



Hysol[®] E-00CL[™]

June 2006

PRODUCT DESCRIPTION

Hysol[®] E-00CL[™] provides the following product characteristics:

Technology	Epoxy
Chemical Type (Resin)	Epoxy
Chemical Type (Hardener)	Mercaptan
Appearance (Resin)	Clear, colorless to slight yellowish liquid ^{LMS}
Appearance (Hardener)	Clear, colorless to slight yellowish liquid ^{LMS}
Appearance (Mixed)	Clear
Components	Two component - requires mixing
Viscosity	Low
Mix Ratio, by volume - Resin : Hardener	1 : 1
Mix Ratio, by weight - Resin : Hardener	100 : 100
Cure	Room temperature cure after mixing
Application	Bonding

Hysol[®] E-00CL[™] is a fast setting, flowable, industrial grade epoxy adhesive. Once mixed, the two component epoxy cures at room temperature to form a clear, rigid, machineable bondline. When fully cured, the epoxy is resistant to a wide range of chemicals and solvents, and acts as an excellent electrical insulator. Typical applications include general purpose bonding, potting, or encapsulating. Works on a variety of plastic, metal, glass, rubber, wood, and ceramic substrates. Well suited for applications that require a clear bondline.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin:

Specific Gravity @ 25 °C	1.1
Flash Point - See MSDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 6, speed 20 rpm	7,000 to 13,000 ^{LMS}

Hardener:

Specific Gravity @ 25 °C	1.1
Flash Point - See MSDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 6, speed 20 rpm	2,200 to 4,500 ^{LMS}

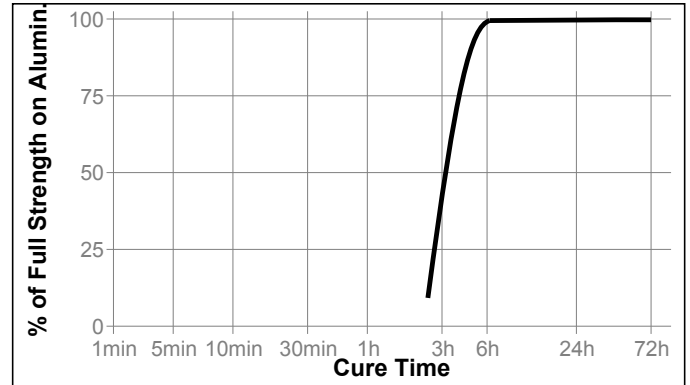
Mixed:

Specific Gravity @ 25 °C	1.1
Working life, minutes	3.5
Tack Free Time, minutes	4

TYPICAL CURING PERFORMANCE

Cure Speed vs. Time

The graph below shows shear strength developed with time on abraded, acid etched aluminum lapshears @ 25 °C with an average bondline gap of 0.1 to 0.2 mm and tested according to ISO 4587.



TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 25 °C

Physical Properties:

Glass Transition Temperature (T _g), °C	20
Shore Hardness, ISO 868, Durometer D	80
Elongation, ISO 527-2, %	13
Tensile Strength, ISO 527-2	N/mm ² 26
	(psi) (3,800)

Electrical Properties:

Dielectric Breakdown Strength, IEC 60243-1, kV/mm 16

Cured for 2 hours @ 65 °C

Physical Properties:

Shore Hardness, ISO 868, Durometer D 75 to 88^{LMS}

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 2 hours @ 65 °C

Lap Shear Strength, ISO 4587:

Aluminum (acid etched)	N/mm ² ≥6.9 ^{LMS}
	(psi) (≥1,000)

Cured for 5 days @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)	N/mm ² 15
	(psi) (2,200)
Aluminum (acid etched & abraded), 0.1 to 0.2 mm gap	N/mm ² 28
	(psi) (4,100)
Aluminum (anodised)	N/mm ² 14
	(psi) (2,100)
Stainless steel	N/mm ² 13
	(psi) (1,900)
Polycarbonate	N/mm ² 6.9
	(psi) (1,000)

Nylon	N/mm ² 1.2 (psi) (170)
Wood (Fir)	N/mm ² 12 (psi) (1,700)
Block Shear Strength, ISO 13445:	
PVC	N/mm ² 17 (psi) (2,500)
ABS	N/mm ² 4.8 (psi) (700)
Epoxy	N/mm ² 10 (psi) (1,400)
Acrylic	N/mm ² 1.7 (psi) (240)
Glass	N/mm ² 15 (psi) (2,200)

