Technical Data Sheet

LOCTITE® 4902

December 2020

PRODUCT DESCRIPTION

LOCTITE® 4902 provides the following product characteristics:

Technology	Cyanoacrylate
Chemical Type	Ethyl and octyl cyanoacrylate
Appearance	Clear colorless liquid
Components	One part - requires no mixing
Viscosity	Low
Cure	Humidity
Application	Assembly of disposable medical devices.
Key Substrates	Plastics, Rubbers and Metals

LOCTITE® 4902 is a highly flexible cyanoacrylate adhesive designed for the assembly of flexible medical devices. This product facilitates the use of dissimilar and opaque substrates while improving device performance. LOCTITE® 4902 offers significant performance enhancements compared to standard cyanacrylates, including strength in flexing bond lines and resistance to leaks with excellent sealing capability. Known performance advantages of cyanoacrylates are maintained, including speed, ease of use and strength.

ISO-10993

An ISO 10993 Test Protocol is an integral part of the Quality Program for LOCTITE® 4902. LOCTITE® 4902 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	1.03
Flash Point - See SDS	
Viscosity, Cone & Plate, mPa·s (cP):	
Temperature: 25 °C, Shear Rate: 100 s^{-1}	150 to 250

TYPICAL CURING PERFORMANCE

Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The time to develop a shear strength of 0.1 N/mm² on different materials at 22 °C and 50% relative humidity

Fixture Time, seconds:	
Aluminium	≤20
ABS	<5 to 10
Acrylic	30 to 45
Neoprene	120 to 210
Nitrile	20 to 45
Polycarbonate	5 to 10
PVC	15 to 45
Steel	10 to 30

Cure Speed vs. Bond Gap

The rate of cure will depend on the bondline gap. Thin bond lines result in high cure speeds, increasing the bond gap will decrease the rate of cure.

Cure Speed vs. Humidity

The rate of cure will depend on the ambient relative humidity. Higher relative humidity levels result in more rapid speed of cure.

Cure Speed vs. Activator

Where cure speed is unacceptably long due to large gaps, applying activator to the surface may improve cure speed. However, this can reduce ultimate strength of the bond and therefore testing is recommended to confirm effect.

TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 7days @ 22°C

Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}:		
Below Tg		110×10^{-06}
Above Tg		425×10^{-06}
Glass Transition Temperature ISO 11359-2, °C		50
Shore Hardness, ISO 868 , Shore A		65
Tensile Modulus	N/mm²	400
	(psi)	(57,900)

Electrical Properties:

Surface Resistivity, IEC 60093, ohms	145×10^{15}
Volume Resistivity, IEC 60093, ohm-cm	11×10^{15}
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	32
Dielectric Constant / Dissipation Factor, IEC 60250:	
@ 1 KHz	3.34/0.04
@ 1 MHz	2.86/0.04
@ 10 MHz	2.76/0.04

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 24 hours @ 22°C / 50% RH

Lap Shear Strength, :

Grit Blasted Mild Steel (GBMS)	N/mm²	≥10.3
	(psi)	(≥1,495)

Cured for 72 hours @ 22°C / 50% RH

Tensile Strength, ISO 6922:

Buna-N	N/mm²	16
	(psi)	(2,250)

Lap Shear Strength, :

Grit Blasted Mild Steel (GBMS)	N/mm²	12
	(psi)	(1,745)
Aluminum (etched)	N/mm²	14
	(psi)	(2,000)
Nitrile	N/mm²	0.4
	(psi)	(65)
Neoprene	N/mm²	0.6
	(psi)	(83)
ABS	* N/mm²	8
	* (psi)	(1,160)
PMMA	* N/mm²	4.3
	* (psi)	(625)
Polycarbonate	N/mm²	7.9
	(psi)	(1,150)
PVC	* N/mm²	5.8
	* (psi)	(840)

* substrate failure

Block Shear Strength, ISO 13445:

ABS	N/mm²	25
	(psi)	(3,675)
PVC	N/mm²	4
	(psi)	(575)
Acrylic	N/mm²	8
	(psi)	(1,190)
Polycarbonate	N/mm²	15
	(psi)	(2,220)

