LOCTITE

1001 Trout Brook Crossing
Rocky Hill, CT 06067-3910
Telephone: (860) 571-5100
FAX: (860) 571-5465

Product Description Sheet

Loctite Hysol® Product 9437

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Description

Loctite® Hysol® 9437 is a high-service temperature aluminum filled, two component epoxy structural adhesive formulated for easy mixing. Hysol 9437 features a one-to-one mix ratio volume in a low sag, low viscosity paste for easy dispensing. 9437 is an excellent structural adhesive for the bonding of metals and thermoset laminates such as sheet molding compounds (SMC) in high service temperature applications. Hysol 9437 withstands severe "under the hood" conditions, surviving even 300°F motor oil and boiling ethylene glycol environments.

Features

High Service Temperature
Withstands Severe Environments
Machineable, Sandable
1:1 Mix Ratio
Easily Mixed and Dispensed
Room Temp or Heat Cure
Bonds SMC and Thermosets

Typical Uncured Properties	Part A	Part B	Mixed
Pot Life @ 75°F, 100 grams mins	--	--	50
Color	Gray	White	Gray
Viscosity, cP	30,000 to 90,000	25,000 to 75,000	40,000 to 44,000
Specific Gravity	1.41	1.28	--
Mix Ratio			
By weight	100	90	--
By volume	1	1	--
Density, Lbs/Gal	11.7	10.6	--

Typical Properties	Typical Value
Tensile Strength, psi, ASTM D 638	4500
Modulus, psi, ASTM D 638	640,000
Elongation, %, ASTM D 638	1.0
Hardness, Shore D	50

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).

Handling

Mixing: This product requires mixing two components together just prior to application. Complete mixing is necessary. The temperature of the separate components prior to mixing is not critical, but they should be close to room temperature.

Application

Applying: Bonding surface should be clean, dry, and properly prepared. Once the adhesive is dispensed, the bonded parts should be held in contact until the part has developed handling strength.

Mixing - Cartridges**:** Place cartridge in proper dispenser. To begin using a new cartridge, remove the cap and dispense a small amount of adhesive, making sure both parts A & B are extruding. Attach nozzle and dispense approximately 1-2" before applying onto the part to be bonded. Partially used cartridges should be stored with the mixing nozzle attached. To reuse, remove and discard the old nozzle, attach the new nozzle, and begin dispensing.

Curing: Hysol 9437 is designed to give ultimate properties in three days at room temperature. Handling strength will develop sooner; refer to the shear strength table on the following page. 9437 can be heat cured up to 250°F to reduce cure time. For example, 60 minutes @ 180°F or 30 @ 250°F are acceptable cure schedules for 9437. Studies have shown that 9437 can be cured in heated fixtures to achieve rapid handling strength. By this method, direct heat is applied in order to gel the adhesive; ultimate strengths are obtained later at room temperature.

Clean Up**:** It is important to clean up excess adhesive from work area and application equipment before it hardens. Denatured alcohol and many common industrial solvents are suitable for removing uncured adhesive. Consult suppliers for information pertaining to the safe and proper use of solvents.

Tensile Lap Shear on Thermosets

Tensile lap shear strength was tested per ASTM D3163 on dry wiped engineering thermoset laminates versus temperature to illustrate the temperature resistance of 9437. Test results reported from 1" wide by 1" overlap specimens having a 30 mil bondline tested at a crosshead speed of 0.5 inches per minute. The specimens cured overnight at room temperature and were then post cured for 30 minutes at 250°F.

Shear Strength, psi, ASTM D 1002 Thermoset Plastic Substrates		
	Test Temp °F	Typical Value
Eagle Picher SLI-224-V, SMC	77	400
	180	220
Gencorp 7113, SMC	77	500
	180	320
Budd DSM-950, SMC	77	450
	180	380
	250	250
	300	50
Premix 60401, SMC	77	450
	180	250
	250	200
	300	80
Arimax 1100, RTM	77	1000
	180	850
	250	300
	300	120
Lytex 9063	77	850
	180	800
	250	400
	300	100

Performance

Tensile Lap Shear Strength on Metals per ASTM D1002 versus test temperature, metal substrate, and surface preparation after curing Hysol 9437 overnight at room temperature followed by a 30 minute post cure at 250°F. Bondline thickness is 5 mils except where noted.

Shear Strength, psi, ASTM D 1002 Metal Substrates		
	Test Temp °F	Typical Value
Etched Aluminum	-67	3000
	77	3000
	180	2000
	250	750
	300	300
Degreased Aluminum	77	2000
	180	2000
	250	300
	300	100
Gritblasted CR Steel	77	3000
	180	2500
	250	500
	300	200
Degreased CR Steel	77	3000
	180	2500
	250	500
	300	100
Black Elpo Primed Steel	77	1250
	180	1400
	250	350
	300	100

Environmental Resistance on SMC

Environmental resistance reported as tensile lap shear strength per ASTM D3163 tested at room temperature on dry wiped Budd DSM-950 SMC after environmental exposure for 30 days in typical “under the hood” automotive fluids. Test results reported from 1” wide by 1” overlap specimens having a 30 mil bondline tested at 0.5 inches per minute crosshead speed. All specimens were post cured for 30 minutes at 250°F following a 24 hour RT cure to simulate an automotive paint bake. Specimens were allowed to recover at RT for 24 hours prior to testing.

Shear Strength after Environmental Exposure psi,	
	Typical Value
Control	450
Boiling Water	250
Ethylene Glycol/ Water 50/50 @ 77°F	440
Boiling Ethylene Glycol/ Water 50/50	250
Automatic Transmission Fluid @ 77°F	400
Brake Fluid @ 77°F	450
Windshield Wiper Fluid @ 77°F	420
10W-40 Motor Oil @ 77°F	450
10W-40 Motor Oil @ 285°F	450
Unleaded Gasoline @ 77°F	400
Diesel Fuel @ 77°F	450
300°F Heat	450
400°F Heat	300

Floating Roller Peel Strength

Floating roller peel strength tested at 77°F on etched aluminum per ASTM D3167 after curing overnight at room temperature followed by a 30 minute post cure at 250°F. Test results reported from 10 mil bondline specimens tested at 6” inches per minute crosshead speed.

Test Temperature, °F	Peel Strength, pli
77	5

PACKAGING

Quart, one gallon, five gallon, and drum systems
50 ml and 200 ml cartridges

Storage

Store product in unopened container in a cool dry location. Ideal conditions are within the range 8 to 21 degrees C (46 to 70 degrees F) and are recommended for long term storage. Exposure to higher temperatures (greater than 28 degrees C) for prolonged periods should be avoided as extended exposure to warm conditions can adversely affect product properties. For further specific shelf life information, contact your local Technical Service Center.

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.