Technical Data Sheet

LOCTITE® AA 3961™

September 2020

PRODUCT DESCRIPTION

LOCTITE® AA 3961™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Acrylated urethane
Appearance (uncured)	Transparent, colorless to straw[LMS]
Fluorescence	Positive under UV light[LMS]
Cure	Ultraviolet (UV) / Visible light
Cure Benefit	Production - high speed curing
Application	Rigid Bonding
Product Benefits	• Fast & tack free LED curing • High adhesion to metal and plastic • Excellent humidity and accelerated aging resistance • Wicking grade

LOCTITE® AA 3961™ is an ultra low viscosity light cure adhesive designed for applications where a fast curing, rigid adhesive is required. It is an optimal choice when bonding various metals and plastics. It maintains high adhesion to rigid substrates such as stainless steel, polycarbonate, ABS, Acrylic, HDPE (when treated), PP (when treated) and more. LOCTITE® AA 3961™ is suitable for use in the assembly of **disposable medical devices**.

ISO-10993

LOCTITE® AA 3961™ 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 ~1.02

Viscosity @ 25°C, mPa·s (cP):

Physica Cone & Plate:

Cone CP50-1, 100s-1, @ 180 sec 40 to 120[LMS]

Flash Point - See SDS

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.

Stress Cracking, ASTM D 3929, minutes:

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

TYPICAL CURING PERFORMANCE

Fixture Time

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

UV Fixture Time, , seconds:

10 mW/cm² , measured @ 405 nm LED ≤5[LMS]

Tack Free Time

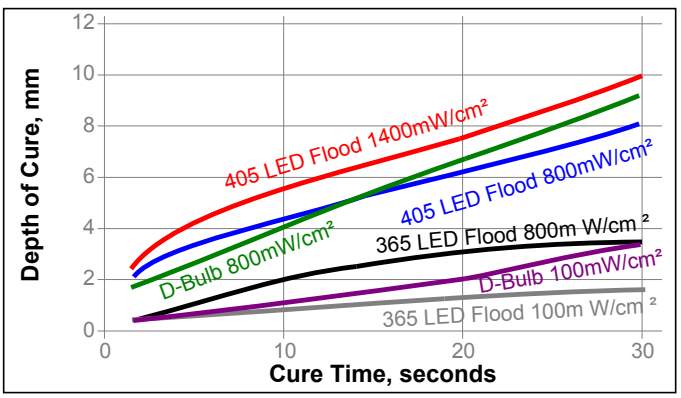
Tack Free Time is the time in seconds required to achieve a tack free surface

Tack Free Time, seconds:

1,400 mW/cm² , measured @ 405 nm LED ≤5

Depth of Cure

The graph below shows the thickness of cured (solidified) polymer with time at various light intensities as measured from the top surface of the adhesive.



TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 1,000 mW/cm² , measured @ 405 nm for 10 seconds.

Physical Properties:

Linear Shrinkage, ASTM D 792,, %		3.1
Specific Gravity @ 25 °C		~1.11
Shore Hardness, ISO 868, Durometer D		75
Elongation, at break, ISO 527-3, %		4.5
Tensile Modulus, ISO 527-3	N/mm²	1,250
	(psi)	(181,000)
Tensile Strength, at break, ISO 527-3	N/mm²	28
	(psi)	(4,050)
Water Absorption, ISO 62, %:		
2 hours in water @ 100 °C		5.9
Re-Dry Weight, Soluble Matter Lost		1.4
Glass Transition TemperatureISO 11359-2, °C		49.5
Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}:		
	Below Tg	96×10^{-6}
	Above Tg	202×10^{-6}
Refractive Index, ASTM D542		1.51

Electrical Properties:

Dielectric strength, ASTM D149-97a, kV/mm	~30.3

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

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

Block Shear Strength, ISO 13445:

