

# LOCTITE® EA E-60NC

LOCTITE® Hysol®  
E-60NC™ July 2024

## PRODUCT DESCRIPTION

LOCTITE® EA E-60NC provides the following product characteristics:

<b>Technology</b>	Epoxy
Chemical Type (Resin)	Epoxy
Chemical Type (Hardener)	Amine
Appearance (Resin)	Black liquid
Appearance (Hardener)	Pale yellow liquid
Appearance (Mixture)	Black
Components	Two components - requires mixing
Viscosity	Low
Mix Ratio, (by volume) Resin : Hardener	1 : 1
Mix Ratio, by weight - Resin : Hardener	100 : 86
<b>Cure</b>	Room temperature cure after mixing
<b>Application</b>	Bonding or Potting

LOCTITE® EA E-60NC is a flowable, industrial grade epoxy potting compound with extended work life. Once mixed, the two-component epoxy cures at room temperature to form a rigid, black encapsulant that is non-corrosive to metallic components on PC boards and electronic assemblies. The fully cured epoxy provides excellent environmental and chemical resistance and acts as an electrical insulator. Designed for bonding, potting and encapsulating electrical components which are sensitive to corrosion It is used in electronic applications for component attachment to boards, housing assemblies and potting.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

### Resin:

Specific Gravity @ 23 °C	1.1
Viscosity, Brookfield - RVT, 25°C, mPa·s (cP):	6,000

### Hardener:

Specific Gravity @ 23 °C	0.95
Viscosity, Brookfield - RVT, 25°C, mPa·s (cP):	13,000

### Mixed:

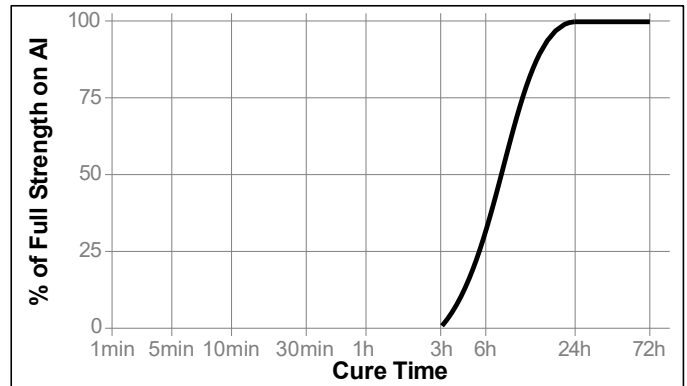
Specific Gravity @ 23 °C	1.0
--------------------------	-----

## TYPICAL CURING PERFORMANCE

Working life, minutes	60
Tack Free Time (low humidity), minutes	120

## Cure speed vs time

The graph below shows shear strength developed with time on abraded, acid etched aluminum lapshears @23°C with an average bondline gap of 0.08 to 0.23 mm and tested according to ISO 4587.



## TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 7 days @ 23°C

### Physical Properties:

Glass Transition Temperature, ASTM E 1640, °C	70
Shore Hardness, ISO 868, Durometer D:	80
Elongation, ISO 527-2, %	9
Tensile Strength, ISO 527-3	N/mm <sup>2</sup> 35 (psi) (5,100)

### Electrical Properties:

Dielectric Breakdown Strength, IEC 60243-1, kV/mm	20
---	----

## Adhesive Properties

Cured for 2 hours @ 65°C

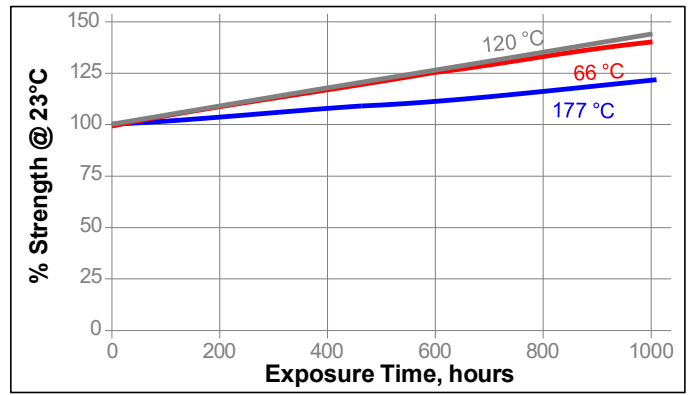
Lap Shear Strength :	
Aluminum (acid etched)	N/mm <sup>2</sup> 30 (psi) (4,400)

Cured for 12 hours @ 65°C

Lap Shear Strength :	
Steel (grit blasted)	N/mm <sup>2</sup> 30 (psi) (4,400)
Aluminum (anodised)	N/mm <sup>2</sup> 18 (psi) (2,600)
Stainless steel	N/mm <sup>2</sup> 27



