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Technical Data Sheet

Product 294

Industrial Products, November 1998

PRODUCT DESCRIPTION

LOCTITE® Product 294 is a **high temperature**, single component, low viscosity anaerobic threadlocking material which develops medium to high strength. The product cures when confined in the absence of air between close fitting metal surfaces and is particularly suitable for wicking into preassembled components. The product also provides good threadlocker performance with oil coated fasteners.

TYPICAL APPLICATIONS

Prevents loosening and leakage of threaded fasteners. Particularly suitable for elevated temperature applications where assembly and positioning is required before applying the threadlocker. The very low viscosity allows penetration of the joint by capillary action.

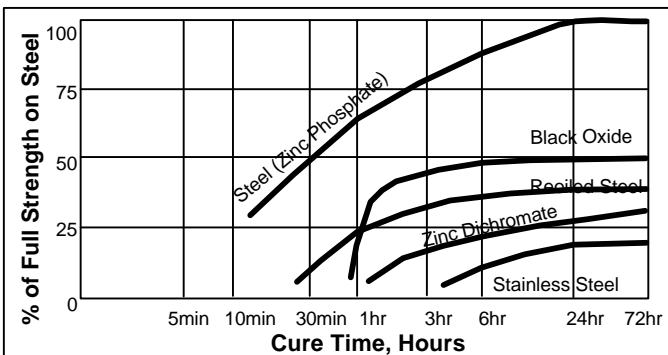
PROPERTIES OF UNCURED MATERIAL

	Typical Value	Range
Chemical Type	Dimethacrylate ester	
Appearance	Green, Fluorescent Liquid	
Specific Gravity @ 25°C	1.13	
Viscosity @ 25°C, mPa.s (cP)	34.5	33 to 37
Brookfield LVDV 50 rpm		
Flash Point (Penske-Martens), °C	>93	

TYPICAL CURING PERFORMANCE

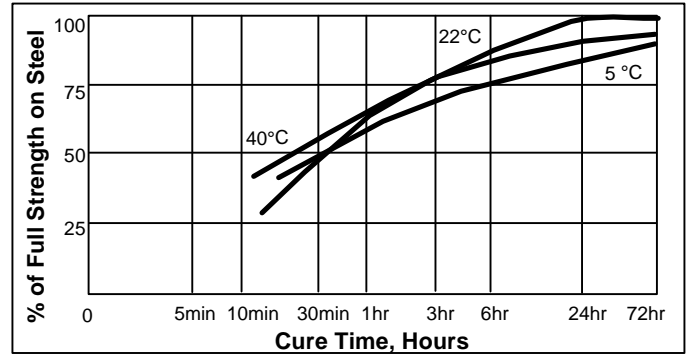
Cure speed vs. substrate

The rate of cure will depend on substrate used. The following graph shows the breakaway strength developed with time on M10 Zinc Phosphate Steel nuts and bolts compared to different materials and tested according to ISO 10964.



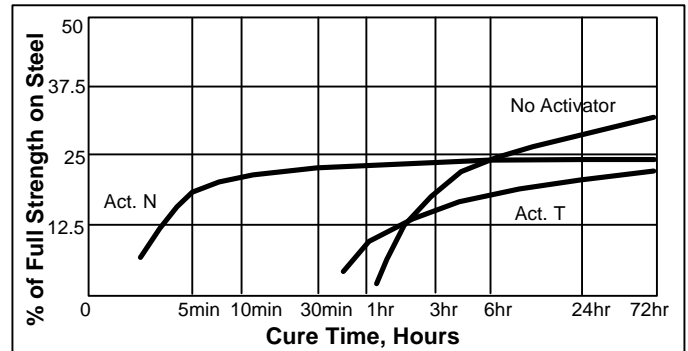
Cure speed vs. temperature

The rate of cure is not dependent on the ambient temperature. Graph below shows the breakaway strength developed with time at different temperatures on M10 Zinc Phosphate Steel nuts and bolts and tested according to ISO 10964.



