LOCTITE®

Hysol® E-40EXP™

March 2012

PRODUCT DESCRIPTION

Hysol® E-40EXP™ provides the following product characteristics:

Technology	Epoxy
Chemical Type (Resin)	Epoxy
Chemical Type (Hardener)	Amine
Appearance (Resin)	White liquid
Appearance (Hardener)	Black liquid
Appearance (Mixture)	Black Solid[LMS]
Components	Two component - requires mixing
Mix Ratio, by volume - Resin : Hardener	2 : 1
Mix Ratio, by weight - Resin : Hardener	100 : 45.9
Cure	Room temperature cure after mixing
Application	Potting

Hysol® E-40EXP™ is a two component, self-leveling epoxy designed for potting electric motors. Once mixed, the two component epoxy cures at room temperature. It can be potted into horizontal volumes and will flow to fill the voids. Typical applications include the potting of wire conduits to isolate the electrical motor from the surrounding environment.

UL Classification

Classified by Underwriters Laboratories Inc.® TVLE2.E332773 - This adhesive system has been tested in accordance with UL 1203, "Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations". Hysol® E-40EXP™ has been tested to be suitable for use in Class 1, Groups A, B, C, D; Class II, Groups E, F, and G used in cable sealing fittings or lead seals and may be considered acceptable under the conditions listed below:

Six specimens each were exposed for 168 hours (7 days) to saturated vapors in air of the following chemicals: Acetone, Ammonium Hydroxide (20% by weight), ASTM reference fuel, Diethyl Ether, Ethyl Acetate, Ethylene Dichloride, Furfural, n-Hexane, Methyl Ethyl Ketone, 2-Nitropropane and Toluene. Additional testing will be required in the end product if used with Acetic Acid or Methanol.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin:

Specific Gravity @ 25 °C	1.2
Flash Point - See MSDS	
Viscosity, BrookfieldDV-II, 25 °C, mPa·s (cP):	
Spindle 14, speed 10 rpm	20,800

Hardener:

Specific Gravity @ 25 °C	1.1
Flash Point - See MSDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 14, speed 10 rpm	6,400

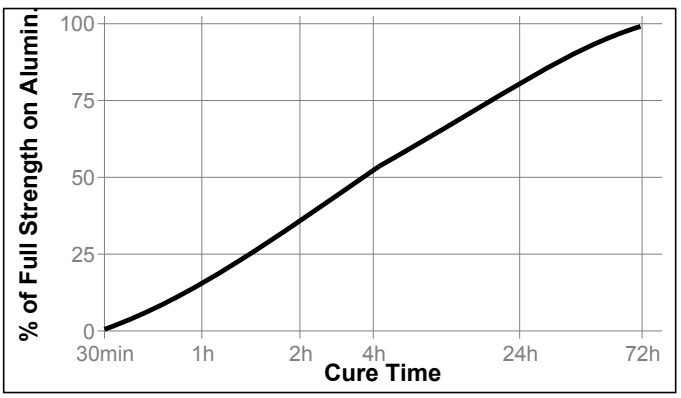
Mixed:

Specific Gravity @ 25 °C	1.2
Tack Free Time , minutes	≤75

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.



Gel Time

Gel time, 22 °C, minutes	<45

Peak Exotherm Temperature

Peak Exotherm Temperature, 50 gram mass:

Peak Temperature Time, minutes	34
Peak Temperature, °C	162

Henkel

TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 25 °C for 7 days

Physical Properties:

Shore Hardness, ISO 868, Durometer D		>80[LMS]
Glass Transition Temperature, ASTM E 1640, °C		52
Coefficient of Thermal Expansion, ISO 11359-1 K^{-1}:		
Pre Tg		26×10^{-6}
Post Tg		151×10^{-06}
Tensile Strength, ISO 527-2	N/mm² (psi)	66 (9,600)
Tensile Modulus, ISO 527-2	N/mm² (psi)	2,750 (399,000)
Elongation, ISO 527-2, %		4
Coefficient of Thermal Conductivity ASTM E 1530, W/(m·K)		0.25
Linear Shrinkage, ISO 1675 %		0.9
Volume Shrinkage, ISO 1675 %		2.7
Water Absorption, ISO 62, %:		
24 hours in water @ 23 °C:		
Increased weight		0.23

Electrical Properties:

Dielectric Breakdown Strength, IEC 60243-1, kV/mm	38
Dielectric Constant / Dissipation Factor, IEC 60250:	
@ 1 KHz	2.9/0.025
@ 10 KHz	3.4/0.0125
@ 100 KHz	3.4/0.018
@ 1MHz	3.3/0.024

