

LOCTITE® AA 3974™

Known as LOCTITE® 3974
April 2024

PRODUCT DESCRIPTION

LOCTITE® AA 3974™ provides the following product characteristics:

| | |
|-----------------------------|------------------------------------|
| Technology | Acrylic |
| Chemical Type | UV acrylic |
| Appearance (uncured) | Translucent colorless liquid |
| Components | One component – requires no mixing |
| Viscosity | Medium |
| Cure | Ultraviolet (UV) / Visible light |
| Application | Bonding |
| Specific Benefits | Production - high speed curing |

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

LOCTITE® AA 3974™ 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 | 1.09 |
| Viscosity, Cone & Plate, 25 °C, mPa·s (cP): | |
| Physica MC101, Cone CP50-1 @ 50 s ⁻¹ | 2,400 |

TYPICAL CURING PERFORMANCE

LOCTITE® AA 3974™ can be cured by exposure to UV and/or visible light of sufficient intensity. To obtain full cure on surfaces exposed to air, radiation @ 220 to 260 nm is also required. The speed and depth of cure will depend upon the UV intensity and spectral distribution of the light source, the exposure time and the light transmittance of the substrates.

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:

| | |
|--|---|
| LED flood light, CL42: | |
| 100 mW/cm ² , measured @ 405 nm | 5 |
| 100 mW/cm ² , measured @ 365 nm | 5 |

Medium Pressure Hg Arc bulb, Zeta® 7200 light source:

| | |
|---|----|
| 50 mW/cm ² , measured @ 365 nm, no gap | 12 |
| Electrodeless system, V bulb: | |
| 100 mW/cm ² , measured @ 365 nm | 5 |
| CureJet 405: | |
| 100 mW/cm ² , measured @ 405 nm | 5 |
| Electrodeless system, D bulb: | |
| 100 mW/cm ² , measured @ 365 nm | 5 |
| Zeta® 7411: | |
| 100 mW/cm ² , measured @ 365 nm | 5 |

Tack Free Time

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

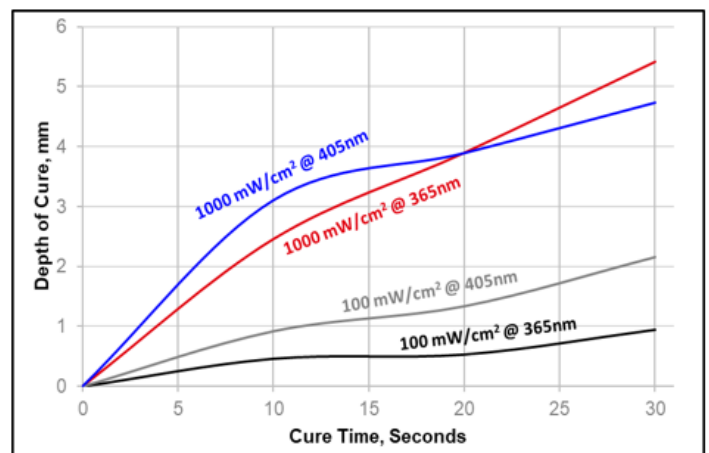
Tack Free Time, seconds:

| | |
|---|-----|
| LED flood light, CL42: | |
| 100 mW/cm ² , measured @ 405 nm | 60 |
| 1000 mW/cm ² , measured @ 405 nm | 60 |
| 100 mW/cm ² , measured @ 365 nm | 60 |
| 1000 mW/cm ² , measured @ 365 nm | 60 |
| Electrodeless system, V bulb: | |
| 100 mW/cm ² , measured @ 365 nm | 112 |
| Electrodeless system, D bulb: | |
| 100 mW/cm ² , measured @ 365 nm | 38 |

