Technical Data Sheet

LOCTITE® EA E-20HP

Known as
Hysol® E-20hp
September 2015

PRODUCT DESCRIPTION

LOCTITE® E-20HP is a toughened, medium-viscosity, industrial grade epoxy adhesive with a medium work life. Once mixed, the two-component epoxy cures at room temperature to form a tough, off-white, bondline that 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

The high performance epoxy provides excellent bond strengths to a wide variety of plastics and metals. Ideal for general purpose industrial assemblies. Used as adhesive for bonding dry concrete or limestone for architectural applications.

PROPERTIES OF UNCURED MATERIAL

Resin	**Typical Value**	**Range**
Chemical Type	Epoxy	
Appearance	Pale yellow liquid	
Specific Gravity @ 25°C	1.00	0.9 to 1.1
Viscosity @ 25°C, mPa.s (cP)	65,000	40,000 to 90,000
Flash Point (TCC), °C (°F)	>93 (>200)	

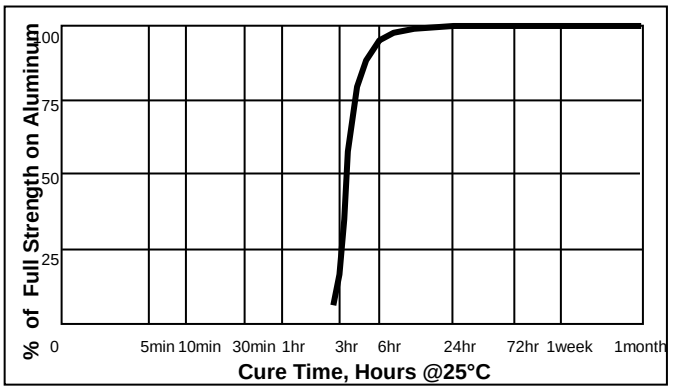
Hardener	**Typical Value**	**Range**
Chemical Type	Amine	
Appearance	Yellow liquid	
Specific Gravity @ 25°C	1.10	1.0 to 1.2
Viscosity @ 25°C, mPa.s (cP)	7,000	5,500 to 8,000
Flash Point (TCC), °C (°F)	>93 (>200)	

Mixture	**Typical Value**
Appearance	Off-white
Specific Gravity @ 25°C	1.03
Mix Ratio (R:H) by Weight	100 to 55
by Volume	2 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 bond line gap of 3 to 9 mils and tested according to ASTM D-1002.



Curing Properties

(@ 25°C unless noted)	**Typical Value**
Working Life, minutes	20
Tack Free time, minutes	40

TYPICAL PROPERTIES OF CURED MATERIAL

(@ 25°C unless noted)

Physical Properties	**Typical Value**
Dielectric Strength, Volts/Mil	500
Tensile Strength ASTM D638, psi	5,700
Tensile Elongation ASTM D-638, %	8
Hardness ASTM D-1706, Shore D	80
Glass Transition Temperature, Tg, °C	60

PERFORMANCE OF CURED MATERIAL

Shear Strength vs Substrate

(Substrates cured for 5 days @ 22°C)

Substrate	**Typical Value**	
Lapshear	**N/mm²**	**(psi)**
Grit-Blasted Steel	22.6	3270
Aluminum (Abraded/Acid Etched, 3 to 9 mil gap)	28.2	4090
Aluminum (Anodized)	17.4	2530
Stainless Steel	22.0	3190
Polycarbonate	3.9	560
Nylon	1.8	260
Wood (Fir)	11.4	1660

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Block Shear	N/mm²	(psi)
PVC	7.9	1140
ABS	10.4	1510
Epoxy	28.6	4140
Acrylic	2.0	290
Glass	32.3	4690

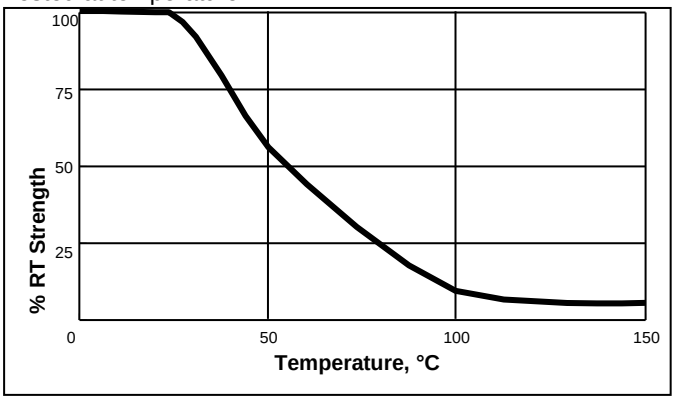
Concrete Strength by ASTM C881/C882-99
E-20 HP passes the requirements of a type IV epoxy. During testing the concrete fractured prior to the adhesive failing. The test was modified as we do not recommend it be used on wet surfaces.

TYPICAL ENVIRONMENTAL RESISTANCE

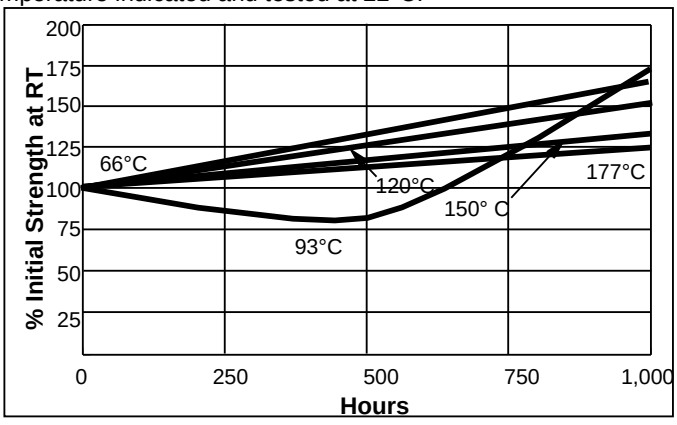
Hot Strength

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.



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.

Solvent	Temp	% Initial Strength retained at 500 hr	1000 hr
Air	87°C	-	137
Motor Oil (10W-30)	87°C	164	171
Unleaded Gasoline	87°C	108	82
Water/Glycol (50%/50%)	87°C	121	125
Salt/Fog ASTM B-117	22°C	-	73
95% Relative Humidity	38°C	-	100
Condensing Humidity	49°C	-	90
Water	22°C	-	81
Acetone	22°C	76	95
Isopropyl Alcohol	22°C	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 Material Safety Data Sheet, (MSDS).

Directions for use

1. For high strength structural bonds, removal of surface contaminates such as paint, oxide films, oils, dust, mold release agents and all other surface contaminates.
2. 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.
5. Application to the substrates should be made within 20 minutes. Larger quantities and/or higher temperatures will reduce this working time.
6. 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.

7. 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
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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