

LOCTITE[®] AA 3974[™]

Known as LOCTITE[®] 3974[™]
November 2014

PRODUCT DESCRIPTION

LOCTITE[®] AA 3974[™] provides the following product characteristics:

Technology	Acrylic
Chemical Type	UV acrylic
Appearance (uncured)	Translucent colorless liquid ^{LMS}
Components	One component - requires no mixing
Viscosity	Medium
Cure	Ultraviolet (UV)/ visible light
Cure Benefit	Production - high speed curing
Application	Bonding

LOCTITE[®] AA 3974[™] is a one component UV/Visible light cure acrylic designed for potting, sealing and bonding thermoplastics, glass and metals that must withstand thermal cycling and environmental exposure. Rapid cure is achieved by exposure to ultraviolet light or visible light of the appropriate wavelength. LOCTITE[®] AA 3974[™] is 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 3974[™]. LOCTITE[®] AA 3974[™] 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 1.09
 Viscosity, Cone & Plate, 25 °C, mPa·s (cP):
 Physica MC101, Cone CP50-1 @ 50 s⁻¹ 1,000 to 3,800^{LMS}
 Flash Point - See SDS

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, Glass microscope slides, seconds:

Medium Pressure Hg Arc bulb, Zeta[®] 7200 light source:
 50 mW/cm², measured @ 365 nm, no gap ≤12^{LMS}

Electrodeless system, V bulb:
 100 mW/cm², measured @ 365 nm ≤5

Cure Jet 405:
 100 mW/cm², measured @ 405 nm ≤5

Electrodeless, D bulb:
 100 mW/cm², measured @ 365 nm ≤5

Zeta[®] 7411:
 100 mW/cm², measured @ 365 nm ≤5

Tack Free Time

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

Tack Free Time, seconds:

Electrodeless system, V bulb:
 100 mW/cm², measured @ 365 nm 105 to 120

Electrodeless system, D bulb:
 100 mW/cm², measured @ 365 nm 30 to 45

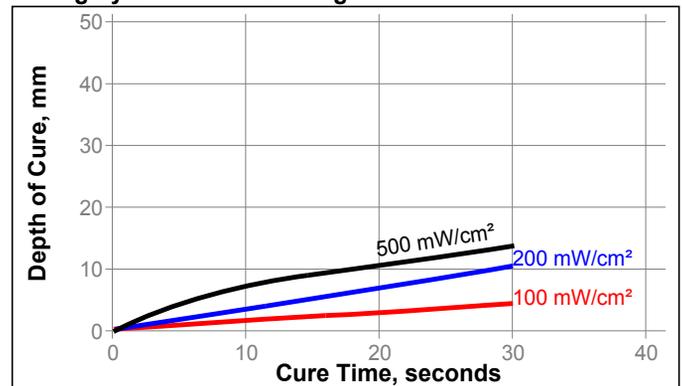
Depth of Cure

Depth of cure (cure time 30 seconds), mm:
 100 mW/cm², measured @ 365 nm, using a Zeta[®] 7200 light source ≥1.6^{LMS}

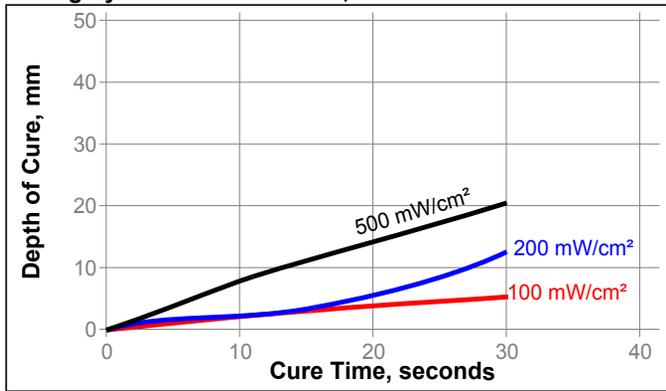
Depth of Cure

The following graphs show the effect of light source, light intensity and exposure time on depth of cure for LOCTITE[®] AA 3974[™]

