30 kGy	1 Cycle	1 Cycle	5 Cycles
Polycarbonate				
22 Gauge Cannula	95	45	30	5
27 Gauge Cannula	90	55	55	5
Polypropylene (plasma treated)				
22 Gauge Cannula	90	70	70	60
27 Gauge Cannula	100	80	120	80
Polystyrene				
22 Gauge Cannula	100	55	---	---
27 Gauge Cannula	110	65	---	---

**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 application 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 transmission 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.

**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.

**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.

**Approval and certificate**

Please contact Henkel representative for related approval or certificate of this product.

**Data ranges**

The data contained herein may be reported as a typical value. Values are based on actual test data and are verified on a periodic basis.

Temperature/Humidity Ranges: 23°C / 50% RH = 23±2°C / 50±5% RH

**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/mm<sup>2</sup> 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**

The information provided in this Technical data sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product. Any liability in respect of the information in the Technical data sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

**In case products are delivered by Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA please additionally note the following:**

In case Henkel would be nevertheless held liable, on whatever legal ground, Henkel's liability will in no event exceed the amount of the concerned delivery.



**In case products are delivered by Henkel Colombiana, S.A.S. the following disclaimer is applicable:**

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product. Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

**In case products are delivered by Henkel Corporation, or Henkel Canada Corporation, the following disclaimer is applicable:**

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 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 Corporation's products. Henkel 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 Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

**Trademark usage**

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 2.6