

LOCTITE[®] EA 9461

Known as Hysol 9461 September 2016

PRODUCT DESCRIPTION

LOCTITE[®] EA 9461 provides the following product characteristics:

Technology	Ероху			
Chemical Type (Resin)	Ероху			
Chemical Type	Amine			
(Hardener)				
Appearance (Resin)	White opaque paste			
Appearance (Hardener)	Black opaque paste			
Appearance (Mixture)	Gray paste			
Components	Two part - Resin & Hardener			
Viscosity	Thixotropic			
Mix Ratio, by volume -	1:1			
Resin : Hardener				
Mix Ratio, by weight -	100 : 100			
Resin : Hardener				
Cure	Room temperature cure after mixing			
Application	Bonding			
Maximum Gap	3.0 mm			
Specific Benefit	 Excellent peel strength 			
	Excellent tensile shear strength			
	 Impact and fatigue resistant 			
	 Non-sag slump resistance 			
	Easy to mix and dispense			

LOCTITE[®] EA 9461 is a thixotropic, two component epoxy adhesive formulated for ease of use as well for a good balance of properties. This adhesive couples high peel strength and excellent shear strength in a smooth, non-sag paste that is easily dispensed. The product has a medium working life with a quick heat cure response if required. The tough nature of this structural adhesive makes it useful for bonding dissimilar substrates including metals, engineering thermoplastics and thermoset laminates such as sheet moulding compound (SMC).

TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin Properties	
Specific Gravity @ 25 °C	1.35
Viscosity, DIN 54453, mPa·s (cP):	
Shear rate 10 s ⁻¹	85,980
Shear rate 50 s ⁻¹	38,570
Thixotropic Index	2.8

Flash Point - See SDS

Hardener Properties

Specific Gravity @ 25 °C	1.31
Viscosity, DIN 54453, mPa·s (cP):	
Shear rate 10 s ⁻¹	59,530
Shear rate 50 s ⁻¹	42,860
Thixotropic Index	2
Flash Point - See SDS	
Mixed Properties	

Pot Life @ 22 °C, minutes:	
100 g mass	40

TYPICAL CURING PERFORMANCE

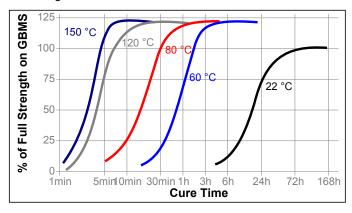
Fixture Time

Fixture time is defined as the time to develop a shear strength of 0.1 N/mm². Fixt

ture Time, mix	ed, @ 22 °C,	minutes	240
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Cure Speed vs. Time/Temperature

LOCTITE[®] EA 9461 will achieve handling strength in 4 to 5 hours at room temperature (note: this can vary with different bond configurations and ambient temperatures). Elevated temperatures may be used to accelerate the cure. The graph below shows the shear strength developed with time on grit blasted steel lap shears at different temperatures and tested according to ISO 4587.



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TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 7 days @ 22 °C, 1.2 mm thick samples

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Physical Properties : Shore Hardness, ISO 868, Durometer D Elongation , ISO 527-2,% Tensile Strength, ISO 527-2	N/mm²	80 3.5 30
Tensile Modulus , ISO 527-2	(psi) N/mm² (psi)	(4,400) 2,757 (400,000)
Electrical Properties: Dielectric Strength, kV/mm		36.6
Dielectric Constant / Dissipation Factor : @ 1 KHz @ 1MHz @ 10MHz		4.1/0.023 3.8/0.04 3.6/0.057

Surface Resistivity, IEC 60093, ohms	≥1.9×10 ¹⁷
Volume Resistivity, IEC 60093, ohm-cm	1.8×10 ¹⁴

