



Research, Development & Engineering

Tallaght Business Park,
Dublin, Ireland

Technical Data Sheet Hysol® 9492

July 2003

PRODUCT DESCRIPTION

Loctite Hysol 9492 is a high temperature resistant, two component epoxy adhesive. It is a lower viscosity version of Hysol 9491 and retains the high performance features of this product:

- Very low outgassing
- High temperature resistance
- Excellent solvent resistance

TYPICAL APPLICATIONS

Hysol 9492 is a general purpose adhesive that bonds and repairs a wide variety of materials. Fully cured Hysol 9492 bonds offer superior thermal shock resistance, mechanical, electrical and impact resistant properties.

PROPERTIES OF UNCURED MATERIAL

Resin	Typical Value
Chemical Type	Epoxy
Appearance	White opaque paste
Specific Gravity @25°C	1.51
Brookfield RVT viscosity @25°C Spindle 6 @5rpm, mPas	50,000 to 120,000
Viscosity, DIN 54453, mPas D= 10s ⁻¹ D= 100s ⁻¹	45,000 34,000
Flash Point (TCC), °C (°F)	>93 (>200)

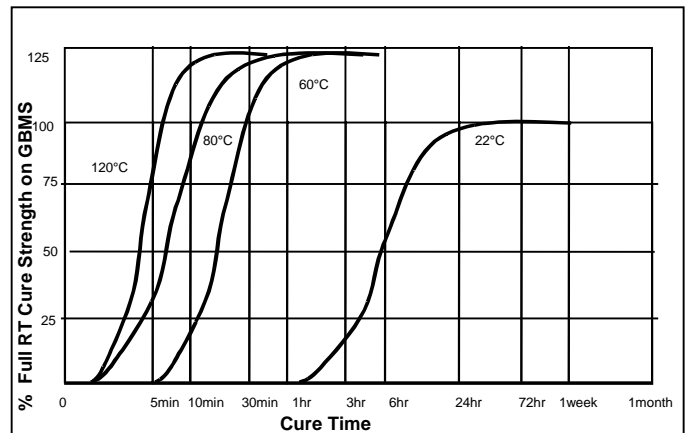
Hardener	Typical Value
Chemical Type	Modified Amine
Appearance	Grey opaque liquid
Specific Gravity @25°C	1.52
Brookfield RVT viscosity @25°C Spindle 7 @50rpm, mPas	20,000 to 50,000
Viscosity, DIN 54453, mPas D= 10s ⁻¹ D= 100s ⁻¹	27,000 20,000
Flash Point (TCC), °C (°F)	>93 (>200)

Mixed Adhesive	Typical Value
Appearance	White opaque paste
Mix Ratio by Volume (Resin/Hardener)	2:1
Mix Ratio by Weight (Resin/Hardener)	100:50
Maximum gap fill (mm)	1
Working Life of mixed adhesive @22°C (100g mix), minutes	15
Fixture Time (light handling, (0.1N/mm ²) @22°C, minutes	75

TYPICAL CURING PERFORMANCE

Cure Speed vs. time/temperature

Hysol 9492 develops complete cure within three days at room temperature. After 24 hours, approximately 90% of full cure properties are attained. Hysol 9492 will achieve light handling strength in 75 minutes at 22°C (Note: this can vary with different bond configurations). The following graph indicates development of shear strength on grit-blasted steel lapshears with 0.05mm gap as a function of time and temperature, tested according to ASTM D-1002/EN 1465. Note: Bond heat up time must be added to this cure time.



TYPICAL PROPERTIES OF CURED MATERIAL

(1.2mm thick samples cured for 7 days @22°C)

Physical Properties	Typical Value
Tensile Strength, ASTM D882, N/mm ²	31.0
Young's Modulus, ASTM D882, N/mm ²	6700
Elongation, ASTM D-882, %	0.8
Hardness, ASTM D1706, Shore D	80
Coefficient of Thermal Expansion, ASTM D 696 (-40° - 80°), m/m/ K	63 x 10 ⁻⁶
Coefficient of Thermal Conductivity, W/m/K ASTM C177-63	0.3
Compressive Strength, ASTM D695, N/mm ²	80

Electrical Properties	Typical Value
Dielectric Strength, ASTM D149, KV/mm	17.5
Dielectric Constant, MIL 1-16923. K 1kHz	6.1
Dissipation Factor, ASTM D 150 1kHz	0.09

PERFORMANCE OF CURED MATERIAL

(Cured for 7 days @22°C, unless otherwise stated)

Shear Strength, ASTM D1002/EN 1465 (0.05mm gap unless otherwise stated), N/mm ²	Typical Value (N/mm ²)
Steel, Grit Blasted Mild Steel (GBMS)	20
Aluminium, Abraded (Silicon Carbide Paper, A166 grit, P400A grade)	14
Aluminium, Etched in Acidic Ferric Sulphate	15
Stainless Steel	12
Brass	1
Hot Dipped Galvanised Steel	2.2
Zinc Dichromate	6
Polycarbonate	5.3
ABS	3
GRP (Polyester Resin Matrix)	5
PVC	1.9
Epoxy (Glass Fibre Reinforced Epoxy)	7
IZOD Impact Resistance, ISO 9653/ASTM D950-98, Steel, GBMS, J/m ²	3.7
180° Rigid Peel Strength, ASTM D1876 Steel, GBMS, N/mm	1.6

NOT FOR PRODUCT SPECIFICATIONS.

