

LOCTITE[®] EA 9509

February 2020

PRODUCT DESCRIPTION

LOCTITE[®] EA 9509 provides the following product characteristics:

Technology	Epoxy
Chemical Type	Epoxy
Appearance (Mixed)	Off-white
Components	One-component
Viscosity	Self-levelling
Cure	Heat cure
Application	Bonding
Maximum Gap Fill	0.1 mm

LOCTITE[®] EA 9509 is a single component, heat curing epoxy adhesive. It has excellent chemical and solvent resistance and can be used in high operating temperature environments. Its viscosity characteristics ensure it is self levelling and can be applied by roller.

TYPICAL PROPERTIES OF UNCURED MATERIAL

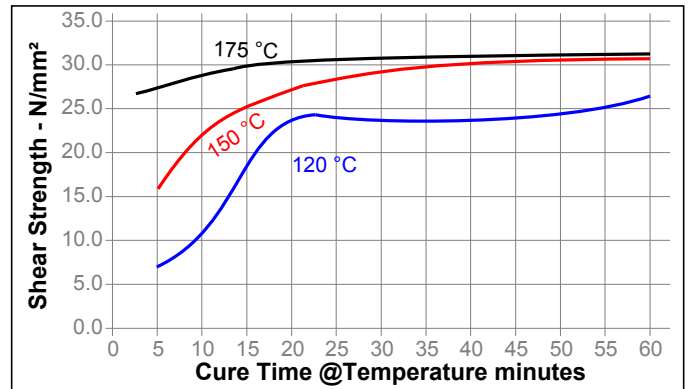
Viscosity @ 25°C, Pa·s (cP):	24 to 55
Casson Viscosity	
Specific Gravity @ 25°C:	1.47 to 1.53
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE

LOCTITE[®] EA 9509 cures when exposed to appropriate levels of heat. Recommended conditions for curing are exposure of the bond line to temperatures at or above 120 °C, (typically 60 minutes @ 120°C). Rate of cure and final strength will depend on the residence time at the cure temperature so cure schedule should be confirmed with actual production parts and equipment.

Cure Speed vs. Temperature

The following graph shows the shear strength developed with time at different cure temperatures. In practice, total oven time will be longer to allow for heat up period. Shear strength is measured on grit blasted mild steel (GBMS) lapshears with 25.4 mm overlap and 0.05 mm bond gap tested at @ 22°C according to ASTM D1002/EN 1465.



TYPICAL PROPERTIES OF CURED MATERIAL

1.2 mm thick samples cured for 30 minutes @ 150°C

Bulk Modulus, N/mm ²	1,280
ASTM D-882	
Elongation, %	2
ASTM D-882	
Tensile Strength, ASTM D-882, N/mm ²	23
Glass Transition Temperature °C	147
ASTM E 1640-99	
Coefficient of Thermal Expansion ASTM E831-93, K-1:	
Temperature Range: 19 to 99 °C	19×10 ⁻⁶
Temperature Range: 142 to 200 °C	224×10 ⁻⁶
Coefficient of Thermal Conductivity, W/(m·K)	0.37
ASTM C177-63	
Compressive Strength, ASTM D695, N/mm ²	82

TYPICAL PERFORMANCE OF CURED MATERIAL

Cured for 30 minutes @ 150°C, tested at 22 °C. (0.05 mm bond gap).

Lap Shear Strength ASTM D1002/EN 1465:

Steel (grit blasted)	N/mm ²	30
Stainless Steel	N/mm ²	25
Aluminum (abraded)	N/mm ²	19
Aluminum (etched)	N/mm ²	19
Galvanized Steel (HD)	N/mm ²	12
Zinc dichromate	N/mm ²	20
Brass	N/mm ²	20
GRP (Polyester Resin Matrix) (60 min @ 120 °C)	N/mm ²	2.7
Epoxy (Glass Fibre Reinforced) (60 min @ 120 °C)	N/mm ²	9
180° Peel Strength ASTM D1876:		
Mild Steel (grit blasted)	N/mm ²	<1
Impact Resistance, ISO 9653/ASTM D950-98:		
Mild Steel Blocks (grit blasted)	J/m ²	4

Chemical/Solvent Resistance

Immersed in conditions indicated and tested at 22 °C.