TYPICAL PERFORMANCE OF CURED MATERIAL Adhesive Properties

Cured for 7 days @ 22 °C

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Lap Shear Strength , ISO 4587:		
Mild steel (grit blasted)	N/mm ²	25
	(psi)	(3,600)
Aluminum (abraded)	N/mm ²	
(Silicon Carbide Paper, A166 grit, P400A grade)	(psi)	()
Aluminum (etched in acidic ferric sulphate)	N/mm ²	
	(psi)	(3,100)
Stainless steel	N/mm ²	19
Calvanized Steel (Lat Dinned)	(psi) N/mm²	(2,800) 16
Galvanized Steel (Hot Dipped)	(psi)	
Brass	N/mm ²	· · · /
DIASS	(psi)	(1,600)
Zinc dichromate	N/mm ²	· · · /
	(psi)	(2,300)
Polycarbonate	N/mm ²	· · · /
i olyoarbonato	(psi)	(940)
ABS	N/mm ²	6.2
	(psi)	(900)
GRP (Polyester resin matrix)	N/mm²	5
	(psi)	(720)
Glass Fiber Reinforced Epoxy	N/mm ²	13
	(psi)	(1,900)
180° Peel Strength, ISO 8510-2:		4.0
Mild Steel (grit blasted)	N/mm	10
	(lb/in)	(57.1)
IZOD Impact Desistance ISO 0052 1/2		
IZOD Impact Resistance, ISO 9653 J/m ² :		0.0
Mild Steel (grit blasted)		8.3
TYPICAL ENVIRONMENTAL RESISTANC	F	

TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 7 days @ 22 °C Lap Shear Strength , ISO 4587: Mild Steel (grit blasted)

Hot Strength

Tested at temperature

Heat Aging

Aged under conditions indicated and tested at 22 °C.

Temperature	% Initial st	% Initial strength retained after			
	500 h	1,000 h	3,000 h		
50 °C	110	105	105		
80 °C	115	125	120		
100 °C	110	100	100		
120 °C	125	125	125		
150 °C	135	125	120		

Chemical/Solvent Resistance

Immersed in conditions indicated and tested at 22 °C.

		% of initial strength		
Environment	°C	500 h	1000 h	3000 h
Motor oil	22	100	95	100
Unleaded gasoline	22	75	70	60
Water/glycol 50/50	87	75	75	95
Sodium hydroxide, 4%	22	85	80	80
98% RH	40	85	70	70
Water	60	85	75	75
Water	90	85	80	55
Acetone	22	65	35	35
Acetic Acid, 10%	22	75	65	50
Salt water solution, 7.5%	22	80	80	80

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

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- 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.
- 2. To use, resin and hardener must be blended. Product can be applied directly from dual cartridges by dispensing through the mixer head supplied. Discard the first 3 to 5 cm of bead dispensed. Using bulk containers, mix

Asia

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Americas +860.571.5100 thoroughly by weight or volume in the proportions specified in the Product Description Matrix. For hand mixing, weigh or measure out the desired amount of resin and hardener and mix thoroughly. Mix approximately 15 seconds after uniform color is obtained.

- 3. It is recommended that this product is not mixed and cured in bulk quantities of greater than 4 kg as excessive heat build-up can occur. Mixing smaller quantities will minimize the heat build-up.
- 4. Apply the adhesive as guickly as possible after mixing to one surface to be joined. For maximum bond strength apply adhesive evenly to both surfaces. Parts should be assembled immediately after mixed adhesive has been applied.
- 5. For working life please see section 'Typical Properties of Uncured Material'. Higher temperatures and larger quantities will shorten this working time.
- 6. Keep the assembled parts from moving during cure. The joint should be allowed to develop full strength before subjecting to any service loads.
- 7. Excess uncured adhesive can be wiped away with organic solvent (e.g. Acetone).
- 8. After use and before adhesive hardens, mixing and application equipment should be cleaned with hot soapy water.

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.

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 $N \ge 0.225 = Ib$ N/mm x 5.71 = lb/in psi x 145 = N/mm² MPa = N/mm² $N \cdot m \ge 8.851 = Ib \cdot in$ $N \cdot m \ge 0.738 = lb \cdot ft$ $N \cdot mm \ge 0.142 = oz \cdot in$ $mPa \cdot s = cP$ Disclaimer Note:

The information provided in this Technical Data Sheet (TDS)

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