



Hysol[®] 3450[™]

November 2007

PRODUCT DESCRIPTION

Hysol[®] 3450[™] provides the following product characteristics:

Technology	Epoxy
Chemical Type	Epoxy
Appearance (Resin)	Black
Appearance (Hardener)	Creamy, white paste
Components	Two part - Resin & Hardener
Mix Ratio, by volume - Resin : Hardener	1 : 1
Cure	Room temperature cure after mixing
Application	Bonding

Hysol[®] 3450[™] is a two component epoxy adhesive which cures rapidly at room temperature after mixing. It is a metal bonding adhesive which develops high strength. The gap filling properties make this adhesive system suitable for rough and poorly fitting surfaces made from metal, ceramic, rigid plastics or wood. Applications include bonding aluminum window frames and GRP panels.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin Properties

Specific Gravity @ 25 °C	1.9
Viscosity, Brookfield, 25 °C, mPa·s (cP): Spindle 6, speed 10 rpm	40
Flash Point - See MSDS	

Hardener Properties

Specific Gravity @ 25 °C	1.8
Viscosity, Brookfield, 25 °C, mPa·s (cP): Spindle 6, speed 10 rpm	30
Flash Point - See MSDS	

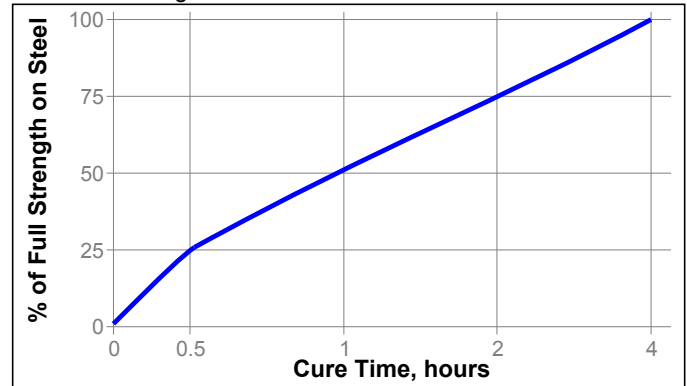
Mixed Properties

Pot Life @ 25 °C, minutes	4 to 6
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TYPICAL CURING PERFORMANCE

Cure Speed vs. Time, Temperature

The rate of cure will depend on the ambient temperature, elevated temperatures may be used to accelerate the cure. The graph below shows shear strength developed with time at various temperatures on grit blasted steel lap shears and tested according to ISO 4587.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Coefficient of Thermal Conductivity, ISO 8302, W/(m·K)	0.3
Tensile Modulus, ISO 527-3	N/mm ² 1,750 (psi) (253,750)

Electrical Properties:

Dielectric Breakdown Strength, IEC 60243-1, kV/mm	25
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TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 16 hours @ 40 °C, tested at 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)	N/mm ² 25 (psi) (3,600)
Steel (degreased)	N/mm ² 20 (psi) (2,900)
Aluminum (grit blasted)	N/mm ² 15 (psi) (2,200)
Aluminum (degreased)	N/mm ² 6 (psi) (870)
Wood	N/mm ² 5 (psi) (730)
Polycarbonate	N/mm ² 2 (psi) (290)
PVC (polyester resin matrix)	N/mm ² 1 (psi) (150)



TYPICAL ENVIRONMENTAL RESISTANCE

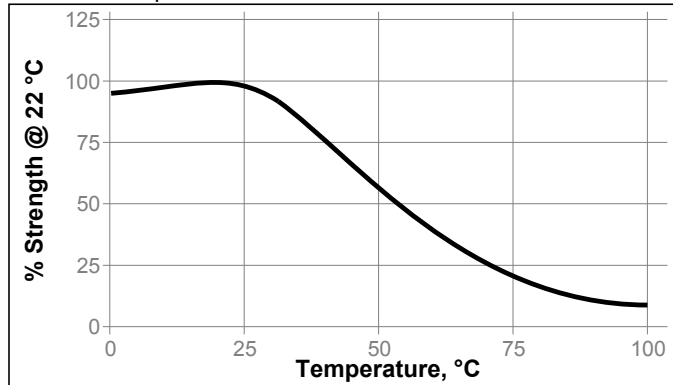
Cured for 24 hours @ 22 °C followed by 30 minutes @ 80 °C

