



PRODUCT DESCRIPTION

LOCTITE® E-04 is two-component toughened epoxy designed for structural metal, magnet, glass and plastics bonding. Once mixed, the two-component epoxy cures at room temperature.

FEATURES

- Thixotropic
- Low Shrinkage
- Excellent Impact Resistance
- Outstanding insulation properties
- Good Chemical Resistance

PROPERTIES OF UNCURED MATERIAL

Resin

	Typical Value
Chemical Type	Epoxy
Appearance	White
Viscosity @ 25°C, cP	80,000
Specific Gravity, 25°C	1.32
Flash Point (TCC), °C (°F)	>94 (>201)

Hardener

	Typical Value
Chemical Type	Epoxy
Appearance	Black
Viscosity @ 25°C, cP	75,000
Specific Gravity, 25°C	1.37
Flash Point (TCC), °C (°F)	>94 (>201)

Mixture

	Typical Value
Appearance	Gray
Viscosity @ 25°C, cP	77,500
Specific Gravity, 25°C	1.34
Mix Ratio (R:H) by Weight	1:1
By Volume	1:1
Maximum gap fill mm (in)	5.0 (0.2)

CURING PROPERTIES

Cure rate of E-04 @ room temperature, 25°C (77°F)

Work Life*, minutes	45
Handling Time, hours	2
Full Cure, hours	24

*The work life refers to the pot life of the epoxy after mixing

Cure Temperature °C, °F	Handling Time	Full Cure
25 (77)	2 hours	24 hours
45 (113)	30 minutes	6 hours
65 (149)	8 minutes	1.5 hours
100 (212)	2 minutes	45 minutes

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties

Description of curing parameters	Property	Typical Value
	Hardness (Shore D) at 25°C	60

LAP SHEAR STRENGTH (ASTM D1002)

Material	Typical Value psi (N/mm ²)
Steel / Steel	2500 - 3000 (17 - 21)
Aluminum / Aluminum	2000 - 2500 (17 - 19)
Galvanized Steel / Galvanized Steel	2000 - 2500 (14 - 17)
Stainless Steel / Stainless Steel	2800 - 3300 (17 - 23)
Ferrite / Steel	Substrate Failure, 2000 (14)
Ferrite / Zinc Dichromate	Substrate Failure, 2000 (14)
Ferrite / Galvanized Steel	Substrate Failure, 2000 (14)
Ferrite / Zinc Plated	Substrate Failure, 2000 (14)
Glass / Glass	Substrate Failure, 250 (1.7)
Phenolic / Phenolic	250 (1.7)
PVC / PVC	400 (2.8)
Polycarbonate / Polycarbonate	500 (3.4)
ABS / ABS	700 (4.8)
Acrylic / Acrylic	150 (1.0)

PEEL STRENGTH (ASTM 1876)

Material	Typical Value
Steel / Steel (0.008 in. gap)	10 - 15 lb/ linear inch

IMPACT STRENGTH (ASTM 950)

Material	Typical Value
Steel / Steel (0.008 in. gap)	12 - 15 ft-lb / in ²

THERMAL PROPERTIES

Property	Typical Value
Operating Temperature, °C (°F)	-55 to 70 (-67 to 158)
Thermal Expansion Coefficient, m/m/°C	20 to 65 x 10 ⁻⁶
Thermal Conductivity, W/m°C	0.2 - 2.0

ELECTRICAL PROPERTIES

Property	Typical Value
Dielectric Strength, volts/mil (KV/cm)	300-450 (120 -180)
Dielectric Constant	3.5 - 6.0
Dissipation Factor	0.002 - 0.02
Volume Resistivity, ohm-cm	>1 x 10 ¹⁴



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CHEMICAL RESISTANCE

Chemical	Effect on Cured Adhesive	
	After 1 week exposure	After 1 month exposure
Water	None	None
50% Water / 50% Antifreeze	Slight Attack	Slight Attack
Motor Oil	Slight Attack	Slight Attack
Transmission Fluid	None	None
Gasoline	Slight Attack	Moderate Attack
Freon	No Attack	No Attack
0.1 N HCL	Slight Attack	Moderate Attack
Heptane	No Attack	Slight Attack
0.0001 N NaOH	Slight Attack	Moderate Attack
MEK	Severe Attack	Severe Attack
20% H ₃ PO ₄	Severe Attack	Severe Attack
Toluene	Severe Attack	Severe Attack
Acetone	Severe Attack	Severe Attack

LAP SHEAR STRENGTH (ASTM D1002) CHEMICAL RESISTANCE

Chemical	Exposure Time & Temperature	Percent Shear Strength Retained
Motor Oil	90 hr @ 25°C (77°F)	96
AFT Oil	90 hr @ 25°C (77°F)	94
50% Water / 50% Antifreeze	90 hr @ 25°C (77°F)	88
Freon	90 hr @ 25°C (77°F)	80

ENVIRONMENTAL DURABILITY

Substrates	Environmental Exposure	Percent Shear Strength Retained	
		1 week	1 month
Steel / Steel	38°C (100°F), 5% Salt Spray	81	86

USE AND APPLICATION

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).

Storage

Store product in cool, dry location, in unopened containers at a temperature between 8°C and 27°C (26°F to 80°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 Application Engineering at (860) 571-5100.

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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