

## **LOCTITE® EA E-60NC**

Known as

**Hysol® Product E-60NC** 

September 2015

#### PRODUCT DESCRIPTION

LOCTITE® EA E-60NC is a flowable, industrial grade epoxy potting compound with extended work life. Once mixed, the two-part 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.

#### TYPICAL APPLICATIONS

Designed for bonding, potting and encapsulating electrical components which are sensitive to corrosion. Used in electronic applications, for component attachment to boards, housing assembly and potting.

#### PROPERTIES OF UNCURED MATERIAL Resin

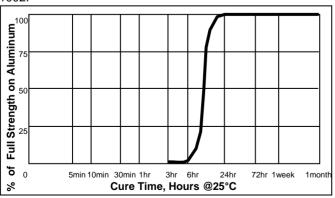
Resin	Typical	
	Value	Range
Chemical Type	Epoxy	
Appearance	Black liquid	
Specific Gravity @ 25°C	1.10	1.0 to 1.2
Viscosity @ 25°C, mPa.s (cP)	6,200	5,200 to 7,200
Flash Point (TCC), °C (°F)	>93 (>200)	

Hardener	i ypicai		
	Value	Range	
Chemical Type	Amine		
Appearance	Pale yellow liquid		
Specific Gravity @ 25°C	1.00	0.9 to 1.1	
Viscosity @ 25°C, mPa.s (cP)	13,000	12,000 to 14,000	
Flash Point (TCC), °C (°F)	>93 (>200)		

Mixture	Typical Value
Appearance	Black Opaque
Specific Gravity @ 25°C	1.05
Mix Ratio (R:H) by Weight	100 to 91
by Volume	1 to 1

#### **TYPICAL CURING PERFORMANCE** Cure speed

The graph below shows the shear strength developed over time on abraded, acid etched aluminum lap shears with an average bondline gap of 3 to 9 mils and tested according to ASTM D-1002.



#### **Curing Properties**

(@ 25°C unless noted)	Typical Value
Working Life, minutes	60
Tack Free time, minutes	180

#### TYPICAL PROPERTIES OF CURED MATERIAL

(@ 25°C unless noted)	
Physical Properties	Typical Value
Dielectric Strength, Volts/Mil	550
Tensile Strength ASTM D638, psi	6,800
Tensile Elongation ASTM D-638, %	8
Hardness ASTM D-1706, Shore D	85
Glass Transition Temperature, Tg, °C	55

#### PERFORMANCE OF CURED MATERIAL

**Shear Strength vs Substrate** 

(Substrates cured for 5 days @ 22°C)		
Substrate	Typical	Value
Lapshear	N/mm <sup>2</sup>	(psi)
Grit-Blasted Steel	18.1	2630
Aluminum (Abraded/Acid Etched, 3 to 9 mil gap)	21.4	3110
Aluminum (Anodized)	7.9	1150
Stainless Steel	7.8	1130
Polycarbonate	5.9	850
Nylon	1.3	190
Wood (Fir)	11.1	1610
Block Shear	N/mm²	(psi)
PVC	4.6	670
ABS	6.5	940

### TYPICAL ENVIRONMENTAL RESISTANCE

**Hot Strength** 

Ероху

Acrylic

Glass

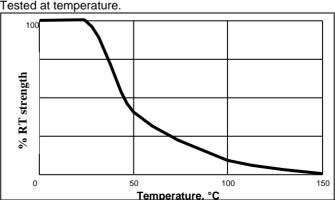
Test procedure : **ASTM D-1002** 

Substrate: Abraded, acid etched aluminum

Bondline gap, mils: 3 to 9

Cure procedure: 12 hours at 65°C & 4 hours at 22°C

Tested at temperature.





14.8

1.2

2140

180

2020



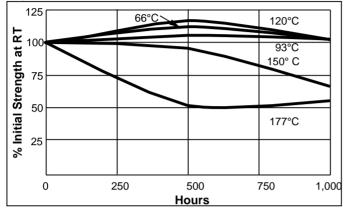
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#### **Heat Aging**

Cured for 5 days at 22°C on steel with no induced gap, aged at temperature indicated and tested at 22°C.



#### **Chemical / Solvent Resistance**

Cured for 5 days at 22°C on steel with no induced gap, aged under conditions indicated and tested at 22°C.

Temp.	% Initial Strer	ngth retained at
	500 hr	1000 hr
87°C	108	110
87°C	104	82
87°C	96	101
87°C	95	101
22°C	59	85
38°C	102	100
49°C	78	81
22°C	89	94
22°C	78	64
22°C	98	90
	87°C 87°C 87°C 87°C 22°C 38°C 49°C 22°C 22°C	500 hr 87°C 108 87°C 104 87°C 96 87°C 95 22°C 59 38°C 102 49°C 78 22°C 89 22°C 78

#### **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**

- For high strength structural bonds, removal of surface contaminates such as paint, oxide films, oils, dust, mold release agents and all other surface contaminates.
- Use gloves to minimize skin contact. DO NOT use solvents for cleaning hands.
- 3. 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 approximately 15 seconds after uniform color is obtained. **Bulk Containers:** Mix thoroughly by weight or volume in the proportions specified in Properties of Uncured Material section. Mix vigorously approximately 15 seconds after uniform color is obtained.

- 4. For maximum bond strength apply adhesive evenly to both surfaces to be joined.
- 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 (77°F) for 24 hours for high strength. Heat up to 93°C (200°F), will speed curing.
- Keep parts from moving during cure. Contact pressure is necessary. Maximum shear strength is obtained with a 3-9 mil bond line.
- 8. Excess uncured adhesive can be cleaned up with ketone type solvents.

#### Storage

Product shall be ideally stored in a cool, dry location in unopened containers at a temperature between 8°C to 28°C (46°F to 82°F) unless otherwise labeled. Optimal storage is at the lower half of this temperature range. To prevent contamination of unused product, do not return any material to its original container. For further specific shelf life information, contact your local Technical Service Center.

#### **Data Ranges**

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

#### Note

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# Product Description Sheet LOCTITE® EA E-60NC

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