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Product Description Sheet

LOCTITE® EA E-05CL

Known as
Hysol® Product E-05CL
November 2014

PRODUCT DESCRIPTION

LOCTITE® EA E-05CL is a fast-setting, toughened, medium-viscosity, industrial grade epoxy adhesive. Once mixed, the two-component epoxy cures at room temperature with low shrinkage and forms an ultra-clear bond line with excellent peel resistance. When fully cured, the epoxy is resistant to a wide range of chemicals and solvents, and acts as an excellent electrical insulator.

TYPICAL APPLICATIONS

Ideal for bonding plastic, metal, glass, wood, ceramic, rubber, and masonry materials where flexibility is needed. Designed for a variety of applications such as flex circuits, cable boots, and staking fillet bonds. Well suited for applications that require an ultra-clear bond line.

PROPERTIES OF UNCURED MATERIAL

Resin	Typical Value	Range
Chemical Type	Epoxy	
Appearance	Clear/yellow liquid	
Specific Gravity @ 25°C	1.10	1.0 to 1.2
Viscosity @ 25°C, mPa.s (cP)	1,900	1550 to 2250
Flash Point (TCC), °C (°F)	>93 (>200)	

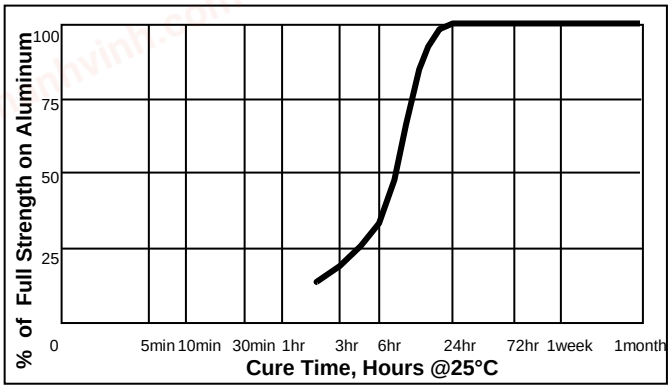
Hardener	Typical Value	Range
Chemical Type	Mercaptan	
Appearance	Light colored liquid	
Specific Gravity @ 25°C	1.15	1.0 to 1.2
Viscosity @ 25°C, mPa.s (cP)	2,800	2,000 to 4,000
Flash Point (TCC), °C (°F)	>93 (>200)	

Mixture	Typical Value
Appearance	Ultra Clear
Specific Gravity @ 25°C	1.13
Mix Ratio (R:H) by Weight	100 to 105
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	3
Tack Free time, minutes	3.5

TYPICAL PROPERTIES OF CURED MATERIAL

(@ 25°C unless noted)

Physical Properties	Typical Value
Dielectric Strength, Volts/Mil	400
Tensile Strength ASTM D638, psi	270
Tensile Elongation ASTM D-638, %	80
Hardness ASTM D-1706, Shore D	55
Glass Transition Temperature, Tg, °C	10

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	9.9	1430
Aluminum (Abraded/Acid Etched, 3 to 9 mil gap)	2.5	1140
Aluminum (Anodized)	5.2	750
Stainless Steel	4.8	700
Polycarbonate	2.1	300
Nylon	0.3	40
Wood (Fir)	2.6	380
Block Shear	**N/mm²**	**(psi)**
PVC	12.8	1850
ABS	1.7	240
Epoxy	3.0	440
Acrylic	0.6	90
Glass	24.3	3530

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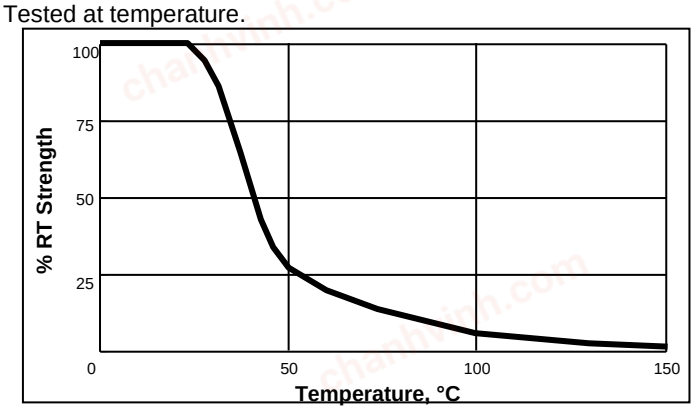
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TYPICAL ENVIRONMENTAL RESISTANCE

Hot Strength

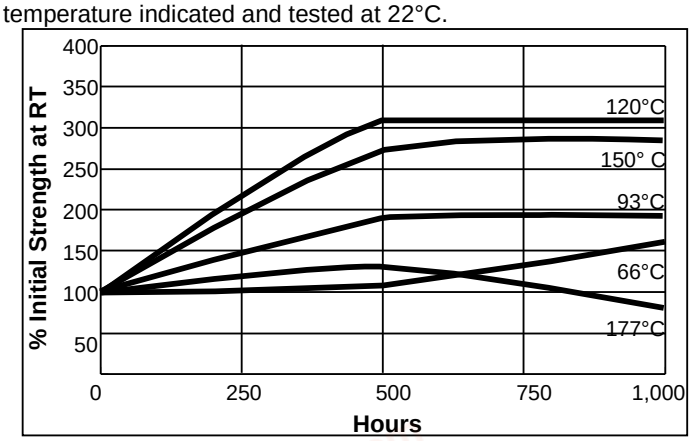
Test procedure :	ASTM D-1002
Substrate:	Abraded, acid etched aluminum
Bondline gap, mils:	5 to 9
Cure procedure:	12 hours at 65°C & 4 hours at 22°C

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	153	126
Motor Oil (10W-30)	87°C	73	104
Unleaded Gasoline	87°C	87	72
Water/Glycol (50%/50%)	87°C	70	52
Salt/Fog ASTM B-117	22°C	7	0
95% Relative Humidity	38°C	16	12
Condensing Humidity	49°C	11	8
Water	22°C	48	59
Acetone	22°C	47	0
Isopropyl Alcohol	22°C	58	35

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 3 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.

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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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