

PRODUCT DESCRIPTION

LOCTITE® EA E-20HP provides the following product characteristics:

Technology	Epoxy
Chemical Type	Epoxy
Appearance (resin)	Pale yellow liquid
Appearance (hardener)	Yellow liquid
Appearance (mixed)	Off-white
Components	Two components - Requires mixing
Viscosity	Medium
Mix Ratio, (by volume) Resin : Hardener	2 : 1
Mix Ratio, (by weight) Resin : Hardener	100 : 55
Cure	Room temperature cure after mixing
Application	Bonding

LOCTITE® EA E-20HP is a toughened, medium viscosity, industrial grade epoxy adhesive with a medium working life. Once mixed, the two component epoxy cures at room temperature to form a tough, off-white bondline which provides high peel resistance and high shear strengths. The fully cured epoxy is resistant to a wide range of chemicals and solvents, and acts as an excellent electrical insulator. Typical applications include general purpose industrial applications requiring moderate work life with high performance on a wide variety of plastics, metals, dry concrete or architectural materials.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin:

Specific Gravity @ 23 °C	1.0
Viscosity, Brookfield - RVT @ 25 °C, mPa·s (cP): Spindle 7, Speed 20 rpm	65,000

Hardener:

Specific Gravity @ 23 °C	1.1
Viscosity, Brookfield - RVT @ 25 °C, mPa·s (cP): Spindle 6, Speed 50 rpm	7,000

Mixed:

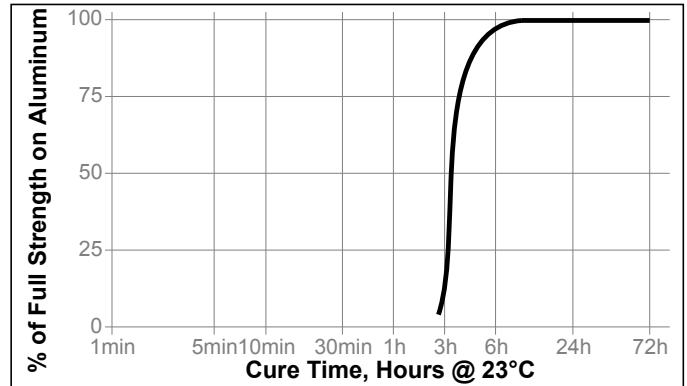
Specific Gravity @ 23 °C	1.03
Viscosity, Brookfield - RVT @ 25 °C, mPa·s (cP): Spindle 7, Speed 20 rpm	65,000

TYPICAL CURING PERFORMANCE

Working life, @ 23 °C, minutes	20
Tack Free Time, minutes	40

Cure Speed vs. Time

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 (0.1 to 0.2 mm) and tested according to ASTM D-1002.



TYPICAL PERFORMANCE OF CURED MATERIAL

Cured for 5 days @ 23 °C

Physical Properties

Glass Transition Temperature (Tg), °C TMA, ISO 11359-2	60
Shore Hardness, ISO 868 , Durometer D	80
Elongation, at break, ISO 527-3, %	8
Tensile Strength, ISO 527-2	N/mm ² 39 (psi) (5,700)

Electrical Properties

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

Lap Shear Strength ISO 4587:	
Mild Steel (Grit Blasted)	N/mm ² 22.6 (psi) (3,270)
Aluminum (Acid Etched & Abraded)	N/mm ² 28.2 (psi) (4,090)
Aluminum (Anodized)	N/mm ² 17.4 (psi) (2,530)
Stainless Steel	N/mm ² 22.0 (psi) (3,190)
Polycarbonate	N/mm ² 3.9 (psi) (560)
Nylon	N/mm ² 1.8 (psi) (260)
Wood (Fir)	N/mm ² 11.4 (psi) (1,660)

Block Shear Strength, ISO 13445:

PVC	N/mm ²	7.9
	(psi)	(1,140)
ABS	N/mm ²	10.4
	(psi)	(1,510)
Epoxy	N/mm ²	28.6
	(psi)	(4,140)
Acrylic	N/mm ²	2.0
	(psi)	(290)
Glass	N/mm ²	32.3
	(psi)	(4,690)

Concrete Strength by ASTM C881/C882-99

LOCTITE® EA E-20HP passes the requirements of a type IV epoxy. During testing the concrete fractured prior to the adhesive failing. The test was modified as we do not recommend it be used on wet surfaces.

