Technical Data Sheet

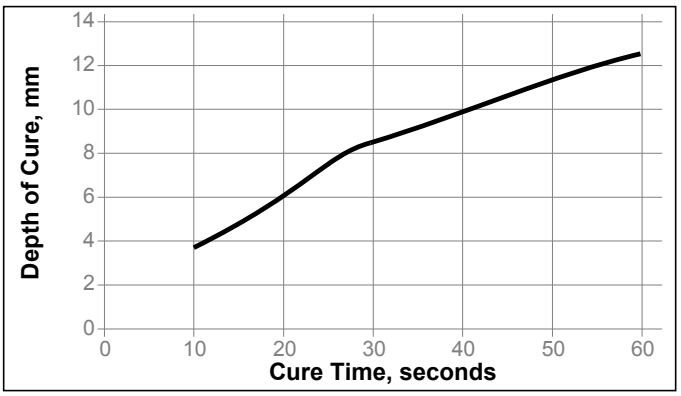
LOCTITE® 4306™

September 2020

PRODUCT DESCRIPTION

LOCTITE® 4306™ provides the following product characteristics:

Technology	Cyanoacrylate/UV
Chemical Type	Ethyl cyanoacrylate with photoinitiator
Appearance	Transparent, light yellow-green to dark blue-green liquid[LMS]
Fluorescence	Positive under UV light[LMS]
Components	One part - requires no mixing
Cure	Ultraviolet (UV) / Visible light
Secondary Cure	Humidity
Application	Bonding
Key Substrates	Plastics, Rubbers and Metals



LOCTITE® 4306™ is designed for bonding applications that require very rapid fixturing, fillet cure or surface cure. The UV light cure properties facilitate rapid curing of exposed surface areas thereby minimizing blooming and providing an alternative to solvent borne accelerators. Suitable for use in the assembly of **disposable medical devices**.

ISO-10993

LOCTITE® 4306™ 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 1.05

Flash Point - See SDS

Viscosity, Cone & Plate, mPa·s (cP):
Temperature: 25 °C, Shear Rate: 3,000 s^{-1} 10 to 35[LMS]

TYPICAL CURING PERFORMANCE

Primary Cure Mechanism, UV

Depth of Cure:
Electrodeless, D bulb, 100 mW/cm² , measured @ 365 nm

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:
100 mW/cm² , measured @ 365 nm ≤5

Zeta® 7400:
30 mW/cm² , measured @ 365 nm ≤5

Electrodeless, H bulb:
30 mW/cm² , measured @ 365 nm ≤10[LMS]

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:

ABS	5 to 10
Acrylic	5 to 10
Aluminum (etched)	20 to 30
Neoprene	≤5
Phenolic	30 to 45
Polycarbonate	30 to 45
Polyethylene	>300
Polyethylene (Primer 770)	5 to 10
Polypropylene	>300

Polypropylene (Primer 770)	≤5
PVC	90 to 105
Steel (grit blasted)	≤5

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		92×10^{-6}
Glass Transition Temperature, ASTM E 228, °C		116
Shore Hardness, ISO 868, Durometer D		82
Volume Shrinkage, ASTM D 792, %		16
Water Absorption, ISO 62, %:		
2 hours in boiling water		2.0
7days in water @ 22 °C		1.1
Elongation, at break, ISO 527-3, %		2.2
Tensile Strength, ISO 527-3	N/mm² (psi)	32.5 (4,720)
Tensile Modulus, ISO 527-3	N/mm² (psi)	1,730 (250,700)

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured @ 30 mW/cm² , measured @ 365 nm, for 10 seconds

Block Shear Strength, ISO 13445:

Polycarbonate	N/mm² (psi)	≥9.0[LMS] (≥1,305)

Cured @ 100 mW/cm² , measured @ 365 nm, for 10 seconds.

Block Shear Strength, ISO 13445:

Acrylic to Glass	N/mm² (psi)	2.3 (320)
Acrylic to Acrylic	N/mm² (psi)	13.6 (1,970)
G-10 Epoxy to Glass	N/mm² (psi)	5.0 (725)
Nylon to Glass	N/mm² (psi)	1.1 (160)
Polybutylene Terephthalate to Glass	N/mm² (psi)	3.7 (540)
Polycarbonate to Polycarbonate	N/mm² (psi)	15.2 (2,200)
PVC to Glass	N/mm² (psi)	1.8 (260)
Aluminum (grit blasted) to Glass	N/mm² (psi)	10.9 (1,590)
Steel (grit blasted) Glass	N/mm² (psi)	10.1 (1,460)

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

Needle Pullout Strength:

Material	22 Gauge Cannula	27 Gauge Cannula
ABS	N 138 (lb) (31)	N 31 (lb) (7)
Acrylic	N 191 (lb) (43)	N 13 (lb) (3)
Polycarbonate	N 245 (lb) (55)	N 89 (lb) (20)
Polyethylene	N 40 (lb) (9)	N 18 (lb) (4)
Polyethylene (plasma treated)	N 98 (lb) (22)	N 44 (lb) (10)
Polypropylene	N 18 (lb) (4)	N 9 (lb) (2)
Polypropylene (plasma treated)	N 53 (lb) (12)	N 22 (lb) (5)
Polystyrene	N 98 (lb) (22)	N 9 (lb) (2)
Polyurethane	N 98 (lb) (22)	N 49 (lb) (11)

TYPICAL ENVIRONMENTAL RESISTANCE

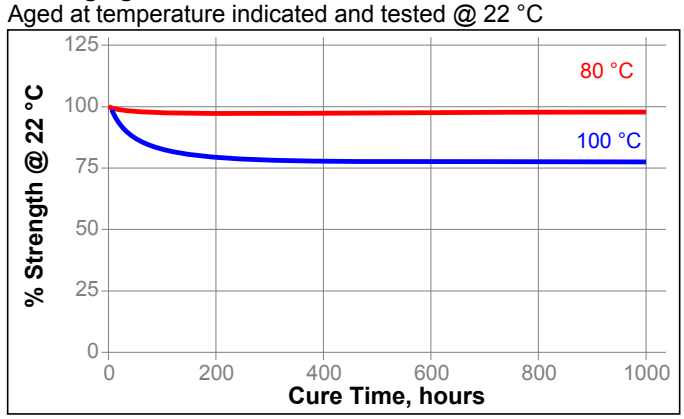
Cured @ 30 mW/cm² , measured @ 365 nm, for 10 seconds.

Block Shear Strength, ISO 13445:

Polycarbonate

Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

		% of initial strength			
Environment	**°C**	**24 h**	**100 h**	**500 h**	**1000 h**
Water	22	------	140	115	110
95% RH	40	------	115	100	100
Heptane	22	105	------	------	------
Isopropanol	22	110	------	------	------

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	100	100
27 Gauge Cannula	90	60
Polypropylene (plasma treated):		
22 Gauge Cannula	100	40
27 Gauge Cannula	80	80
Polystyrene:		
22 Gauge Cannula	60	70
27 Gauge Cannula	100	100

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	55	75	45	25
27 Gauge Cannula	30	40	15	25
Polypropylene (plasma treated):				
22 Gauge Cannula	75	90	40	50
27 Gauge Cannula	80	100	40	80
Polystyrene:				
22 Gauge Cannula	65	55	N/A	N/A
27 Gauge Cannula	50	150	N/A	N/A

N/A = Not available. The polystyrene was not compatabile with the autoclave sterilization process.

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.

Loctite Material Specification[LMS]
LMS dated March 03, 2003. 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: 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 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

Reference 1.4