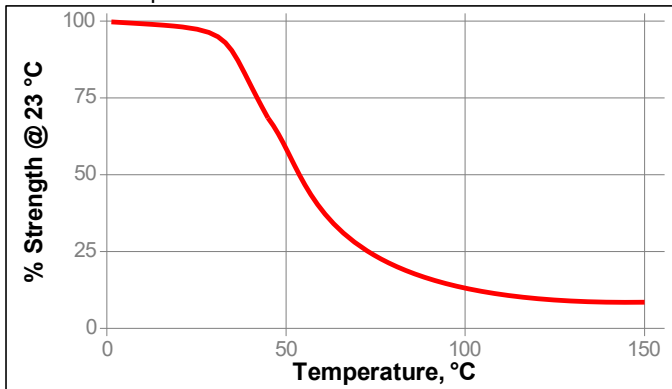
	(psi)	(3,900)
Polycarbonate	N/mm <sup>2</sup>	13
	(psi)	(1,900)
Nylon	N/mm <sup>2</sup>	1.9
	(psi)	(280)
Wood (Fir)	N/mm <sup>2</sup>	11.3
	(psi)	(1,600)
Block Shear Strength, ISO 13445:		
PVC	N/mm <sup>2</sup>	12
	(psi)	(1,700)
ABS	N/mm <sup>2</sup>	13
	(psi)	(1,900)
Epoxy	N/mm <sup>2</sup>	29
	(psi)	(4,200)
Acrylic	N/mm <sup>2</sup>	1
	(psi)	(150)
Glass	N/mm <sup>2</sup>	32
	(psi)	(4,600)



**TYPICAL ENVIRONMENTAL RESISTANCE**

Cured for 12 hours @ 65°C followed by 4 hours @ 23°C  
 Lap Shear Strength :  
 Aluminum (acid etched & abraded), 0.1 to 0.2 mm gap

**Hot Strength**  
 Tested at temperature



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

**Chemical/Solvent Resistance**

Aged under conditions indicated and tested @ 23 °C.

Environment	°C	% of initial strength	
		500 h	1000 h
Air	87	---	120
Motor oil (10W30)	87	140	145
Unleaded gasoline	87	100	125
Water/glycol 50/50	87	100	110
Salt fog	23	---	80
95% RH	38	---	115
Condensing Humidity	49	---	95
Water	23	---	95
Acetone	23	75	95
Isopropanol	23	90	105

**GENERAL INFORMATION**

For safe handling information on this product, consult the Safety Data Sheet (SDS).

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.

**Directions for use**

1. For best performance part surfaces should be clean and free of grease.
2. For high strength structural bonds, remove surface contaminants such as paint, oxide films, oils, dust, mold release agents and all other surface contaminants.
3. Use gloves to minimize skin contact. DO NOT use solvents for cleaning hands.
4. **Dual Cartridges:** To use simply insert the cartridge into the application gun and start the plunger into the cylinders using light pressure on the trigger. Next, remove the cartridge cap and expel a small amount of adhesive to be sure both sides are flowing evenly and freely. If automatic mixing of resin and hardener is desired, attach the mixing nozzle to the end of the cartridge and begin dispensing the adhesive. For hand mixing, expel the desired amount of the adhesive and mix thoroughly. Mix for approximately 15 seconds after uniform color is obtained.  
**Bulk Containers:** Mix thoroughly by weight or volume in the proportions specified in Product Description section. Mix vigorously, approximately 15 seconds after uniform color is obtained.
5. For maximum bond strength apply adhesive evenly to both surfaces to be joined.
6. Application to the substrates should be made within 60 minutes. Larger quantities and/or higher temperatures will reduce this working time.



- Join the adhesive coated surfaces and allow to cure at 25 °C for 24 hours for high strength. Heat up to 93 °C, will speed curing.
- Keep parts from moving during cure. Contact pressure is necessary. Maximum shear strength is obtained with a 1 to 2 mm bond line.
- Excessive uncured adhesive can be cleaned up with ketone type solvents.

### 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 Henkel representative.

### Product Specification

The technical data contained herein are intended as reference only and are not considered specifications for the product. Product specifications are located on the Certificate of Analysis or please contact Henkel representative.

### Approval and Certificate

Please contact Henkel representative for related approval or certificate of this product.

### Data Ranges

The data contained herein may be reported as a typical value. Values are based on actual test data and are verified on a periodic basis.

Temperature/Humidity Ranges: 23 °C / 50% RH = 23±2 °C / 50±5% RH

### Conversions

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

### Disclaimer

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

Any liability in respect of the information in the Technical Data

Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

**In case products are delivered by Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA please additionally note the following:**

In case Henkel would be nevertheless held liable, on whatever legal ground, Henkel's liability will in no event exceed the amount of the concerned delivery.

**In case products are delivered by Henkel Colombiana,**

**S.A.S. the following disclaimer is applicable:**

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. Henkel is not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

**In case products are delivered by Henkel Corporation or Henkel Canada, Inc. the following disclaimer is applicable:**

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

### Trademark usage

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 0.3

