LOCTITE®

Research, Development & Engineering
Tallaght Business Park,
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Technical Data Sheet
Hysol® 9483

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PRODUCT DESCRIPTION

Loctite Hysol 9483 is a low viscosity, industrial grade epoxy adhesive. Once mixed, the two-part epoxy cures at room temperature with minimal shrinkage and forms an ultra clear adhesive bondline with excellent impact resistance. When fully cured, the epoxy withstands exposure to a wide range of chemicals and solvents, and has excellent dimensional stability over a wide temperature range.

TYPICAL APPLICATIONS

Suitable for bonding and potting where optical clarity and high strength are required. Ideal for bonding decorative panels and displays.

PROPERTIES OF UNCURED MATERIAL

Resin	Typical Value
Chemical Type	Epoxy
Appearance	Clear liquid
Specific Gravity @25°C	1.1
Brookfield RVT viscosity @25°C Spindle 6 @20rpm, mPas	8,000 to 14,000
Thixotropic Index	1
Flash Point (TCC), °C (°F)	>93 (>200)

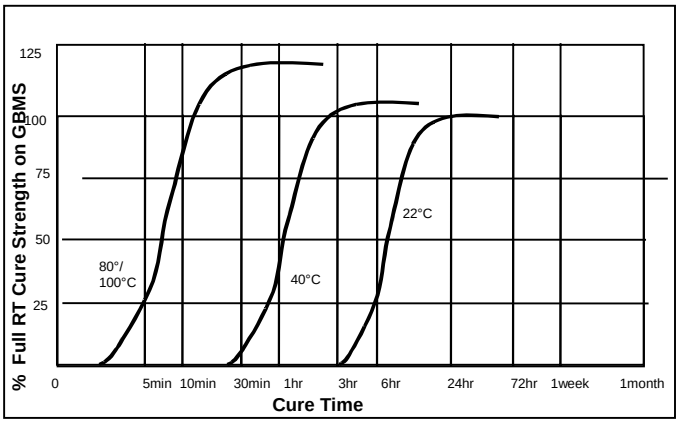
Hardener	Typical Value
Chemical Type	Amine
Appearance	Clear Liquid
Specific Gravity @ 25°C	1.0
Brookfield RVT viscosity @25°C Spindle 5 @50rpm, mPas	1,000 to 4,000
Thixotropic Index	1
Flash Point (TCC), °C (°F)	>93 (>200)

Mixed Adhesive	Typical Value
Appearance	Ultra clear paste
Mix Ratio by Volume (Resin/Hardener)	2:1
Mix Ratio by Weight (Resin/Hardener)	100:46
Brookfield Viscosity @ 25°C, mPas	3,000 to 11,000
Maximum gap fill (mm)	0.25
Working Life of mixed adhesive @22°C (100g mix), minutes	30
Fixture Time (light handling, 0.1N/mm²) @22°C, minutes	210

TYPICAL CURING PERFORMANCE

Cure speed

Hysol 9483 develops complete cure after three days at room temperature. After 24 hours, approximately 95% of full cure properties are attained. Hysol 9483 will achieve handling strength in 4-5 hours @ 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. Note: Bond heat up time must be added to this cure time.



TYPICAL PROPERTIES OF CURED MATERIAL

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

Physical Properties	Typical Value
Dielectric Strength, kV/mm	30
Tensile Strength, ASTM D882, N/mm²	47
Elongation, ASTM D882, %	3.2
Modulus, ASTM D882, N/mm²	2100
Coefficient of Thermal Expansion, ASTM E831	
(19° - 44°), µm/m/°C	50
(56° - 199°), µm/m/°C	164
Hardness, ASTM D1706, Shore D	65

PERFORMANCE OF CURED MATERIAL

(Cured for 5 days @22°C)

Shear Strength, ASTM D1002/EN 1465 (0.05mm gap unless otherwise stated)	Typical Value (N/mm²)
Steel, Grit-Blasted Mild Steel (GBMS)	23
Aluminium, Abraded (Silicon Carbide Paper, A166 grit, P400A grade)	10
Aluminium, Anodised	21.2
Stainless Steel	10
Polycarbonate	3.3
Nylon	2.4
Wood (Fir)	12.1
ABS	4
GRP (Polyester Resin Matrix)	2
Epoxy (Glass Fibre Reinforced Epoxy)	12.5

Tensile strength, ASTM D2095/EN 26922 GBMS pin to soda glass, N/mm²	13.3

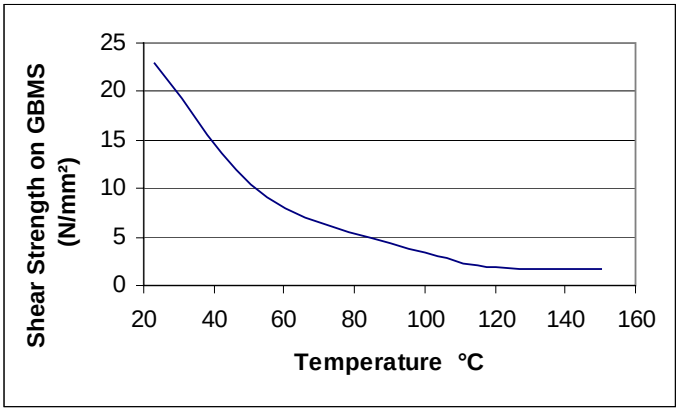
180° Rigid Peel Strength, ASTM D1876 Steel, GBMS, N/mm	1.5

TYPICAL ENVIRONMENTAL RESISTANCE

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

Hot Strength

Tested at temperature indicated.



Temperature Storage

Cured for 5 days @ 22°C on GBMS lapshears with no induced gap, stored in air at temperature indicated and tested @ 22°C.

Temperature	% Initial Strength retained after	
	500 hr	1000 hr
120°C	160	160
150°C	148	157

Chemical/Solvent Resistance

Cured for 5 days at 22°C on GBMS lapshears with no induced gap, immersed in conditions indicated and tested at 22°C.

Solvent	Temp.	% Initial Strength retained after	
		500 hr	1000 hr
Air	87°C	159	152
Motor Oil (10W-30)	87°C	160	146
Unleaded Petrol	22°C	123	111
Water/Glycol (50%/50%)	87°C	117	108
Salt/Fog ASTM B-117	22°C	73	89
98% Relative Humidity	40°C	108	104
Condensing Humidity	49°C	93	94
Water	22°C	104	90
Acetone	22°C	104	109
Isopropyl Alcohol	22°C	124	124

Tensile Strength, ASTM D2095/EN 26922, GBMS pin to soda glass			
Air	22°C	180	188
98% Relative Humidity	40°C	158	165

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).

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.

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 500g 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 30 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: 210006**
Part B: 210007