Cured @ 65 °C for 2 hours

Lap Shear Strength, ISO 4587	N/mm² (psi)	>17[LMS] (2,470)

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 7 days @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted), , 0.13 mm gap	N/mm² (psi)	14 (2,060)
Aluminum, 0.13 mm gap	N/mm² (psi)	1.4 (200)
Aluminum (anodised), , 0.13 mm gap	N/mm² (psi)	8.3 (1,200)
Stainless steel, 0.13 mm gap	N/mm² (psi)	3.2 (460)
Polycarbonate 0.13 mm gap	N/mm² (psi)	2.8 (400)
Wood (Fir) 0.13 mm gap	N/mm² (psi)	8.3 (1,200)

Block Shear Strength, ISO 13445:

PVC	N/mm² (psi)	3.6 (530)
ABS	N/mm² (psi)	10.7 (1,550)
Nylon	N/mm² (psi)	1.6 (240)
Acrylic	N/mm² (psi)	2.2 (320)
Glass	N/mm² (psi)	3.0 (430)

Cured for 2 hours @ 65 °C

Lap Shear Strength, ISO 4587:

Aluminum (acid etched) 0.13 mm gap	N/mm² (psi)	20.7 (3,000)

TYPICAL ENVIRONMENTAL RESISTANCE

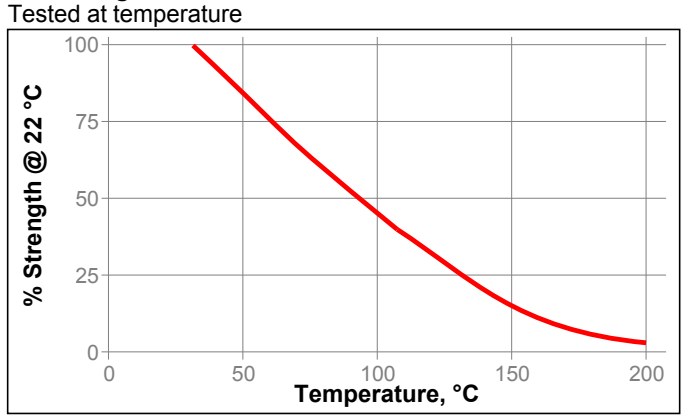
Cured for 7 days @ 22 °C

Lap Shear Strength, ISO 4587:

Grit Blasted Mild Steel (GBMS) 0.13 mm gap

Hot Strength

Tested at temperature



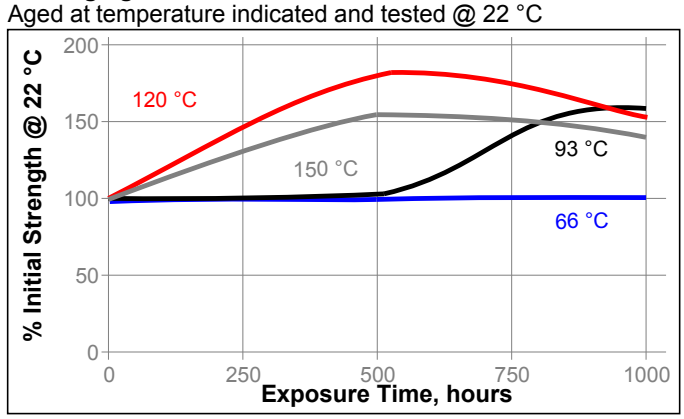
Cured for 5 days @ 22 °C

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.

		% of initial strength	
Environment	**°C**	**500 h**	**1000 h**
Air	87	90	90
Salt fog	36	65	65
95% RH	38	75	75
Condensing Humidity	49	70	80
Water	22	85	100

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. Use gloves to minimize skin contact. DO NOT use solvents for cleaning hands.
2. **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. **Bulk Containers:** Utilize volumetric dispensing system to ensure proper mix ratio and utilize mix nozzle to obtain adequate mixing.
3. Allow 24 hours at 22 °C for cure. Heat up to 93°C will speed curing. Maximum chemical resistance is achieved after seven days at 22°C.
4. Mixed product is free flowing and self leveling. Potting voids by moving the discharge point from the bottom up will give the best results.
5. Keep parts from moving during cure. Parts must be positioned to contain the product inside the potting voids during the cure.
6. Excessive uncured adhesive can be cleaned up with ketone type solvents.

Loctite Material Specification[LMS]
LMS dated November 30, 2010 (Resin) and LMS dated November 30, 2010 (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
(°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

Note
The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

Trademark usage

Reference 0.0