Acrylic:		
	N/mm²	4.5
	(psi)	(655)
Polypropylene (plasma treated):		
	N/mm²	1.0
	(psi)	(149)
LDPE (plasma treated):		
	N/mm²	5.9
	(psi)	(849)
HDPE (plasma treated):		
	N/mm²	7.1
	(psi)	(1,040)
Polycarbonate to PVC:		
	N/mm²	22.1
	(psi)	(3,200)
Polycarbonate to Polycarbonate:		
	N/mm²	22.1
	(psi)	(3,200)

Lap Shear Strength, :

Polycarbonate to Plasticized PVC:		
	* N/mm²	1.1
	* (psi)	(154)
Polycarbonate to Plasticized PVC (+12d @65°C)**:		
	* N/mm²	1.9
	* (psi)	(278)
Polycarbonate to TPU:		
	* N/mm²	1.8
	* (psi)	(258)
Polycarbonate to Stainless Steel:		
	* N/mm²	4.9
	* (psi)	(708)
Polycarbonate to Steel:		
	* N/mm²	9.3
	* (psi)	(1,350)
Polycarbonate to Aluminum:		
	* N/mm²	7.3
	* (psi)	(1,065)
Glass:		
	* N/mm²	2.4
	* (psi)	(351)

*All replicates for the substrates exhibited substrate failure

**Stored for 12 days at 65°C to test for plasticizer leaching effects

Cured @ 2 W/cm2 each side (two, diametrically opposed LEDs), measured at 405nm, for 5 seconds

Needle Pullout Strength, N (lb):

Hub Material	22 Gauge Cannula	27 Gauge Cannula
ABS	316 (71)	150 (34)*
Acrylic	319 (72)	154 (35)*
Polycarbonate	310 (70)	151 (34)*
Polyethylene	73 (16)	95 (21)
Polyethylene (plasma treated)	210 (47)	153 (34)*
Polypropylene	60 (13)	31 (7)
Polypropylene (plasma treated)	231 (52)	145 (33)*
Polystyrene	265 (60)	137 (31)
Polyurethane	229 (52)	137 (31)

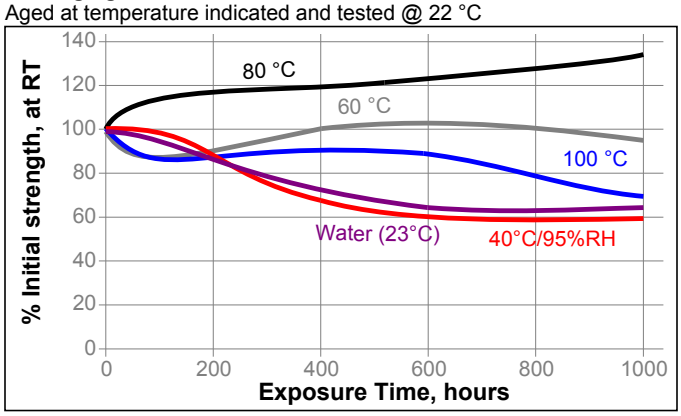
**50% or more of the replicates exhibited substrate failure at the cannula

TYPICAL ENVIRONMENTAL RESISTANCE

Cured @ 1,000 mW/cm² , measured @ 405 nm for 10 seconds.
PC to PVC Block Shear Strength, ISO 13445:

Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 23 °C.

		% of initial strength	
Environment	**°C**	**2 h**	**24 h**
Water	100	78	-
Isopropanol	22	-	90
Bleach (40:1)	22	49	80

Sterilization/Accelerated Aging Resistance

Cured @ 2,000 mW/cm² , measured @ 405 nm for 5 seconds(two, diametrically opposed LEDs).

	Polycarbonate		Polypropylene (Plasma Treated)	
Sterilization	**22G**	**27G**	**22G**	**27G**
EtO, 1 cycle	115	101	102	106
EtO, 2 cycle	113	97	97	104
Gamma, >50 kgray	88	83	100	88
Autoclave, 1 cycle	60	90	71	88
Autoclave, 5 cycles	43	30	52	66
Accelerated aging				
60°C, 4 Weeks	112	98	89	102
60°C, 8 Weeks	107	83	93	96

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 August 5, 2019. 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

Note:

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.

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Reference 0.1