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# Technical Data Sheet

## Hysol® Product E-214HP

formerly Durabond E-214HP

Industrial Version, March 2006

### PRODUCT DESCRIPTION

LOCTITE® Hysol® Product E-214HP is a light paste, industrial grade epoxy adhesive. This one-component, no-mix, heat activated formulation develops tough, strong, structural bonds which provide excellent peel resistance and impact strength. When fully cured, the product offers superior thermal shock resistance, excellent mechanical and electrical resistant properties, and withstands exposure to a wide variety of solvents and chemicals.

### TYPICAL APPLICATIONS

Bonds to a wide variety of materials, including metals, glass, ceramics and plastics.

### PROPERTIES OF UNCURED MATERIAL

Single Component	Value	Typical Range
Chemical Type	Epoxy	
Appearance	Light Grey Paste	
Specific Gravity @ 25°C	1.11	1.0 to 1.2
Viscosity, Brookfield – RVT, 25 °C, mPa.s (cP)		
Spindle 7, speed 1 rpm		2,000,000 to 3,000,000
Spindle 7, speed 2.5 rpm		800,000 to 1,500,000
Flash Point (TCC), °C (°F)	>93 (>200)	

### TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties	Typical Value
Dielectric Strength, Volts/Mil	550
Tensile Strength ASTM D638, N/mm <sup>2</sup> (psi)	4460
Tensile Elongation ASTM D-638, %	6.5
Hardness ASTM D-1706, Shore D	85
Glass Transition Temperature, T <sub>g</sub> , °C	120
Cure Schedule: 40 minutes @ 120°C	40

### PERFORMANCE OF CURED MATERIAL

#### Shear Strength vs Substrate

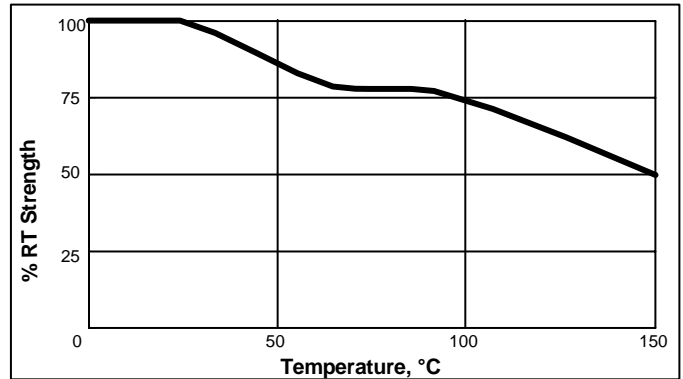
Substrates cured 2 hours at 120°C & 4 hours at 22°C with no induced gap.)

Substrate	Typical Value	
Lapshear	N/mm <sup>2</sup>	(psi)
Grit-Blasted Steel	33.2	4820
Aluminum (Abraded/Acid Etched, 8 mil thickness)	33.7	4880
Aluminum (Anodized)	8.4	1220
Stainless Steel	36.8	5340
Polycarbonate	9.9	1430
Nylon	1.2	180
Wood (Fir)	5.0	720
Block Shear	N/mm <sup>2</sup>	(psi)
PVC	5.2	760
ABS	-	-
Epoxy	9.2	1330
Acrylic	3.7	530
Glass	23.2	3370

### TYPICAL ENVIRONMENTAL RESISTANCE

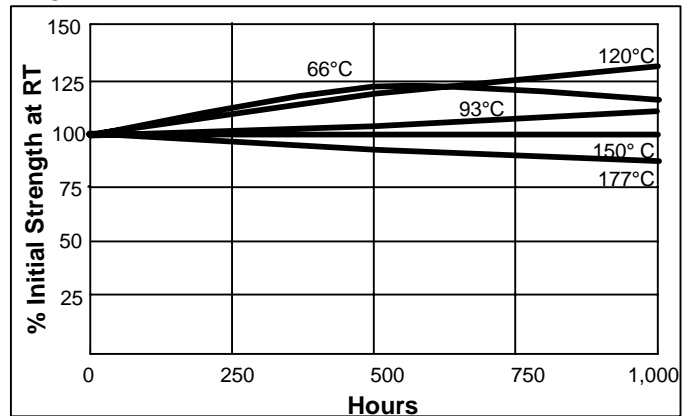
#### Hot Strength

Test procedure : ASTM D-1002  
Substrate: Abraded, acid etched aluminum  
Bondline gap, mils: 5 to 9  
Cure procedure: 2 hours at 120°C & 4 hours at 22°C  
Tested at temperature.



### Heat Aging

Cured for 2 hours at 120°C & 4 hours at 22°C on steel with no induced gap, aged at temperature indicated and tested at 22°C.



### Chemical / Solvent Resistance

Cured 2 hours at 120°C & 4 hours at 22°C on steel with no induced gap, aged under conditions indicated and tested at 22°C.

Solvent	Temp.	% Initial Strength retained at	
		500 hr	1000 hr
Air	87°C	90	78
Motor Oil (10W-30)	87°C	97	95
Unleaded Gasoline	87°C	110	114
Water/Glycol (50%/50%)	87°C	85	81
Salt/Fog ASTM B-117	22°C	47	58
95% Relative Humidity	38°C	75	71
Condensing Humidity	49°C	58	49
Water	22°C	70	70
Acetone	22°C	111	102
Isopropyl Alcohol	22°C	120	114

### 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).

**Note:** Loctite Product E-214HP reacts quickly when exposed to temperatures above 120°C. The product evolves heat (exotherms) during the solidification reaction. Care should be taken to avoid the use of Product E-214HP in sections greater than 0.25 inches to avoid excessive heat build during the exothermic reaction which causes rapid expansion, blistering or cracking of the product.

#### Directions for use

1. For high strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must be completely removed. However, the amount of surface preparation directly depends on the required bond strength and the environmental aging resistance desired by the user. For specific surface preparations on common substrates, see the following section of Surface Preparation.
2. Use gloves to minimize skin contact. DO NOT use solvents for cleaning hands.
3. For maximum bond strength apply adhesive evenly to both surfaces to be joined.
4. Join the adhesive coated surfaces and allow to cure at 120°C (250°F) or above until completely firm. Heat up to 150°C (300°F) for 2 hours, will maximize properties.
5. Keep parts from moving during cure. Contact pressure is necessary. Maximum shear strength is obtained with a 3-5 mil bond line.
6. Excess uncured adhesive can be cleaned up with ketone type solvents.

#### 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 0°C (32°F) or less. 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.