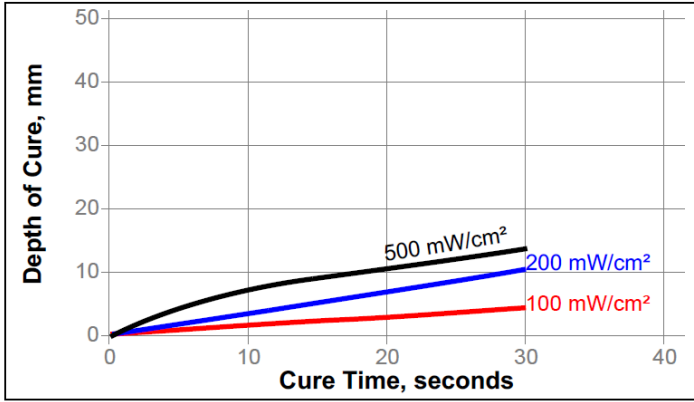
Depth of Cure vs. Irradiance (LED)

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



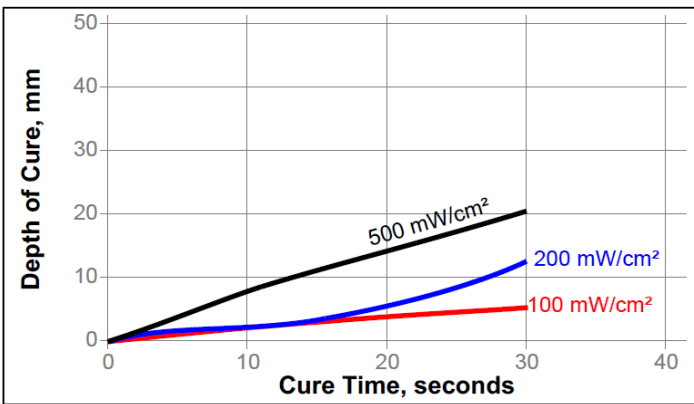
Curing System: Loctite® Indigo™ Cure Jet 405



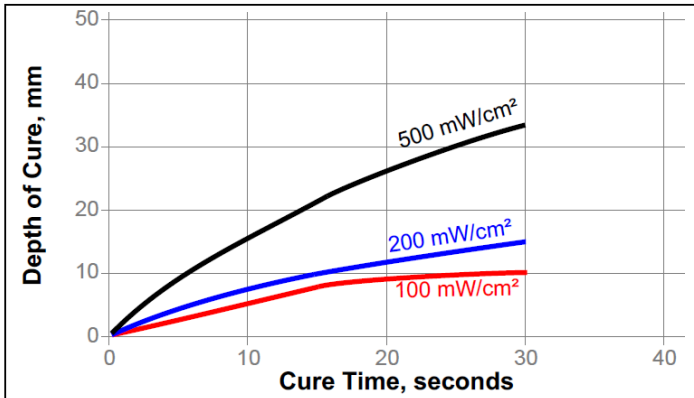
Depth of Cure vs. Irradiance (365 nm)

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

Curing System: Electrodeless, D bulb



Curing System: Electrodeless, V bulb



TYPICAL PERFORMANCE OF CURED MATERIAL

Cured @ 100 mW/cm², measured @ 365 nm, for 60 seconds using an electrodeless system, V bulb

Physical Properties:

Shore Hardness, ISO 868, Durometer A 90

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

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/mm ² 16 (psi) (2,280) |
| Tensile Modulus, ISO 527-3 | N/mm ² 33 (psi) (4,880) |

Electrical Properties:

| | |
|--|-----------------------|
| Surface Resistivity, IEC 60093, Ω | 1.25x10 ¹⁴ |
| Volume Resistivity, IEC 60093, Ω·cm | 1.1x10 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 |

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/mm ² 6.6 (psi) (960) |
|---------------------------------|--------------------------------------|

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/mm ² 13 (psi) (1,910) |
| Glass to Glass | N/mm ² 1.6 (psi) (230) |
| Glass to Steel | N/mm ² 2 (psi) (310) |
| Glass to Aluminum | N/mm ² 1.6 (psi) (230) |
| Glass to Stainless Steel | N/mm ² 0.6 (psi) (85) |
| Glass to Polycarbonate | N/mm ² 2.7 (psi) (400) |
| Polycarbonate to Aluminum | N/mm ² 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

Needle Pullout Strength:

| | |
|--|--------------------|
| Polycarbonate (gauge hubs); to Stainless Steel (Cannula) | N 19 (lb) (4.3) |
|--|--------------------|



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 and 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

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 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 adhesive can be wiped away with organic solvent.
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 Henkel 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/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

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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