Technical Data Sheet

LOCTITE® 4314™

February 2021

PRODUCT DESCRIPTION

LOCTITE® 4314™ provides the following product characteristics:

Technology	Cyanoacrylate
Chemical Type	Ethyl cyanoacrylate with photoinitiator
Appearance	Transparent Light Yellow Green to Dark Blue Green Liquid[LMS]
Fluorescence	Positive under UV light (Blue)[LMS]
Components	One part - requires no mixing
Viscosity	Low
Cure	Ultraviolet (UV) / Visible light
Secondary Cure	Humidity
Application	Bonding
Specific Benefits	• Flexible • LED Curable

LOCTITE® 4314™ is designed for bonding applications that require very rapid fixturing, fillet cure or surface cure. The light cure properties facilitate rapid curing of exposed surface areas thereby minimizing blooming and providing an alternative to solvent borne accelerators. This adhesive is designed to have increased flexibility over traditional cyanoacrylate adhesives making it especially suitable for flexible medical devices such as catheters & tube sets. However, it excels on a broad range of substrates including plastics, TPE's, rubbers, and metals.

ISO-10993

LOCTITE® 4314™ 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	1.07
Viscosity, Cone & Plate, mPa·s (cP):	
Physica MC100, Cone MK 22, shear rate 100 s^{-1}	100 to 250[LMS]

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.

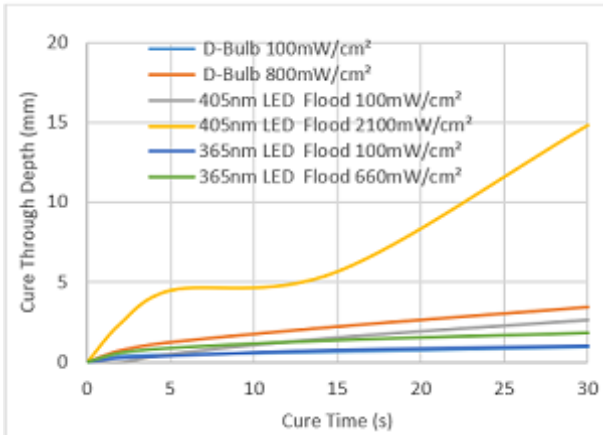
Stress Cracking, ASTM D 3929, minutes:

6.9 N/mm² stress on bar	>1,440
13.8 N/mm² stress on bar	480 to 1,440
20.7 N/mm² stress on bar	480 to 1,440

TYPICAL CURING PERFORMANCE

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.



Tack Free Time / Surface Cure

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

UV/Visible Light Sources:

Electrodeless, D bulb: 30 mW/cm² , measured @ 365 nm	≤10[LMS]
Electrodeless, D bulb: 1,000 mW/cm² , measured @ 365 nm	≤1
LOCTITE CL30 405nm LED Flood: 1,900 mW/cm² , measured @ 405 nm	≤1
LOCTITE CL30 380nm LED Flood: 980 mW/cm² , measured @ 365 nm	≤1
LOCTITE CL30 365nm LED Flood: 630 mW/cm² , measured @ 365 nm	≤1

Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The table below shows the fixture time achieved on different materials at 22 °C / 50 % relative humidity. This is defined as the time to develop a shear strength of 0.1 N/mm² . Fixture time measurements relate to non-UV cure.

Fixture Time, seconds:

Aluminum (grit blasted)	60 to 120
ABS	0 to 5
Polycarbonate	10 to 20
HDPE (treated with LOCTITE® SF 7701 primer)	30 to 45
Mild Steel	300 to 360

TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 100 mW/cm² , measured @ 405 nm, for 30 seconds per side using an Electrodless system, D bulb.

Physical Properties:

Linear Shrinkage, ASTM D 792, %		2.2
Specific Gravity @ 25 °C		1.16
Glass Transition Temperature, ASTM E 228, °C		70
Shore Hardness, ISO 868, Durometer D		74
Elongation, at break, ISO 527-3, %		17
Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}:		
Pre Tg		82×10^{-6}
Post Tg		379×10^{-6}
Glass Transition Temperature (Tg), °C		70
Water Absorption, ISO 62, %:		
2 hours in boiling water		10.1
Tensile Strength, ISO 527-3	N/mm² (psi)	25 (3,600)
Tensile Modulus, ISO 527-3	N/mm² (psi)	1,550 (225,000)

Electrical Properties:

Dielectric Breakdown Strength, IEC 60243-1, kV/mm		35

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured @ 1.7 W/cm² , measured @ 405 nm for 2 seconds using a LOCTITE CL30 405nm LED Flood light source

