

Hysol®

Hysol® 9464™

May 2006

PRODUCT DESCRIPTION

Hysol® 9464™ provides the following product characteristics:

Technology	Epoxy
Chemical Type (Resin)	Epoxy
Chemical Type (Hardener)	Amine
Appearance (Resin)	White opaque paste
Appearance (Hardener)	Black opaque paste
Appearance (Mixed)	Gray opaque paste
Viscosity	Thixotropic
Components	Two part - Resin & Hardener
Mix Ratio, by volume - Resin : Hardener	1 : 1
Mix Ratio, by weight - Resin : Hardener	100 : 100
Cure	Room temperature cure after mixing
Application	Bonding
Maximum Gap	3.0 mm
Specific Benefit	• Shortened pot life • Fast handling strength • Non-sag slump resistance • Easy to mix and use • Good tensile shear strength • Good peel strength • Heat accelerated cure
Key Substrates	Metals, Phenolic plastics, Polyester, Hard boards & forestry products, Ceramics, Rubbers, Masonry materials and other construction materials

Hysol® 9464™ is a faster cure version of Hysol® 9461™. The fixture time and pot life are reduced by approximately 50% while maintaining most of the performance of Hysol® 9461™.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin Properties

Specific Gravity @ 25 °C	1.35
Viscosity, DIN 54453, mPa·s (cP):	
Shear rate 10 s ⁻¹	137,600
Shear rate 100 s ⁻¹	40,360
Thixotropic Index	2
Flash Point - See MSDS	

Hardener Properties

Specific Gravity @ 25 °C	1.31
Viscosity, DIN 54453, mPa·s (cP):	
Shear rate 10 s ⁻¹	55,300
Shear rate 100 s ⁻¹	34,830
Thixotropic Index	1.5
Flash Point - See MSDS	

Mixed Properties

Pot Life @ 22 °C, minutes:	
100 g mass	15 to 20

TYPICAL CURING PERFORMANCE

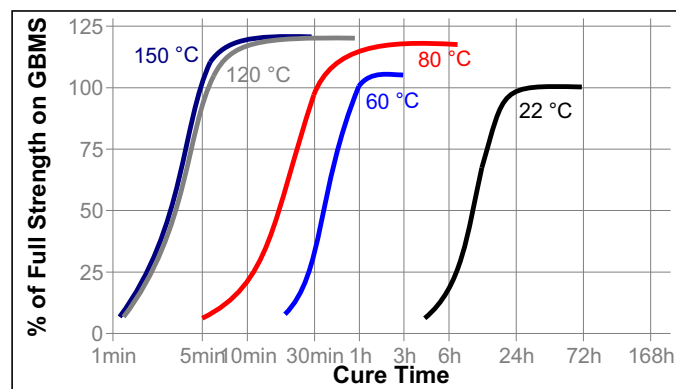
Fixture Time

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

Fixture Time, mixed, @ 22 °C, minutes 180

Cure Speed vs. Time/Temperature

Hysol® 9464™ will achieve handling strength in 3 to 4 hours at room temperature (note: this can vary with different bond configurations and ambient temperatures). Elevated temperatures may be used to accelerate the cure. The following graph indicates development of shear strength on mild steel (grit blasted) lapshears as a function of time and temperature tested according to ISO 4587.



TYPICAL PROPERTIES OF CURED MATERIAL

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

Physical Properties:

Shore Hardness, ISO 868, Durometer D 80

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 7 days @ 22 °C

Lap Shear Strength, ISO 4587:

Mild steel (grit blasted)	N/mm ²	22
	(psi)	(3,200)
Aluminum (abraded)	N/mm ²	18
(Silicon Carbide Paper, A166 grit, P400A grade)	(psi)	(2,600)
Aluminum(etched in acidic ferric sulphate)	N/mm ²	22
	(psi)	(3,200)
Stainless steel	N/mm ²	18
	(psi)	(2,600)
Brass	N/mm ²	9
	(psi)	(1,300)
Zinc dichromate	N/mm ²	15
	(psi)	(2,200)
Galvanized Steel (Hot Dipped)	N/mm ²	20
	(psi)	(2,900)

Polycarbonate	N/mm ²	3.8
	(psi)	(550)
ABS	N/mm ²	4.8
	(psi)	(700)
GRP (Polyester resin matrix)	N/mm ²	4.7
	(psi)	(680)

180° Peel Strength, ISO 8510-2:

Mild steel (grit blasted)	N/mm	10.5
	(lb/in)	(60)
Aluminum (acid etched)	N/mm	7
	(lb/in)	(40)

IZOD Impact Resistance, ISO 9653 J/m²:

Grit Blasted Mild Steel	9.6
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TYPICAL ENVIRONMENTAL RESISTANCE

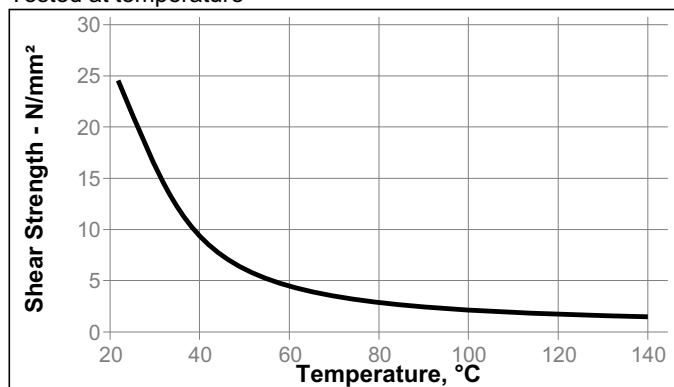
Cured for 7 days @ 22 °C

Lap Shear Strength, ISO 4587:

Mild Steel (grit blasted)

Hot Strength

Tested at temperature

**Heat Aging**

Stored at temperatures indicated and tested at 22°C.

Temperature	% Initial strength retained after		
	500 h	1,000 h	3,000 h
50 °C	150	115	140
80 °C	130	125	145
100 °C	125	130	135
120 °C	130	135	135
150 °C	150	140	140

Chemical/Solvent Resistance

Immersed in conditions indicated and tested at 22 °C.

Environment	°C	% of initial strength		
		500 h	1000 h	3000 h
Motor oil	22	100	100	100
Unleaded gasoline	22	95	75	60
50 % Water Glycol	87	60	60	50
4% Sodium Hydroxide / Water	22	50	55	50
98% RH	40	65	50	45
Water	60	70	65	65
Water	90	70	65	60
Acetone	22	85	35	15
Acetic Acid, 10%	22	80	70	45
7.5% Salt water solution	22	90	85	80

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. It is recommended that this product is not mixed and cured in bulk quantities of greater than 1 kg 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. For working life please see section 'Typical Properties of Uncured Material'. Higher temperatures 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

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Reference 1.0