Technical Data Sheet

LOCTITE® AA 3972™

Known as Loctite 3972
September 2020

PRODUCT DESCRIPTION

LOCTITE® AA 3972™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	UV acrylic
Appearance (uncured)	Transparent to hazy liquid[LMS]
Fluorescence	Positive under UV light[LMS]
Components	One component - requires no mixing
Viscosity	Medium
Cure	Ultraviolet (UV) / Visible light
Cure Benefit	Production - high speed curing
Application	Bonding

LOCTITE® AA 3972™ is suitable for a wide variety of applications that require fast cure and high adhesion to plasticized materials. LOCTITE® AA 3972™ 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 3972™ 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 on the cannulae before assembly with the hub, needles with large gaps, or cannulae that end in the core pinbore to minimize the potential for blocking cannulae.

ISO 10993

LOCTITE® AA 3972™ 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 1.06

Viscosity, Brookfield - RVT,25°C,mPa·s (cP):
Spindle 4, speed 20 rpm 2,800 to 6,500[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:
Black light:
6 mW/cm² , measured @ 365 nm ≤7[LMS]
Zeta® 7410 light source:
30 mW/cm² , measured @ 365 nm <5

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

Tack Free Time

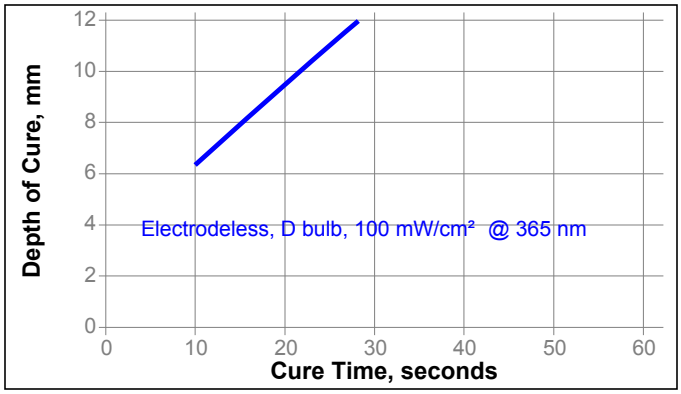
Tack Free Time is the time required to achieve a tack free surface

Tack Free Time, seconds:
Zeta® 7410:
30 mW/cm² , measured @ 365 nm, <5

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

Depth of Cure

The graph below shows the increase in depth of cure with time at 100mW/cm² as measured from the thickness of the cured product formed in an aluminum weighing dish.



TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 100 mW/cm² , measured @ 365 nm, for 30 seconds per side using an Electrodless system, D bulb

Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}:		
Pre Tg		122
Post Tg		202
Glass Transition Temperature, ISO 11359-2, °C		49
Water Absorption, ISO 62, %:		
2 hours in boiling water		7.2
7days in water @ 22 °C		8.3
Linear Shrinkage, in/in ASTM D 792,		1.9
Shore Hardness, ISO 868, Durometer D		68
Elongation, at break, ISO 527-3, %		88
Tensile Strength, ISO 527-3	N/mm²	23
	(psi)	(3,370)
Tensile Modulus, ISO 527-3	N/mm²	460
	(psi)	(66,750)

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured @ 1,000 mW/cm² , measured @ 365 nm, for 10 seconds using an Electrodeless system, D bulb

Needle Pullout Strength:

Material	22 Gauge Cannula		27 Gauge Cannula	
ABS	N	178	N	98
	(lb)	(40)	(lb)	(22)
Acrylic	N	182	N	102
	(lb)	(41)	(lb)	(23)
Polycarbonate	N	178	N	71
	(lb)	(40)	(lb)	(16)
Polyethylene	N	4	N	4
	(lb)	(1)	(lb)	(1)
Polyethylene (plasma treated)	N	169	N	102
	(lb)	(38)	(lb)	(23)
Polypropylene	N	13	N	9
	(lb)	(3)	(lb)	(2)
Polypropylene (plasma treated)	N	27	N	18
	(lb)	(6)	(lb)	(4)
Polystyrene	N	147	N	85
	(lb)	(33)	(lb)	(19)
Polyurethane	N	169	N	116
	(lb)	(38)	(lb)	(26)

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

Block Shear Strength, ISO 13445:

Polycarbonate to PVC	N/mm²	≥8.6[LMS]
	(psi)	(≥1,247)

Cured @ 100 mW/cm² , measured @ 365 nm, for 30 seconds.

Block Shear Strength, ISO 13445:

Acrylic to Glass	N/mm²	3.0
	(psi)	(430)
Acrylic to Acrylic	N/mm²	4.8
	(psi)	(690)
G-10 Epoxyglass to Glass	N/mm²	8.2
	(psi)	(1,190)
Nylon to Glass	N/mm²	2.3
	(psi)	(330)
Polybutylene Terephthalate to Glass	N/mm²	5.1
	(psi)	(740)
Polycarbonate to Polycarbonate	N/mm²	8.2
	(psi)	(1,190)
Polyvinylchloride to Glass	N/mm²	4.2
	(psi)	(610)
Aluminum (grit blasted) to Glass	N/mm²	10.8
	(psi)	(1,570)
Steel (grit blasted) to Glass	N/mm²	12.8
	(psi)	(1,850)

TYPICAL ENVIRONMENTAL RESISTANCE

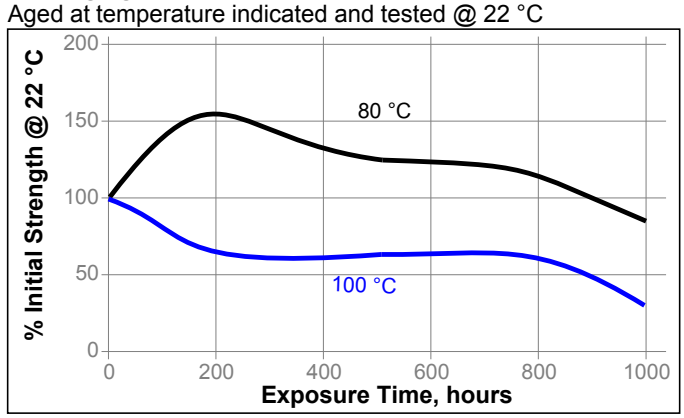
Cured @ 100 mW/cm² , measured @ 365 nm, for 30 seconds.

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.

		% of initial strength			
Environment	**°C**	**24 h**	**100 h**	**500 h**	**1000 h**
95% RH	40	-----	135	150	150
Water immersion	22	-----	130	95	125
Isopropanol	22	170	-----	-----	-----
Heptane	22	175	-----	-----	-----

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	70	55
27 Gauge Cannula	75	65

Polypropylene (plasma treated):

22 Gauge Cannula	85	85
27 Gauge Cannula	85	80
Polystyrene:		
22 Gauge Cannula	60	45
27 Gauge Cannula	45	45

Sterilization Resistance of Needle Assemblies
Sterilized as indicated and tested @ 22 °C
Needle Pullout Strength, % of initial strength:

	Gamma	ETO	Autoclave	
	30kGy	1 Cycle	1 Cycle	5 Cycles
Polycarbonate:				
22 Gauge Cannula	105	50	10	10
27 Gauge Cannula	90	55	25	10
Polypropylene (plasma treated):				
22 Gauge Cannula	100	115	65	65
27 Gauge Cannula	100	125	75	75
Polystyrene:				
22 Gauge Cannula	115	75	----	----
27 Gauge Cannula	105	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 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 January 28, 2011. 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 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

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Reference 1.3