THE TECHNICAL DATA CONTAINED HEREIN ARE INTENDED AS REFERENCE ONLY.

PLEASE CONTACT LOCTITE CORPORATION QUALITY DEPARTMENT FOR ASSISTANCE AND RECOMMENDATIONS ON SPECIFICATIONS FOR THIS PRODUCT.
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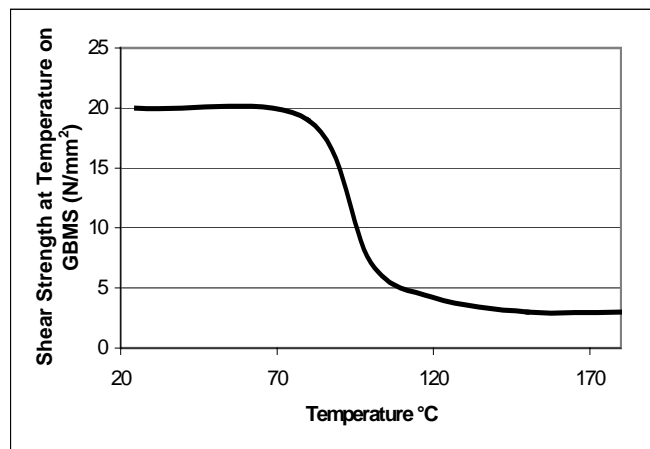
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TYPICAL ENVIRONMENTAL RESISTANCE

Test procedure :	ASTM D1002/EN 1465
Substrate:	Grit Blasted Mild Steel (GMBS)
Bondline gap:	0.05 mm
Cure procedure:	7 days @22°C

Hot Strength

Tested at temperature.

**Temperature Storage.**

Cured for 5 days @22°C. Stored in air at temperature indicated and tested @22°C.

Temperature	% Initial Strength retained after			
	100hr	500hr	1000hr	3000hr
100°C	125	140	140	130
125°C	140	135	130	135
150°C	120	120	120	110
180°C	130	90	65	30

Chemical/Solvent Resistance

Cured for 5 days @22°C. Immersed in conditions indicated and tested @22°C.

Solvent	Temp.	% Initial Strength retained after		
		500hr	1000hr	3000hr
Motor Oil	22°C	115	115	115
Unleaded Petrol	22°C	115	115	115
50% Water Glycol	87°C	130	110	105
4% NaOH/water	22°C	125	110	115
98% Relative Humidity	40°C	105	105	105
Water	60°C	130	120	120
Water	90°C	95	85	85
Acetone	22°C	80	70	65
10% Acetic Acid	22°C	105	95	95
7.5% Salt water solution	22°C	105	100	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 oxidising materials.

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

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 3-5cm of bead dispensed. Using bulk containers, mix thoroughly by weight or volume in the proportions specified in Properties of Uncured Material section. For hand mixing, weigh or measure out the desired amount of resin and hardener and mix thoroughly. Mix approximately 15 seconds after uniform colour is obtained.
3. Do not mix quantities greater than 0.5kg as excessive heat build-up can occur. Mixing smaller quantities will minimise 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 15 minutes at 22°C. Higher temperature and larger quantities will shorten this working time.
6. Excess uncured adhesive can be wiped away with organic solvent (e.g. acetone).
7. Keep the assembled parts from moving during cure. The joint should be allowed to develop full strength before subjecting to any service loads.
8. After use and before adhesive hardens mixing and application equipment should be cleaned with hot soapy water.

Storage

Product shall be ideally stored in a cool, dry location in unopened containers at a temperature between 8°C to 21°C (46°F to 70°F) unless otherwise labelled. Optimal storage is at the lower half of this temperature range. To prevent contamination of unused product, do not return any material to its original container. For further specific shelf life information, contact your local Technical Service Centre.

Data Ranges

The data contained herein may be reported as a typical value and/or range. Values are based on actual test data and are verified on a periodic basis.

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, **Loctite Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Loctite Corporation's products. Loctite 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 Loctite 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.

Bulk Numbers: **Part A: 210032**
Part B: 210033