



Hysol[®] 9466[™]

February 2006

PRODUCT DESCRIPTION

Hysol[®] 9466[™] provides the following product characteristics:

Technology	Epoxy
Chemical Type (Resin)	Epoxy
Chemical Type (Hardener)	Amine
Appearance (Resin)	White opaque paste
Appearance (Hardener)	White translucent liquid
Appearance (Mixed)	Off-white opaque paste
Components	Two component - requires mixing
Viscosity	Medium
Mix Ratio, by volume - Resin : Hardener	2 : 1
Mix Ratio, by weight - Resin : Hardener	100 : 50
Cure	Room temperature cure after mixing
Application	Bonding

Hysol[®] 9466[™] is a toughened, industrial grade epoxy adhesive with extended work life. Once mixed, the two component epoxy cures at room temperature to form a tough, off-white bondline which 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. Hysol[®] 9466[™] provides excellent bond strengths to a wide variety of plastics and metals. Typical applications include general purpose industrial applications requiring extended work life for adjusting parts during assembly.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin:

Specific Gravity @ 25 °C	1.0
Flash Point - See MSDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 6, speed 20 rpm	15,000 to 50,000

Hardener:

Specific Gravity @ 25 °C	1.0
Flash Point - See MSDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 5, speed 50 rpm	25,000 to 60,000

Mixed:

Working life, minutes	60
-----------------------	----

TYPICAL CURING PERFORMANCE

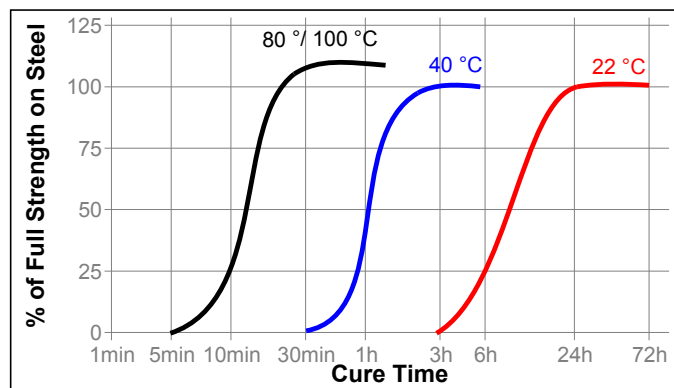
Fixture Time

Fixture time is defined as the time to develop a shear strength of 0.1 N/mm².

Fixture Time, ISO 4587, minutes:	
Steel (grit blasted)	180

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

Cured for 7 days @ 22 °C, 1.2 mm thick film

Physical Properties:

Glass Transition Temperature, ASTM E 1640, °C	62
Shore Hardness, ISO 868, Durometer D	60
Elongation, ISO 527-3, %	3
Tensile Strength, ISO 527-3	N/mm ² 32
	(psi) (4,640)
Tensile Modulus, ISO 527-3	N/mm ² 1,718
	(psi) (249,110)

Electrical Properties:

Dielectric Breakdown Strength, IEC 60243-1, kV/mm	30
---	----

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 5 days @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)	N/mm ² 37.0
	(psi) (5,365)
Aluminum (abraded)	N/mm ² 26.0
	(psi) (3,770)
Aluminum (anodised)	N/mm ² 17.9
	(psi) (2,595)
Galvanized Steel (Hot Dipped)	N/mm ² 8.5
	(psi) (1,230)
Stainless steel	N/mm ² 23.0
	(psi) (3,335)
Polycarbonate	N/mm ² 5.3
	(psi) (765)
Nylon	N/mm ² 1.6
	(psi) (230)
Wood (Fir)	N/mm ² 11.3
	(psi) (1,635)
GRP	N/mm ² 5.0
	(psi) (725)
ABS	N/mm ² 4.7
	(psi) (680)

180° Peel Strength, ISO 8510-2:

Steel (grit blasted)	N/mm	8.0
	(lb/in)	(45.5)

Tensile Strength, ISO 6922:

Steel pin (grit blasted) to Soda glass	N/mm ²	43.2
	(psi)	(6,260)

Impact Strength, ISO 9653, J/m² :

Steel (grit blasted)	5.8
----------------------	-----

Tensile Strength, ISO 6922, % of initial strength:

Steel pin (grit blasted) to Soda glass:

Environment	°C	% of initial strength	
		500 h	1000 h
98% RH	40	90	90

TYPICAL ENVIRONMENTAL RESISTANCE

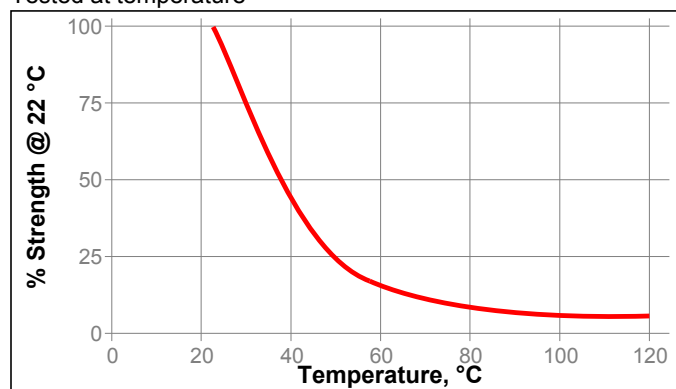
Cured for 5 days @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)

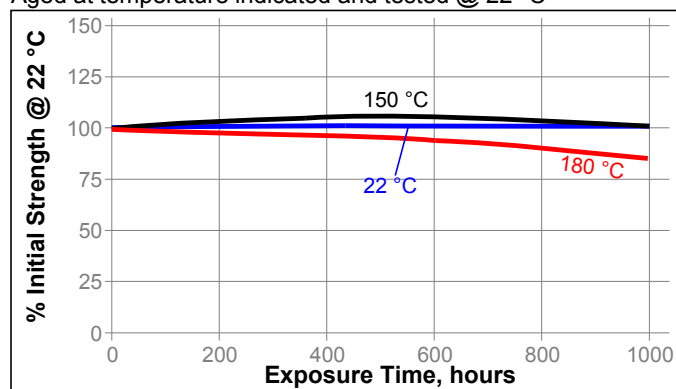
Hot Strength

Tested at temperature



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
Motor oil (10W-30)	87	135	145
Unleaded gasoline	22	95	125
Water/glycol 50/50	87	75	75
Salt fog	22	---	80
98% RH	40	85	90
Condensing Humidity	49	---	90
Water	22	---	90
Acetone	22	75	90
IPA	25	90	100

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.

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

- For best performance part surfaces should be clean and free of grease.
- For high strength structural bonds, remove surface contaminants such as paint, oxide films, oils, dust, mold release agents and all other surface contaminants.
- 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.
- Do not mix quantities greater than 4 kg as excessive heat build-up can occur. Mixing smaller quantities will minimise the heat build-up.
- 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.
- Keep assembled parts from moving during cure. The bond should be allowed to cure 24 hours before subjecting to any service loads.
- Excess uncured adhesive can be wiped away with organic solvent (e.g. Acetone).
- After use and before adhesive hardens mixing and dispensing 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

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

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

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

$\mu\text{m} / 25.4 = \text{mil}$

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

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

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

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

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

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

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

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

Note

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

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 1.1