TYPICAL ENVIRONMENTAL RESISTANCE

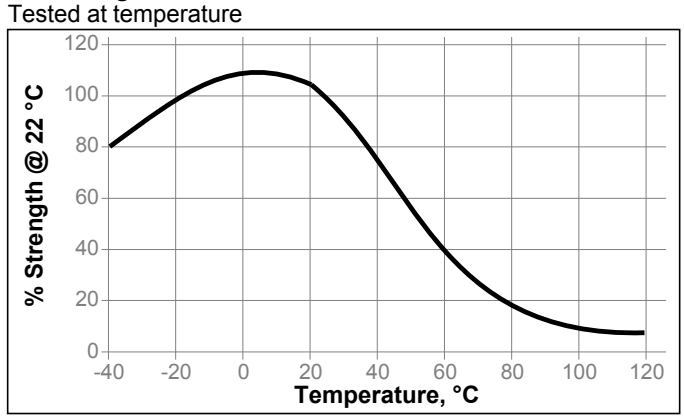
Cured for 72 hours @ 22°C / 50% RH

Lap Shear Strength, :

Grit Blasted Mild Steel (GBMS)

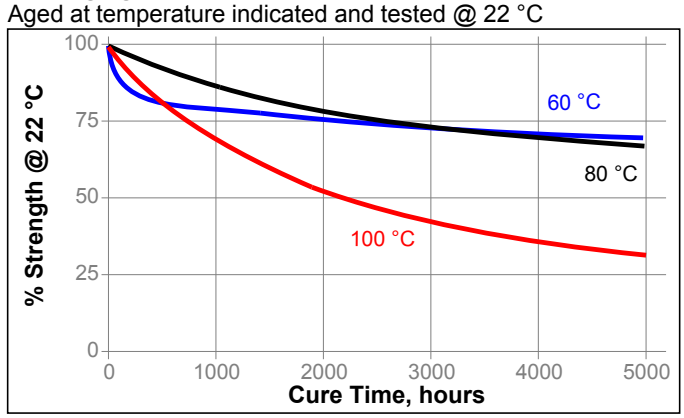
Hot Strength

Tested at temperature



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**	**100 h**	**500 h**	**1000 h**	**5000 h**
Motor oil	40	85	70	65	60
Unleaded gasoline	22	65	10	25	0
Ethanol	22	75	45	15	0
Isopropanol	22	80	105	110	20
Water	22	70	65	60	45
98% RH, 40°C	40	55	50	65	50

Block Shear Strength, ISO 13445:

Polycarbonate

Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22°C

		% of initial strength			
Environment	**°C**	**100 h**	**500 h**	**1000 h**	**5000 h**
Air	22	80	95	140	105
98% RH, 40°C	40	140	140	150	140

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

	Gamma	ETO	Autoclave	
	30kGy	1 Cycle	1 Cycle	5 Cycles
Polycarbonate	115	110	130	125

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. Bond areas should be clean and free from grease. Clean all surfaces with a Loctite® cleaning solvent and allow to dry.
2. To improve bonding on low energy plastic surfaces, Loctite® Primer may be applied to the bond area. Avoid applying excess Primer. Allow the Primer to dry.
3. LOCTITE® Activator may be used if necessary. Apply the LOCTITE® Activator to one bond surface (do not apply activator to the primed surface where Primer is also used). Allow the Activator to dry.
4. Apply adhesive to one of the bond surfaces (do not apply the adhesive to the activated surface). Do not use items like tissue or a brush to spread the adhesive. Assemble the parts within a few seconds. The parts should be accurately located, as the short fixture time leaves little opportunity for adjustment.
5. LOCTITE® Activator can be used to cure fillets of product outside the bond area. Spray or drop the activator on the excess product.
6. Bonds should be held fixed or clamped until adhesive has fixtured.
7. Product should be allowed to develop full strength before subjecting to any service loads (typically 24 to 72 hours after assembly, depending on bond gap, materials and ambient conditions).
8. This product performs best in thin bond gaps (0.05 mm / 2 mil).

Loctite Material Specification[LMS]
LMS dated October 30, 2013. 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 0.1