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Product Description Sheet

Product 422

Industrial Products, October 1998

PRODUCT DESCRIPTION

LOCTITE® Superbonder 422 is a fast-setting, single component, general industrial grade cyanoacrylate adhesive. 422 is specifically formulated for applications requiring higher viscosity and slower fixturing speeds than other instant adhesives. Superbonder 422 is economical to use and develops strong bonds on most metals, plastics and rubber.

TYPICAL APPLICATIONS

- Bonding of a wide range of metal, plastic or elastomeric materials
- Rough or irregular surfaces
- Applications requiring alignment times up to 20 seconds

MILITARY SPECIFICATION COMPLIANCE

Superbonder 422 conforms to:
MIL-A-46050C Type II, Class III

PROPERTIES OF UNCURED MATERIAL

	Typical Value
Chemical Type	Ethyl cyanoacrylate
Appearance	Clear liquid
Specific Gravity @ 25°C	1.05
Viscosity @ 25°C, mPa.s (cP)	
ASTM D 1084, Method B	2500
Vapor pressure, mbar:	<1
Flash Point (COC),	>176°F (>80°C)

FIXTURING TIME

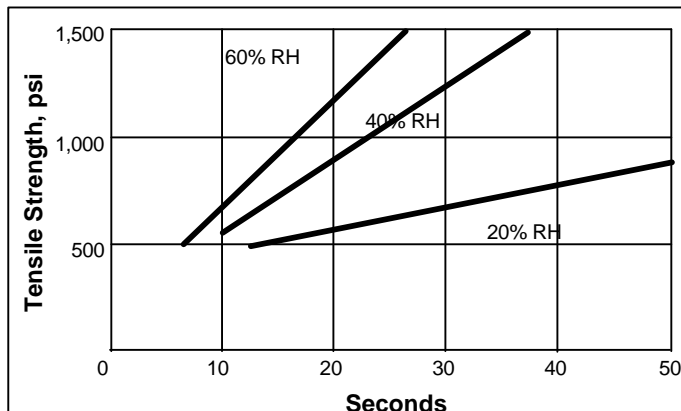
This is defined as the number of seconds after assembly when the Superbonder 422 joint develops a shear strength of 14.5 lb/in.² or 0.1 N/mm² measured at 72°F/22°C, 50% relative humidity according to ASTM D 1002 and DIN 53283. This cure speed is affected by the nature of the substrate, ambient humidity and temperature. In general, the thinner the bond line, the faster the fixture.

Performance of **Loctite Superbonder 422** on metallic and non-metallic substrates:

Substrate	Typical fixturing Time (sec.)
Steel (degreased)	35
Aluminum (etched)	20
Zinc dichromate:	70
Neoprene rubber	<5
Nitrile rubber	<5
ABS	30
PVC	35
Polycarbonate	50
Phenolic materials	25

All surfaces were cleaned with isopropyl alcohol wipe. Times and strengths can vary considerably for different grades of plastics, elastomers and plated metals.

The effect of relative humidity on cure speed is shown in the graph for Superbonder 422 cyanoacrylate adhesive to Buna N rubber.



TYPICAL CURING PERFORMANCE

When fixture time is inadequate due to low relative humidity or large gaps, Loctite Tak Pak® Accelerator 7452 or Loctite Tak Pak® 712 Accelerator may be used. This can, however, lead to a reduction in eventual strength of the bond; careful testing is recommended before use in production. Although full function strength is developed in a relatively short time, curing continues for at least 24 hours before full chemical and solvent resistance is developed.

BLOOMING/FROSTING

Vapor generated by uncured liquid adhesive can deposit on nearby surfaces leaving a white residue. This condition can be reduced by one or more of the following methods:

- Reduce quantity of adhesive used
- Increase air flow over the parts
- Use accelerator to speed fixture/cure of exposed wet adhesive
- Deposit can be removed with Loctite X-NMS™768 Clean Up Solvent

STRESS CRACKING

Uncured liquid adhesives can cause cracking of some plastics when they are in a stressed condition. Examples are polycarbonate, acrylic and polysulfone. The possibility of stress cracking can be reduced by the following:

- Close joints quickly to avoid prolonged exposure to liquid adhesive
- Use accelerator to speed fixture/cure of adhesive
- Use reinforced grades of plastic which are more resistant to chemical attack

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties

Coefficient of thermal expansion, ASTM D696, K ⁻¹	100x10
Coefficient of thermal conductivity, ASTM C177, W.m ⁻¹ K ⁻¹	0.1
BTU-in hr-ft ² -°F	2.1

Electrical Properties

Dielectric constant, ° ASTM D150:

50 Hz	2.3
1 kHz	2.3
1 Mhz	2.3

Dissipation factor, ASTM D 150

measured at :100Hz	<0.02
1kHz:	<0.02
10 kHz:	<0.02

Surface resistivity x 10

4

Volume resistivity, ASTM D257, $\Omega \cdot \text{cm} \times 10^{16}$

1

Dielectric strength, ASTM D149, kV/mm

25

PERFORMANCE OF CURED MATERIAL

(After 1 week at 72°F (22°C))

Typical Value

Shear Strength, ASTM D1002, DIN 53283

Grit Blasted Steel, N/mm² 22
(psi) (3200)

Etched Aluminum, N/mm² 15
(psi) (2200)

Zinc dichromate 7
(1000)

ABS, N/mm² 6*
(psi) (850*)

PVC, N/mm² 6*
(psi) (850*)

Polycarbonate, N/mm² 5*
(psi) (700*)

Phenolic, N/mm² 10
(psi) (1450)

Neoprene rubber, N/mm² 10
(psi) (1450)

Nitrile rubber, N/mm² 10
(psi) (1450)

Peel Strength, ASTM D1876, DIN 53282

Degreased steel, N/mm <0.5
(piw) <2.9

* Adhesive exceeds strength of bonded materials

TYPICAL ENVIRONMENTAL RESISTANCE

Test Procedure : Shear Strength ASTM-D1002/DIN 53283

Substrate: Grit blasted mild steel

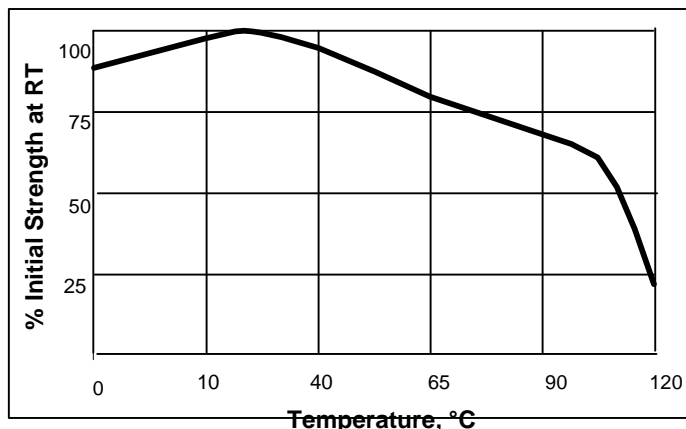
Cure procedure: 1 week at 72°F (22°C)

Hot Strength

Shear strength test procedure: ASTM D1002 (DIN53283)

Substrate: Grit blasted mild steel

Cure procedure: 1 week at 72°F (22°C)

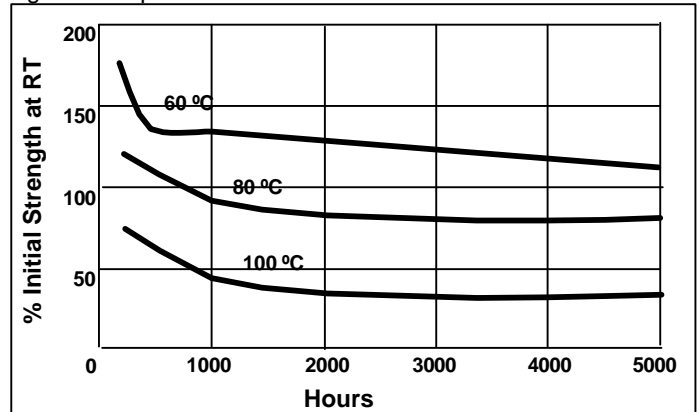
**GENERAL INFORMATION**

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).

Heat Aging

Aged at temperature indicated and tested at 22°C.

**Chemical / Solvent Resistance**

Aged under conditions indicated and tested at 22°C.

Solvent	Temp		%Initial strength retained at		
	°F	°C	100 hr	500 hr	1000 hr
Motor Oil	104	40	100	100	95
Gasoline	72	22	100	100	100
Isopropanol	72	22	100	100	100
Freon TA	72	22	100	100	100
Ethanol	72	22	100	100	100

Directions for use

For best performance surfaces should be clean and free of grease. This product performs best in thin bond gaps, (0.05mm). Excess adhesive can be dissolved with Loctite clean up solvents, nitromethane or acetone.

Storage

Products shall be ideally stored in a cool, dry location in unopened containers at a temperature between 8° to 21°C (46° to 70°F) unless otherwise labeled. Optimal storage conditions of cyanoacrylate products are achieved with refrigeration: 2° to 8°C (36° to 46°F). Refrigerated packages shall be allowed to return to room temperature prior to use. To prevent contamination of unused product, do not return any material to its original container. For 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.