Technical Data Sheet

LOCTITE® 4305

December 2022

PRODUCT DESCRIPTION

LOCTITE® 4305 provides the following product characteristics:

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

LOCTITE® 4305 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

An ISO 10993 Test Protocol is an integral part of the Quality Program for LOCTITE® 4305. LOCTITE® 4305 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.

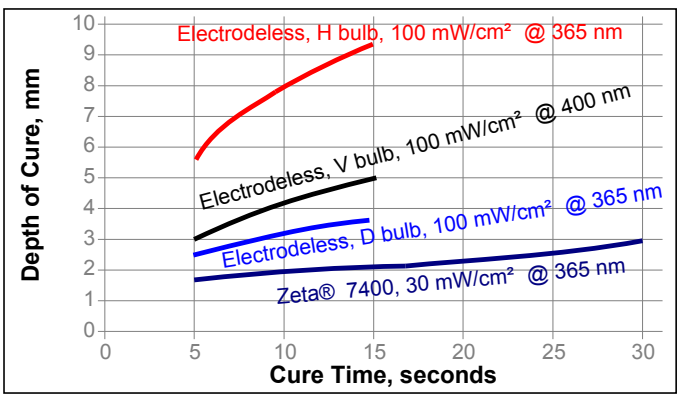
TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.07
Flash Point - See SDS	
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Shear rate 100 s^{-1}	600 to 1,200

TYPICAL CURING PERFORMANCE

Primary Cure Mechanism, UV

Depth of Cure



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, V bulb:	
100 mW/cm² , measured @ 400 nm	≤5
Electrodeless, H bulb:	
30 mW/cm² , measured @ 365 nm	≤10
100 mW/cm² , measured @ 365 nm	≤5
Zeta® 7400:	
30 mW/cm² , measured @ 365 nm	≤5

Effect of Substrate Transparency and Light Source

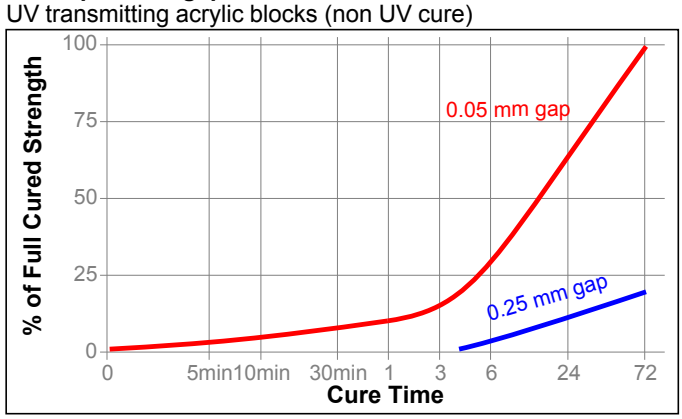
Zeta® 7400, 30 mW/cm² , measured @ 365 nm, for 10 seconds and Electrodeless, V bulb, 100 mW/cm² , measured @ 400 nm for 10 seconds

Material	Bulb	Post UV Cure		
UV Blocking Polycarbonate	Zeta® 7400	2 minutes @ 22 °C	N/mm² (psi)	12.7 (1,840)
	Zeta® 7400	24 hours @ 22 °C	N/mm² (psi)	15.7 (2,280)
	Electrodeless, V bulb	2 minutes @ 22 °C	N/mm² (psi)	15.7 (2,280)
	Electrodeless, V bulb	24 hours @ 22 °C	N/mm² (psi)	16.6 (2,410)
UV Transmitting Polycarbonate	Zeta® 7400	2 minutes @ 22 °C	N/mm² (psi)	17.3 (2,510)
	Zeta® 7400	24 hours @ 22 °C	N/mm² (psi)	17.2 (2,490)
	Electrodeless, V bulb	2 minutes @ 22 °C	N/mm² (psi)	18.7 (2,380)
	Electrodeless, V bulb	24 hours @ 22 °C	N/mm² (psi)	20.6 (2,980)

Secondary Cure Mechanism, Humidity

Cure speed vs. gap

UV transmitting acrylic blocks (non UV cure)



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	10 to 20
Aluminum (etched)	≤5
Neoprene	≤5
Phenolic	105 to 150
Polycarbonate	20 to 30
Polyethylene	≥300
Polyethylene (Primer 770)	≤5
Polypropylene	≥300
Polypropylene (Primer 770)	≤5
PVC	105 to 120
Steel (grit blasted)	30 to 45

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TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 100 mW/cm² , measured @ 400 nm for 10 seconds per side. , using an Electrodeless system, V bulb, plus 24 hours post cure @ 22 °C.

Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}		74.7×10^{-6}
Glass Transition Temperature, ASTM E 228, °C		106
Volume Shrinkage, ASTM D 792, %		12.8
Shore Hardness, ISO 868, Durometer D		77
Elongation, at break, ISO 527-3, %		5.5
Tensile Strength, at break, ISO 527-3	N/mm² (psi)	42 (6,090)
Tensile Modulus, ISO 527-3	N/mm² (psi)	1,700 (246,565)

Cured @ 100 mW/cm² , measured @ 365 nm, for 10 secondsper side using an Electrodeless system, V bulb plus 24 hours @ 22 °C, (Cured sheets 0.63 mm thick)

Electrical Properties:

Volume Resistivity, IEC 60093, Ω·cm	7.43×10^{15}
Surface Resistivity, IEC 60093, Ω	1.38×10^{15}
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	33.5
Dielectric Constant / Dissipation Factor, IEC 60250:	
0.1 kHz	3.95 / 0.041
1 kHz	3.67 / 0.041
10 kHz	3.52 / 0.037

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 72 hours @ 22 °C (non-UV cure)

Block Shear Strength, ISO 13445:

ABS	N/mm² (psi)	35.7 (5,170)
Acrylic	N/mm² (psi)	14.1 (2,050)
Aluminum (etched)	N/mm² (psi)	17.9 (2,600)
Neoprene	N/mm² (psi)	0.8 (115)
Phenolic	N/mm² (psi)	8.2 (1,190)
Polycarbonate	N/mm² (psi)	14.1 (2,050)
Polyethylene	N/mm² (psi)	0.4 (60)
Polypropylene	N/mm² (psi)	0.3 (45)
PVC	N/mm² (psi)	32.7 (4,740)
Steel (grit blasted)	N/mm² (psi)	22.5 (3,265)

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

Block Shear Strength, ISO 13445:

Polycarbonate	N/mm² (psi)	≥9 (≥1,305)

TYPICAL ENVIRONMENTAL RESISTANCE

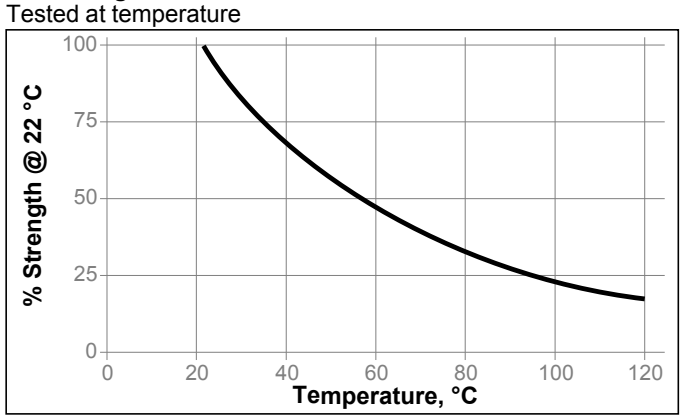
Cured @ 30 mW/cm² , measured @ 365 nm, for 10 seconds using a Zeta® 7400 light source plus 24 hours post cure @ 22 °C.

Block Shear Strength, ISO 13445:

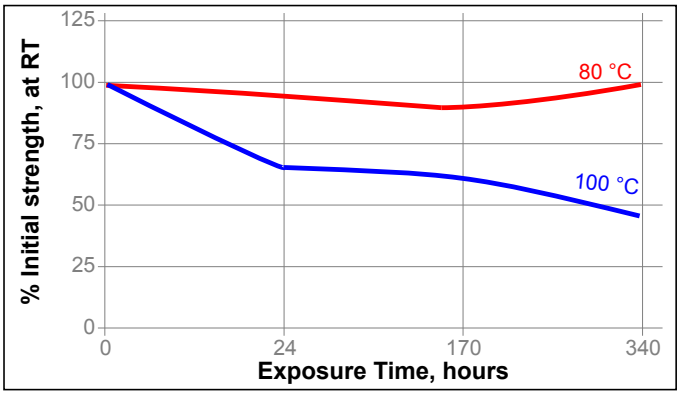
Polycarbonate

Hot Strength

Tested at temperature



Heat Aging
Aged at temperature indicated and tested @ 23 °C



Chemical/Solvent Resistance
Aged under conditions indicated and tested @ °C

		% of initial strength		
Environment	**°C**	**24 h**	**170 h**	**500 h**
Motor oil (MIL-L-46152)	22	100	105	115
Water	22	95	105	100
Isopropanol	22	95	100	120
Humidity, 100% RH	40	105	105	105

Effects of Sterilization
In general, products similiar in composition to LOCTITE® 4305 subjected to standard sterilization methods, such as EtO and Gamma Radiation (25 to 50 kiloGrays cumulative) show excellent bond strength retention. LOCTITE® 4305 maintains bond strength after 1 cycle of steam autoclave. It is recommended that customers test specific parts after subjecting them to the preferred sterilization method. Consult with Loctite® for a product recommendation if your device will see more than 3 sterilization cycles.

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. This product performs best in thin bond gaps (0.05 mm).
4. Excess adhesive can be dissolved with Loctite cleanup solvents, nitromethane or acetone.

Loctite Material Specification[LMS]
LMS dated November 17, 2004. 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 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

Disclaimer
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Reference 1.6