LOCTITE® 5055™

July 2010

PRODUCT DESCRIPTION

LOCTITE® 5055™ provides the following product characteristics:

Technology	Silicone
Chemical Type	Alkoxy silicone
Appearance (uncured)	Light yellow, transparent liquid[LMS]
Components	One component - requires no mixing
Cure	Ultraviolet (UV)/ visible light
Application	• Bonding • Potting • Coating • Sealing

LOCTITE® 5055™ is a one-component, (UV) visible light curable silicone adhesive specifically designed for use in assembly of disposable medical devices. It is a low viscosity high performance silicone adhesive that upon exposure to light, cures into a tough transparent silicone rubber .

ISO-10993

An ISO 10993 Test Protocol is an integral part of the Quality Program for LOCTITE® 5055™. LOCTITE® 5055™ 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 @ °C	0.98
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 2, speed 20 rpm	200 to 850[LMS]
Flash Point - See MSDS	

TYPICAL CURING PERFORMANCE

Normal processing conditions will include exposure to sufficient UV light irradiance to effectively cure the material. This product requires UV light of 254nm to promote a tack free surface.

Tack Free Time

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

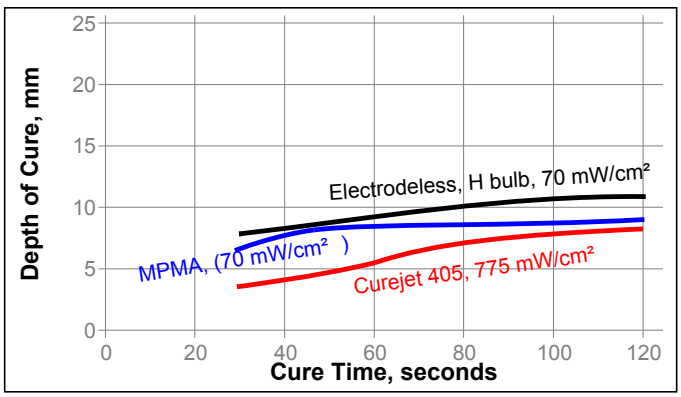
Tack Free Time, seconds:	
, Zeta® 7200:	
70 mW/cm² , measured @ 365 nm	≤30[LMS]
Zeta® 7215:	
70 mW/cm² , measured @ 365 nm	30
Electrodeless, D bulb:	
70 mW/cm² , measured @ 365 nm	120
Electrodeless, H bulb:	
70 mW/cm² , measured @ 365 nm	30

Depth of Cure

Depth of cure (cure time 60 seconds), mm:
70 mW/cm² , measured @ 365 nm, using a Zeta® 7200 light source: ≥4[LMS]

Depth of Cure (light)

Rapid depth of cure can be attained with focused UV and/or visible light. The following graph shows the cure response of some typical light sources as a function of time.



TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 70 mW/cm² , measured @ 365 nm for 60 seconds

Physical Properties:

Shore Hardness, ISO 868, Durometer A		45 to 65[LMS]
Elongation, at break, ISO 527-3, %		>80[LMS]
Tensile Strength, ISO 527-3	N/mm²	>6.0[LMS]
	(psi)	(>870)

Cured @ 70 mW/cm² , measured @ 365 nm for 60 seconds per side, using a medium pressure mercury arc light source, followed by 24 hours @ 22 °C, / 50±5% RH

Physical Properties:

Shore Hardness, ISO 868, Durometer A		57
Elongation, at break, ISO 527-3, %		161
Tensile Strength, at break, ISO 527-3	N/mm²	9.3
	(psi)	(1,350)

Compression Set, ASTM D 395, Method B, %:

Aged @ 22 °C for 24 hours	7.9
Aged @ 70 °C for 24 hours	41.7
Aged @ 121 °C for 24 hours	92
Aged @ 150°C for 24 hours	92.5

Gas Permeability, ASTM D1434, cm² /sec/atm:

Helium	3.88×10^{-06}
Carbon Dioxide	1.40×10^{-05}
Oxygen	2.11×10^{-06}

Electrical Properties:

Dielectric Breakdown Strength, IEC 60243-1, kV/mm	15.3

Dielectric Constant / Dissipation Factor, IEC 60250:

1 kHz	2.8 / 0.03
10 MHz KHz	2.8 / 0.004
100 KHz	2.8 / 0.006
1 MHz	2.7 / 0.006
10 MHz	2.8 / 0.01