Block Shear Strength, ISO 13445:

Acrylic to Acrylic	N/mm² (psi)	7.3 (1,060)
Polycarbonate to Polycarbonate	N/mm² (psi)	22 (2,050)
Polycarbonate to Steel	N/mm² (psi)	4 (580)
HDPE (treated with LOCTITE® SF 7701™ primer)*	N/mm² (psi)	0.9 (130)
LDPE (treated with LOCTITE® SF 7701™ primer)*	N/mm² (psi)	2.8 (410)
Polypropylene (treated with LOCTITE® SF 7701™ primer)*	N/mm² (psi)	6.3 (910)
HDPE (plasma treated)	N/mm² (psi)	3.5 (500)
LDPE (plasma treated)	N/mm² (psi)	4.9 (710)
Polypropylene (plasma treated)	N/mm² (psi)	1.1 (160)
Polycarbonate to Stainless Steel	N/mm² (psi)	3.4 (490)
Polycarbonate to TPU	N/mm² (psi)	1.3 (190)
Polycarbonate to Plasticized PVC	N/mm² (psi)	1.1 (150)
Polycarbonate to Plasticized PVC (aged 12 days @ 60°C)	N/mm² (psi)	1.2 (170)
	(psi)	(530)

* Select Samples cured @ 150 mW/cm² , measured @ 405 nm , for 5 seconds using a LOCTITE CL30 405 nm LED Flood light source followed by 7 days at room temperature.

Cured @ 1.7 W/cm² , measured @ 365 nm for 2 seconds using a LOCTITE CL30 405nm LED Flood light source

Lap Shear Strength, ISO 4587:

Polycarbonate to Aluminum	N/mm²	3.6

Cured for 72 hours @ 23°C / 50% RH

180° Peel Strength, ISO 8510-2:

Steel (grit blasted)	N/mm (lb/in)	2.9 (16)
Side Impact Resistance, J		10.5

TYPICAL ENVIRONMENTAL RESISTANCE

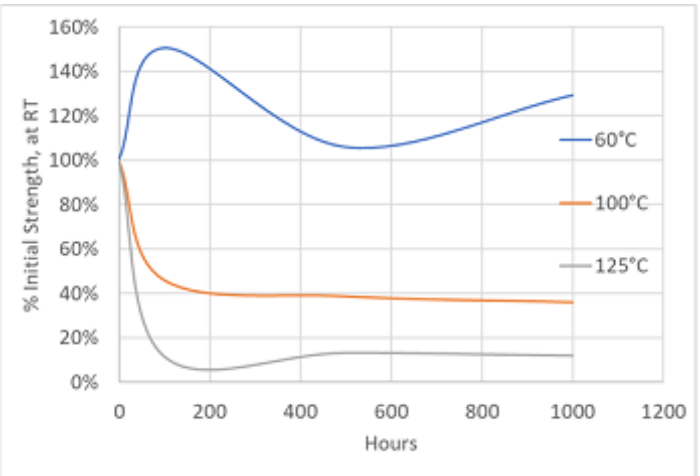
Cured @ 1.7 W/cm² , measured @ 365 nm for 2 seconds using a LOCTITE CL30 405nm LED Flood light source

Block Shear Strength, ISO 13445:

Polycarbonate

Heat Aging

Aged at temperature and condition indicated and tested @ 22 °C



Chemical/Solvent Resistance

aged under conditions indicated and tested @ 22°C
***Note:** Substrate failure for all test specimens**

		% of initial strength			
Environment	**°C**	**2 h**	**24 h**	**100 h**	**1000 h**
Water	100	24	--	--	--
Diluted Bleach (40:1)	22	130	141	--	--
Water	22	--	--	145	114
Relative Humidity 90%	40	--	--	184	156
Heptane	22	--	--	161	132
IPA	22	--	--	166	159

Sterilization Resistance of Needle Assemblies

Sterilized as indicated and tested @ 22 °C

Shear Strength (Block shear), % of initial strength:

	Gamma	**ETO**	**ETO**
	30kGy	1 Cycle	2 Cycles
Steel to PC	59	70	44

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. For best performance bond surfaces should be clean and free from grease.
3. Excess adhesive can be dissolved with Loctite cleanup solvents, nitromethane or acetone.

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.
Optimal Storage: 2 °C to 8 °C. Storage below 2 °C or greater than 8 °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. Please contact a Henkel representative for more information.

Approval and Certificate

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

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

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Reference 1.0