



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

Laboratory Data Sheet

Product 3413

Industrial Version, December 2000

PRODUCT DESCRIPTION

LOCTITE® Product 3413 is a two component long work-time statically mixed acrylic adhesive that cures at room temperature to form high strength structural bonds to a wide variety of substrates. Because the product is low odor and non-flammable, it is very worker friendly. The product offers high peel and impact resistance and excellent adhesion to both plastics and metals. Its non-sag dispensing properties make it ideal for filling large gaps, dispensing on vertical surfaces, and manual dispensing. When fully cured, the adhesive is resistant to moisture and most common solvents.

TYPICAL APPLICATIONS

Loctite Product 3413 is ideal for structural bonding of metals, most plastics, composites and ceramics where a non-flammable, low odor product is needed. Typical applications include structural bonding for sports and leisure, general industrial, and automotive applications. Its long work time allows for repositioning of parts during assembly.

PROPERTIES OF UNCURED MATERIAL

Adhesive	Typical Value
Chemical Type	Methacrylate
Appearance	Off-white liquid
Specific Gravity @ 25°C	1.24
Viscosity @ 25°C, mPa.s (cP)	
Spindle #7, 2.5 rpm	200,000
Flash Point, TCC, °C (°F)	>93 (>200)

Activator	Typical Value
Chemical Type	Methacrylate
Appearance	Light purple liquid
Specific Gravity @ 25°C	1.24
Viscosity @ 25°C, mPa.s (cP)	
Spindle #7, 2.5 rpm	200,000
Flash Point, TCC, °C (°F)	>93 (>200)

Mixture	Typical Value
Appearance	Pale yellow/straw opaque gel
Specific Gravity @ 25°C	1.24
Mix Ratio (R:H) by Weight	1 to 1
by Volume	1 to 1
Work life, minutes	80 to 85
Fixture time, minutes @ 25°C	120 to 135

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties	Typical Value
Hardness, ASTM D2240, Shore D	67
Shrinkage, *, %	1
Tensile Properties, ASTM D882	
Tensile stress @ break, psi	2,020
Elongation @ break, %	N/A
Modulus, psi	42,900

* Product cured in 2 1/2" X 5/16" test tubes for 7 days @ Room Temp. Shrinkage calculated from the difference between the ID of test tube and the OD of the cured product.

PERFORMANCE OF CURED MATERIAL

Shear Strength vs Substrate

(Substrates cured for 2 days @ 22°C)

Substrate	Typical Value
Lapshear , ASTM D-1002	psi
Grit-blasted Steel	2,610
Aluminum, as received	2,200
Polycarbonate	1,610
Nylon	410
Block Shear , ASTM D-4501	psi
PVC	1,490
ABS	2,300
G-10 Epoxy	3,070
Acrylic	2,540
Peel Strength , ASTM D-1876	piw
Aluminum, as received, 0.005" gap	5.1
Steel, grit blasted, 0.005" gap	13.5
Impact Strength , GM Side Impact Test 9751P	kJ/m²
Steel	>21

TYPICAL ENVIRONMENTAL RESISTANCE

Test procedure :	ASTM D-1002
Substrate:	Steel
Bondline gap, mils:	5
Cure procedure:	1 week @ room temperature

Hot Strength

	% of initial Strength @		
Room Temp %	200°F	250°F	300°F
100	15	7	3

Heat Aging

Temp °F	Room Temp %	% of initial Strength @			
		500 hours	1000 hours	1,500 hours	2,000 hours
225	100	163	150	149	145
275	100	110	93	102	84

Solvent Resistance

	% of initial Strength @			
	Temp °F	Room Temp %	1,000 hours	2,000 hours
Relative Humidity, 100%	120	100	45	39
Salt Fog	95	100	41	36
Isopropyl Alcohol	72	100	96	93
Water/Glycol	150	100	82	13
Motor Oil	150	100	96	93
Gasoline	150	100	139	154

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).

Directions for use

1. For high strength structural bonds, remove surface contaminants such as paint, oxide films, oils, dust, mold release agents.
2. Use gloves to minimize skin contact. DO NOT use solvents to clean hands.
3. **Dual Cartridges:** To use simply insert the cartridge into the application gun and start the plunger into the cylinders using light pressure on the trigger. Next, remove the cartridge cap and expel a small amount of adhesive to be sure both sides are flowing evenly and freely. If automatic mixing of resin and hardener is desired, attach the mixing nozzle to the end of the cartridge and begin dispensing the adhesive. For hand mixing, expel the desired amount of the adhesive and mix thoroughly. Mix approximately 15 seconds after uniform color is obtained. **Bulk Containers:** Mix thoroughly by weight or volume in the proportions specified in Properties of Uncured Material section. Mix vigorously approximately 15 seconds after uniform color is obtained.
4. For maximum bond strength apply adhesive evenly to one of the surfaces to be joined.
5. Application to the substrates should be made within the work life of the product. Larger quantities and/or higher temperatures will reduce this working time.
6. Join the adhesive coated surfaces and allow to cure at 25°C (77°F) for 24 hours for high strength.
7. Keep parts from moving during cure. Contact pressure is necessary.
8. Excess uncured adhesive can be cleaned up with ketone type solvents.
9. Because of the rapid curing rate of this product, mixed adhesive in large quantities may become hot. Testing is suggested for heat sensitive parts.

Storage

Product shall be ideally stored in a cool, dry location in unopened containers at a temperature between 8°C to 28°C (46°F to 82°F) unless otherwise labeled. 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 Center.

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.