Lap Shear Strength, ISO 4587:

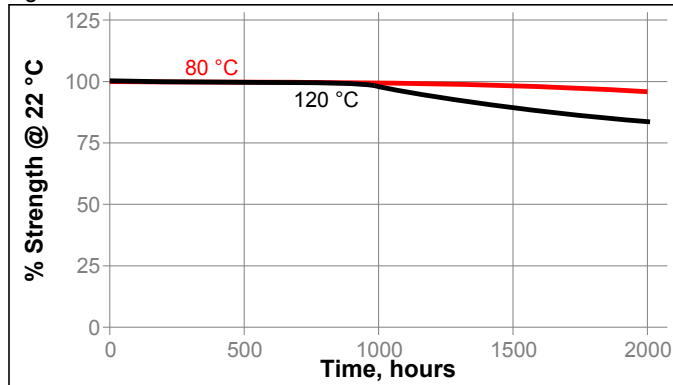
Aluminum (grit blasted)

Hot Strength

Tested at temperature

**Heat Aging**

Aged under conditions indicated and tested at 22 °C.

**Chemical/Solvent Resistance**

Aged under conditions indicated and tested at 22 °C.

Environment	°C	% of initial strength		
		750 h	1500 h	2000 h
Lubricating Oil	22	80	80	80
Acetic Acid, 10%	22	0	0	0
Ethyl Acetate	22	80	80	80
Gasoline	22	80	80	80
Industrial methylated spirits	22	70	70	70
Paraffin	22	100	100	100
Water	22	70	40	5
Water	60	50	50	35
Water	90	40	30	10
Humidity, 92% RH	40	65	55	20

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).

Where aqueous washing systems are used to clean the surfaces before bonding, it is important to check for compatibility of the washing solution with the adhesive. In some cases these aqueous washes can affect the cure and performance of the adhesive.

Directions for use

1. For best performance surfaces for bonding should be clean, dry and free of grease. For high strength structural bonds, special surface treatments can increase the bond strength and durability.
2. To use, resin and hardener must be blended. Product can be applied directly from dual cartridges by dispensing through the mixer head supplied. Discard the first 3 to 5 cm of bead dispensed. Using bulk containers, mix thoroughly by weight or volume in the proportions specified in the Product Description Matrix. For hand mixing, weigh or measure out the desired amount of resin and hardener and mix thoroughly. Mix approximately 15 seconds after uniform color is obtained.
3. **Do not mix quantities greater than 4 kg in mass as excessive heat build-up can occur. Mixing smaller quantities will minimize the heat build-up.**
4. Apply the adhesive as quickly as possible after mixing to one surface to be joined. For maximum bond strength apply adhesive evenly to both surfaces. Parts should be assembled immediately after mixed adhesive has been applied.
5. Working life of the mixed adhesive is 4 to 6 minutes @ 25 °C. Higher temperature and larger quantities will shorten this working time.
6. Keep the assembled parts from moving during cure. The joint should be allowed to develop full strength before subjecting to any service loads.
7. Excess uncured adhesive can be wiped away with organic solvent (e.g. Acetone).
8. After use and before adhesive hardens, mixing and application equipment should be cleaned with hot soapy water.

Not for product specifications

The technical data contained herein are intended as reference only. Please contact your local quality department for assistance and recommendations on specifications for this product.

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

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$

$\text{kV/mm} \times 25.4 = \text{V/mil}$

$\text{mm} / 25.4 = \text{inches}$

$\text{N} \times 0.225 = \text{lb}$

$\text{N/mm} \times 5.71 = \text{lb/in}$

$\text{N/mm}^2 \times 145 = \text{psi}$

$\text{MPa} \times 145 = \text{psi}$

$\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$

$\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$

$\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$

$\text{mPa}\cdot\text{s} = \text{cP}$

Note

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.

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Reference 1.2