TYPICAL ENVIRONMENTAL RESISTANCE

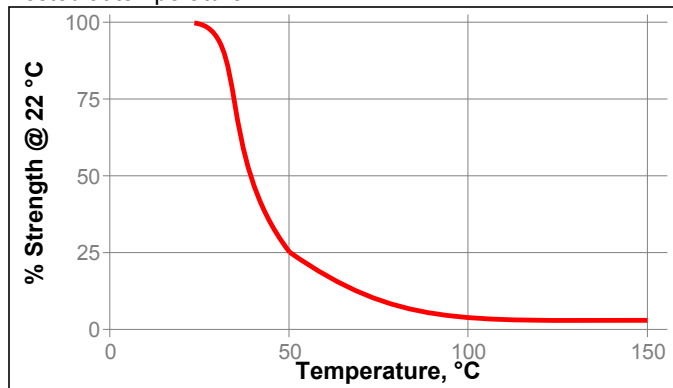
Cured for 12 hours @ 65 °C followed by 4 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Aluminum (acid etched & abraded), 0.1 to 0.2 mm gap

Hot Strength

Tested at temperature



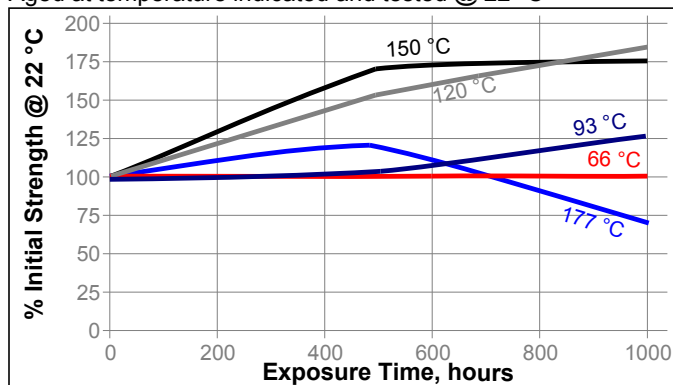
Cured for 5 days @ 22 °C

Lap Shear Strength, ISO 4587:

Steel

Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

Environment	°C	% of initial strength	
		500 h	1000 h
Air	87	95	85
Motor oil (10W-30)	87	95	95
Unleaded gasoline	22	105	105
Water/glycol 50/50	87	70	25
Salt fog	22	35	25
95% RH	38	35	20
Condensing Humidity	49	10	5
Water	22	55	35
Acetone	22	85	100
IPA	22	95	85

GENERAL INFORMATION

For safe handling information on this product, consult the Material Safety Data Sheet (MSDS).

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.

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.
- 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 for approximately 15 seconds after uniform color is obtained.
Bulk Containers: Mix thoroughly by weight or volume in the proportions specified in Product Description section. Mix vigorously, approximately 15 seconds after uniform color is obtained.
- For maximum bond strength apply adhesive evenly to both surfaces to be joined.
- Application to the substrates should be made within 3 minutes. Larger quantities and/or higher temperatures will reduce this working time.
- Join the adhesive coated surfaces and allow to cure at 25 °C for 24 hours for high strength. Heat up to 93 °C, will speed curing.
- Keep parts from moving during cure. Contact pressure is necessary. Maximum shear strength is obtained with a 0.1 to 0.2 mm bond line.
- Excessive uncured adhesive can be cleaned up with ketone type solvents.

Loctite Material Specification^{LMS}

LMS dated July 19, 2001 (Resin) and LMS dated July 19, 2001 (Hardener). Test reports for each batch are available for the indicated properties. LMS test reports include selected QC test parameters considered appropriate to specifications for customer use. Additionally, comprehensive controls are in place to assure product quality and consistency. Special customer specification requirements may be coordinated through Henkel Loctite Quality.

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 Technical Service Center or Customer Service Representative.

Conversions

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 = \text{V/mil}$
 $\text{mm} / 25.4 = \text{inches}$
 $\mu\text{m} / 25.4 = \text{mil}$
 $\text{N} \times 0.225 = \text{lb}$
 $\text{N/mm} \times 5.71 = \text{lb/in}$
 $\text{N/mm}^2 \times 145 = \text{psi}$
 $\text{MPa} \times 145 = \text{psi}$
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$
 $\text{mPa}\cdot\text{s} = \text{cP}$

Note

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Reference 1.0