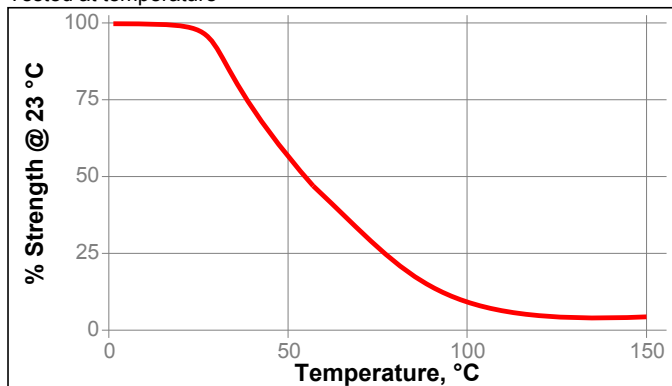
TYPICAL ENVIRONMENTAL RESISTANCE

Lap Shear Strength, ISO 4587:

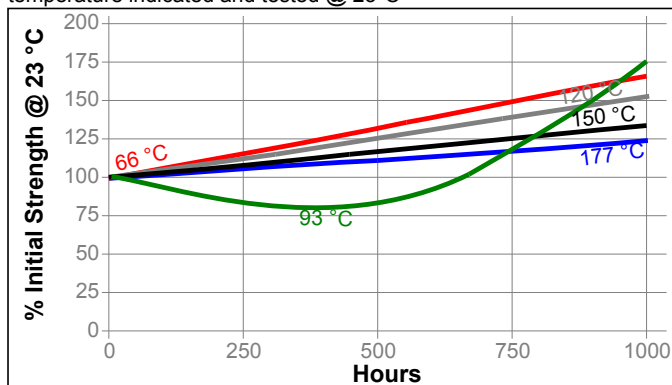
Hot Strength

Cured for 12 hours @ 65°C and 4 hours @ 23°C with 3 to 9 mils (0.1 to 0.2 mm) bondline gap on Aluminum (Acid Etched & Abraded)

Tested at temperature

**Heat Aging**

Cured for 5 days @ 23°C on steel with no induced gap, aged at temperature indicated and tested @ 23°C

**Chemical/Solvent Resistance**

Cured for 5 days @ 23°C on steel with no induced gap, aged at temperature indicated and tested @ 23°C

Environment	°C	% of initial strength	
		500 h	1000 h
Air	87	---	137
Motor oil (10W30)	87	164	171
Unleaded gasoline	87	108	82
Water/glycol 50/50	87	121	125
Salt/Fog ASTM B-117	23	---	73
95% RH	38	---	100
Condensing Humidity	49	---	90
Water	23	---	81
Acetone	23	76	95
Isopropanol	23	87	125

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).

Directions for use

- For high strength structural bonds, remove surface contaminants such as paint, oxide films, oils, dust, mold release agents and all other surface contaminants.
- Use gloves to minimize skin contact. DO NOT use solvents for cleaning hands.
- For maximum bond strength apply adhesive evenly to both surfaces to be joined.
- Dual Cartridges:** To begin using a new cartridge, remove cartridge cap and dispense a small amount of adhesive, making sure both parts A&B are extruding. Attach nozzle and dispense approximately mm, before applying onto part to be bonded. Partially used cartridges can be stored with the mixing nozzle attached. To reuse, remove and discard old nozzle, attach the new nozzle, dispense approximately mm, before applying onto part to be bonded.
- Bulk Containers:** Normally material is dispensed through volumetric metered mixing equipment, attached to static mix nozzles.
- Application to the substrates should be made within 20 minutes. Larger quantities and/or higher temperatures will reduce this working time.
- Join the adhesive coated surfaces and allow to cure. Higher temperatures will speed up curing.
- Keep assembled parts from moving during cure. The bond should be allowed to develop full strength before subjecting to any service load.
- 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 a 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

(°C x 1.8) + 32 = °F
 kV/mm x 25.4 = V/mil
 mm / 25.4 = inches
 µm / 25.4 = mil
 N x 0.225 = lb
 N/mm x 5.71 = lb/in
 N/mm² x 145 = psi
 MPa x 145 = psi
 N·m x 8.851 = lb·in
 N·m x 0.738 = lb·ft
 N·mm x 0.142 = oz·in
 mPa·s = 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.

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Reference 1