Volume Resistivity, IEC 60093, Ω·cm 1.10×10^{15}

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

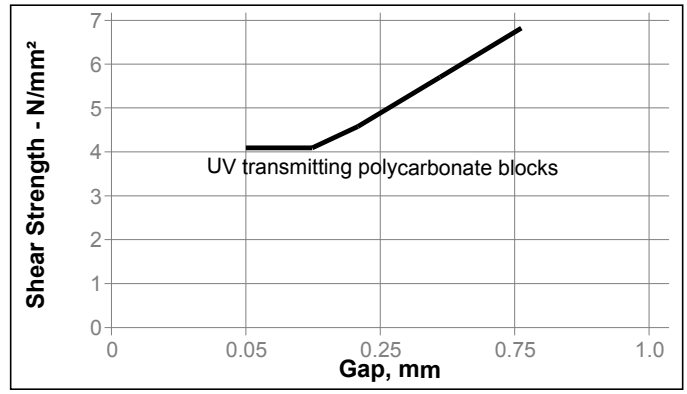
Cured @ 70 mW/cm² , measured @ 365 nm for 60 seconds per side, using a Loctite® ZETA® 7215™ UV Chamber (MPMA), plus 24 hours @ 22 °C, / 50±5% RH

Lap Shear Strength, ISO 4587:

Aluminum to Glass	N/mm²	2.4
	(psi)	(355)
Steel to Glass	N/mm²	2.7
	(psi)	(400)
Polycarbonate (UV Transmitting) to Polycarbonate (UV Transmitting)	N/mm²	4
	(psi)	(590)
Polycarbonate (UV Transmitting) to Glass	N/mm²	2
	(psi)	(290)
Polycarbonate (UV Transmitting) to Aluminum	N/mm²	4.5
	(psi)	(650)
Polycarbonate (UV Transmitting) to Steel	N/mm²	2.6
	(psi)	(380)
Polycarbonate (UV Transmitting) to PVC	N/mm²	3.2
	(psi)	(460)
Polycarbonate (UV Transmitting) to PBT	N/mm²	3.6
	(psi)	(520)
Polycarbonate (UV Transmitting) to ABS	N/mm²	3.7
	(psi)	(540)
Polycarbonate (UV Transmitting) to Nylon	N/mm²	4
	(psi)	(580)
Glass to PVC	N/mm²	2.3
	(psi)	(330)
Glass to PBT	N/mm²	1.9
	(psi)	(270)
Glass to ABS	N/mm²	2.3
	(psi)	(340)
Glass to Nylon	N/mm²	1.3
	(psi)	(190)

Shear Strength vs. Gap Thickness

Cured @ 70 mW/cm² , measured @ 365 nm for 60 seconds using a medium pressure mercury arc light source plus 24 hours @ 22 °C, / 50±5% RH



TYPICAL ENVIRONMENTAL RESISTANCE

Cured @ 70 mW/cm² , measured @ 365 nm, for 60 seconds per side, using a Loctite® ZETA® 7215™ UV Chamber (MPMA), followed by 24 hours @ 22 °C, / 50±5% RH

Heat Aging

Aged at temperature indicated and tested @ 22 °C

Aged @ 177 °C for 168 hours:

Change in Durometer, Points (Initial = 57)	-22
Change in Tensile Strength, %	-64
Change in Elongation, %	-24
Weight Loss, %	21.7

Typical Fluid Immersion Properties

Aged @ 100 °C for 168 hours:

glycol/water, 50:50:

Change in Durometer, Points (Initial = 57)	-10
Change in Tensile Strength, %	-14
Change in Elongation, %	-9
Volume Swell, %	-0.3

5W30 oil:

Change in Durometer, Points (Initial = 57)	-17
Change in Tensile Strength, %	-76
Change in Elongation, %	27

ATF:

Change in Durometer, Points (Initial = 57)	-39
Change in Tensile Strength, %	-87
Change in Elongation, %	34

Aged @ 150 °C for 168 hours:

glycol/water, 50:50:

Change in Durometer, Points (Initial = 57)	-23
Change in Tensile Strength, %	-57
Change in Elongation, %	-31

5W30 oil:	
Change in Durometer, Points (Initial = 57)	-38
Change in Tensile Strength, %	-92
Change in Elongation, %	21
Volume Swell, %	78
ATF:	
Change in Durometer, Points (Initial = 57)	-57
Change in Tensile Strength, %	-97
Change in Elongation, %	16
Volume Swell, %	108

Sterilization Resistance

Cured @ 70 mW/cm² , measured @ 365 nm for 30 seconds per side, using a medium pressure mercury arc light source plus 24 hours @ 22 °C, / 50±5% RH

% of initial strength:

	Gamma 30kGy	ETO 1 Cycle	Autoclave 1 Cycle
Polycarbonate (UV Transmitting)	100	100	100

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 Material Safety Data Sheet (MSDS).

Directions for use:

1. For best performance bond surfaces should be clean and free from grease.
2. The product is designed to be initially cured by UV/visible light at a minimum irradiance of 70 mW/cm2 for approximately 60 seconds, increased exposure may be required for curing deeper sections.
3. Functional strength is achieved almost instantly.
4. Full performance properties will develop over 72 hours.
5. Excess material can be easily wiped away with non-polar solvents.

Loctite Material Specification[LMS]

LMS dated January 28, 2010. 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 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

Note

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Trademark usage

Reference 0.2