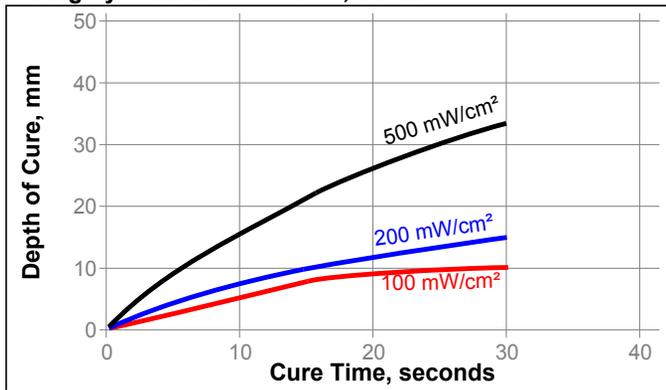
Curing System: Loctite[®] Indigo[™] Cure Jet 405



Curing System: Electrodeless, D bulb



Curing System: Electrodeless, V bulb



TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 100 mW/cm², measured @ 365 nm, for 60 seconds using a Zeta® 7200 light source

Physical Properties:

Shore Hardness, ISO 868, Durometer A ≤90^{LMS}

Cured @ 100 mW/cm², measured @ 365 nm, for 30 seconds using an electrodeless system, V bulb

Physical Properties:

Water Absorption, ISO 62, %:	
2 hours in water @ 100 °C	5.8
Linear Shrinkage, ASTM D 792, %	2.6
Elongation, at break, ISO 527-3, %	100
Shore Hardness, ISO 868, Durometer A	77
Tensile Strength, ISO 527-3	N/mm² 16 (psi) (2,280)
Tensile Modulus, ISO 527-3	N/mm² 33 (psi) (4,880)

Electrical Properties:

Surface Resistivity, IEC 60093, Ω	1.25×10 ¹⁴
Volume Resistivity, IEC 60093, Ω·cm	1.1×10 ¹²
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	17
Dielectric Constant / Dissipation Factor, IEC 60250:	
1 kHz	5.43 / 0.15
1 MHz	4.44 / 0.05

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured @ 100 mW/cm², measured @ 365 nm, for 30 seconds using a Zeta® 7200 light source

Block Shear Strength, ISO 13445:

Polycarbonate (UV Transmitting)	N/mm² ≥6.6 ^{LMS} (psi) (≥960)
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Cured @ 200 mW/cm², measured @ 365 nm, for 30 seconds using an electrodeless system, V bulb, plus 24 hours @ 22 °C

Block Shear Strength, ISO 13445:

Polycarbonate to Polycarbonate	N/mm² 13 (psi) (1,910)
Glass to Glass	N/mm² 1.6 (psi) (240)
Glass to Steel	N/mm² 2 (psi) (310)
Glass to Aluminum	N/mm² 1.6 (psi) (230)
Glass to Stainless steel	N/mm² 0.6 (psi) (85)
Glass to Polycarbonate	N/mm² 2.7 (psi) (400)
Polycarbonate to Aluminum	N/mm² 0.9 (psi) (130)

Cured @ 200 mW/cm², measured @ 365 nm, for 30 seconds using an electrodeless system, V bulb, plus 24 hours @ 22 °C

Miscellaneous

Needle Pullout Strength:

Polycarbonate (22 gauge hubs); to Stainless steel (Cannula)	N 19 (lb) (4.3)
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TYPICAL ENVIRONMENTAL RESISTANCE

Cured @ 200 mW/cm², measured @ 365 nm, for 30 seconds using an Electrodeless system, V bulb

Block Shear Strength, ISO 13445:

Polycarbonate to Polycarbonate

Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22°C, after 24 hours @ 22 °C

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Air	70	50	50	50
Air	95	60	60	60
Water immersion	22	80	50	40
95% RH	38	80	25	10
Salt fog	35	60	35	25

Thermal Stability of Needle Assemblies

Aged for 100 cycles between -40 to 150 °C, 30 minute ramp, 30 minute hold, followed by 24 hours @ 22 °C. Tested @ 22 °C

Needle Pullout Strength, % of initial strength:

Polycarbonate (22 gauge hubs); to Stainless steel (Cannula)	220
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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 November 19, 2008. 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: Storage temperature is dependent upon package size. Consult product label or Henkel Certificate of Analysis for packaged storage conditions. 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

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 = \text{V/mil}$
 $\text{mm} / 25.4 = \text{inches}$
 $\mu\text{m} / 25.4 = \text{mil}$
 $\text{N} \times 0.225 = \text{lb}$
 $\text{N/mm} \times 5.71 = \text{lb/in}$
 $\text{N/mm}^2 \times 145 = \text{psi}$
 $\text{MPa} \times 145 = \text{psi}$
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$
 $\text{mPa}\cdot\text{s} = \text{cP}$

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.

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Reference 0.1