



Research, Development & Engineering

Tallaght Business Park,
Dublin, Ireland

Technical Data Sheet Hysol® 9496

July 2003

PRODUCT DESCRIPTION

Loctite Hysol 9496 is a two component, room temperature curing, low shrinkage, epoxy potting resin system.

TYPICAL APPLICATIONS

The high thermal conductivity and low shrinkage during cure of this product makes it suitable for low stress applications such as potting electronic components.

PROPERTIES OF UNCURED MATERIAL

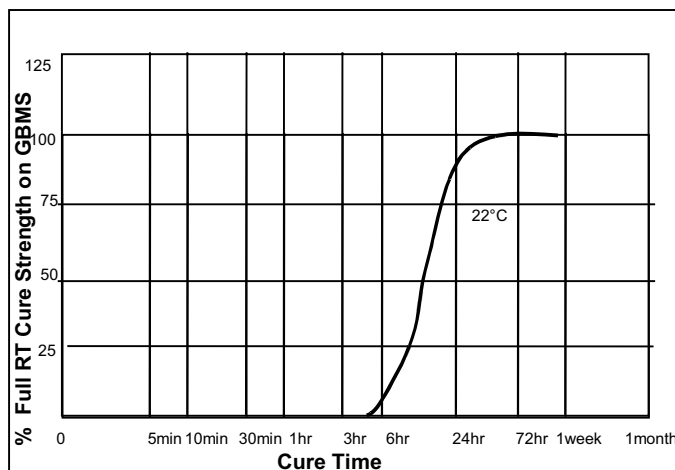
Resin	Typical Value
Chemical Type	Epoxy
Appearance	Black opaque paste
Specific Gravity @25°C	2.3
Brookfield RVT viscosity @25°C Spindle 7 @50rpm, mPas	15,000 to 40,000
Viscosity, DIN 54453, mPas D= 10s ⁻¹	28,000
D= 100s ⁻¹	15,000
Thixotropic Index	1.5
Flash Point (TCC), °C (°F)	>93 (>200)

Hardener	Typical Value
Chemical Type	Amine
Appearance	Light brown translucent liquid
Specific Gravity @25°C	1.0
Brookfield RVT viscosity @25°C Spindle 3 @20rpm, mPas	200 to 320
Flash Point (TCC), °C (°F)	>93 (>200)

Mixed Adhesive	Typical Value
Appearance	Black opaque paste
Mix Ratio by Volume (Resin/Hardener)	6:1
Mix Ratio by Weight (Resin/Hardener)	100:7
Viscosity, DIN 54453, mPas D= 10s ⁻¹	2,600
Maximum gap fill (mm)	1
Working Life of mixed adhesive @22°C (100g mix), minutes	120
Fixture Time (light handling, 0.1N/mm ²) @22°C, hours	6-7

Curing Performance

Hysol 9496 develops complete cure after three days at room temperature. After 24 hours, approximately 85% of full cure properties are attained. Hysol 9496 will achieve handling strength in 6-7 hours at 22°C (Note: this can vary with different bond configurations). Elevated temperatures may be used to accelerate the cure. The following graph indicates development of shear strength on a grit blasted mild steel lapshears with 0.05mm gap as a function of time and temperature, tested according to ASTM D-1002/EN 1465.



TYPICAL PROPERTIES OF CURED MATERIAL

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

Physical Properties	Typical Value
Hardness, ASTM D1706, Shore D	89
Coefficient of Thermal Expansion, ASTM D696	28 x 10 ⁻⁶
m/m/ K	
Coefficient of Thermal Conductivity, W/m/K ASTM C177-63	1.7
Tensile Strength, ASTM D-882 N/mm ²	67
Compressive Strength, ASTM E695, N/mm ²	96
Dielectric Strength, ASTM D149, KV/mm	28

PERFORMANCE OF CURED MATERIAL

(7day cure at @22°C, tested at @22°C)

Shear Strength, ASTM D1002/EN 1465 (0.05mm bond gap unless otherwise stated)	Typical Value (N/mm ²)
Steel, Grit Blasted Mild Steel (GBMS)	17
Stainless Steel	9
Zinc Dichromate	10
Aluminium, Abraded (Silicon Carbide Paper, A166 grit, P400A grade)	9
Aluminium, Etched in Acidic Ferric Sulphate	11
Hot Dipped Galvanised Steel	4.7

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.
ROCKY HILL, CT FAX: +1 (860)-571-5473 DUBLIN, IRELAND FAX: +353-(1)-451 - 9959

A Henkel Company

Brass	3.7
GRP (Polyester Resin Matrix)	2
ABS	4.6
Epoxy (Glass Fibre Reinforced Epoxy)	19.5
Polycarbonate	3

180° Rigid Peel Strength, ASTM D1876 Steel, GBMS, N/mm	4.7
---	-----

IZOD Impact Resistance ISO9653/ASTM D950-98, Steel, GBMS, J/m ²	4.5
---	-----

TYPICAL ENVIRONMENTAL RESISTANCE

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

Heat Ageing

Stored in air at temperature indicated and tested @22°C.

Temperature	% Initial Strength retained after		
	500 hr	1000 hr	3000 hr
100°C	112	114	142
120°C	150	146	133
150°C	115	102	97
180°C	94	89	93
200°C	84	63	57

Chemical/Solvent Resistance

Immersed in conditions indicated and tested @22°C

Solvent	Temp.	% Initial Strength retained after			
		100 hr	500 hr	1000 hr	3000 hr
Motor Oil	22°C	-	100	100	97
Unleaded Petrol	22°C	-	100	93	89
50% Water Glycol	87°C	109	75	72	50
4% NaOH/water	22°C	-	88	81	
98% Relative Humidity	40°C	100	100	78	75
Water	60°C	94	80	64	58
Water	90°C	64	52	43	27
Acetone	22°C	-	86	84	84
10% Acetic Acid	22°C	-	77	69	53
7.5% Salt water solution	22°C	-	91	80	75

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. Before mixing part A (Resin) and part B (Hardener), part A must be homogeneous and should be stirred appropriately before use. 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 4kg 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 120 minutes at 22°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 dispensing 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: 210014**
 Part B: 210015