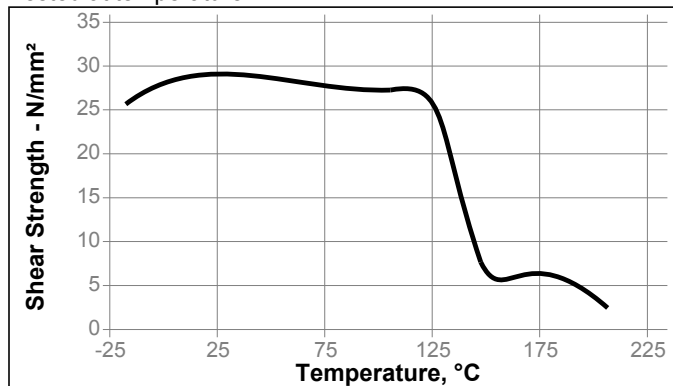
Environment	°C	% of initial strength			
		100 h	500 h	1000 h	3000 h
Motor oil	22	88	87	79	78
Unleaded gasoline	22	94	87	86	82
50 % Water Glycol	87	84	68	64	48
4% Sodium Hydroxide / Water	22	97	84	83	78
98% RH	40	85	103	88	79
Water	60	86	73	62	57
Water	90	91	82	72	71
Acetic Acid, 10%	22	100	85	74	52
Salt water solution 7.5%	22	92	86	86	75

TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 30 minutes @ 150°C (0.05 mm bond gap).
ASTM D1002/EN 1465
Mild steel (grit blasted)

Hot Strength

Tested at temperature

**Heat Aging**

Stored in air at temperatures indicated and tested at 22°C.

Temperature	% Initial strength retained after			
	100 h	500 h	1,000 h	3,000 h
100 °C	86	88	97	90
125 °C	88	82	92	84
150 °C	93	79	102	80
180 °C	84	72	76	56
200 °C	77	54	47	27

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).

Where aqueous washing systems are used to clean the surfaces before bonding, it is important to check for compatibility of the washing solution with the adhesive. In some cases these aqueous washes can affect the cure and performance of the adhesive.

Directions for use

- For best performance surfaces for bonding should be clean, dry and free of grease. For high strength structural bonds, special surface treatments can increase the bond strength and durability.
- Product can be applied directly from the cartridge by dispensing through the nozzle supplied.
- It is recommended that this product is not cured in large quantities as excessive heat build-up and uncontrolled exothermal runaway can occur. Curing smaller quantities will minimize the heat build-up.
- For maximum bond strength apply adhesive evenly to the surface to be bonded. Parts should be assembled immediately after adhesive has been applied.
- Excess uncured adhesive can be wiped away with organic solvent (e.g. Acetone).
- Cure adhesive as recommended in section 'Typical Cure Performance'. Some additional fillet may form due to lowering of product viscosity with temperature.
- Keep the assembled parts from moving during cure. The joint should be allowed to develop full strength before subjecting to any service loads.
- After use and before adhesive hardens, mixing and application equipment should be cleaned with hot soapy water.

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.

Not for product specifications

The technical data contained herein are intended as reference only. Please contact your local quality department for assistance and recommendations on specifications for this product.

Conversions

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 = \text{V/mil}$
 $\text{mm} / 25.4 = \text{inches}$
 $\text{N} \times 0.225 = \text{lb/F}$
 $\text{N/mm} \times 5.71 = \text{lb/in}$
 $\text{psi} \times 145 = \text{N/mm}^2$
 $\text{MPa} = \text{N/mm}^2$
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$
 $\text{mPa}\cdot\text{s} = \text{cP}$

Disclaimer

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Reference 0.0