Cure speed vs. activator

Where cure speed is unacceptably long, or large gaps are present, applying ACTIVATOR N to the surface will improve cure speed. The graph below shows breakaway strength developed with time using ACTIVATOR N and T on M10 Zinc Dichromate Steel nuts & bolts and tested according to ISO 10964.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties

Coefficient of thermal conductivity, ASTM C177, W.m⁻¹ K⁻¹ 0.173

PERFORMANCE OF CURED MATERIAL

(After 24 hr at 22°C on M10 Zinc Phosphate Steel nuts & bolts)

	Value	Typical Range
Breakaway Torque, ISO 10964, N.m	33	29 to 36
(lb.in)	(289)	(257 to 321)
Prevail Torque, ISO 10964, N.m	27	21 to 32
(lb.in)	(237)	(188 to 286)
Breakloose Torque, Pretorqued 5 N.m	38	35 to 41
(44 lb.in)	(336)	(313 to 359)
Max. Prevail Torque, Pretorqued 5 N.m	35	26 to 44
(44 lb.in)	(312)	(232 to 392)

NOT FOR PRODUCT SPECIFICATIONS

THE TECHNICAL DATA CONTAINED HEREIN ARE INTENDED AS REFERENCE ONLY.

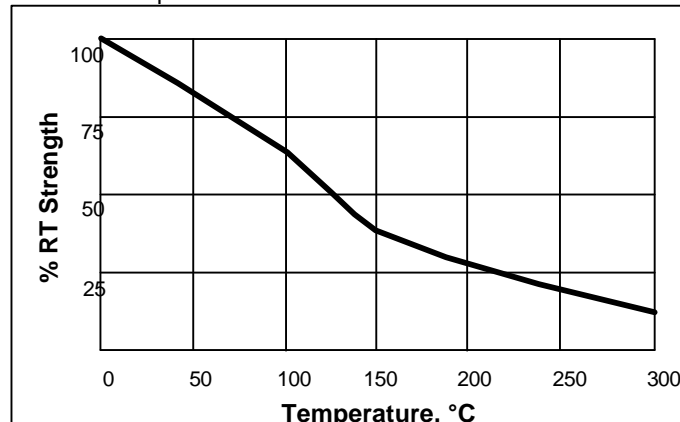
PLEASE CONTACT LOCTITE CORPORATION QUALITY DEPARTMENT FOR ASSISTANCE AND RECOMMENDATIONS ON SPECIFICATIONS FOR THIS PRODUCT.
ROCKY HILL, CT FAX: +1 (860)-571-5473 DUBLIN, IRELAND FAX: +353-(1)-451 - 9959

TYPICAL ENVIRONMENTAL RESISTANCE

Test Procedure : Breakloose Torque, ISO 10964
 Substrate: M10 Zinc Phosphate nuts & bolts
 Cure procedure: 72 hours at 22°C
 Pre-torqued to 5 N.m (44 lb.in)

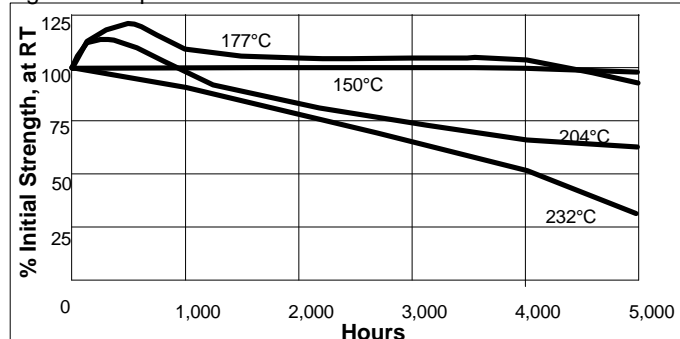
Hot Strength

Tested at temperature.



Heat Aging

Aged at temperature indicated and tested at 22°C.



Chemical / Solvent Resistance

M10 Zinc Phosphate Steel nuts and bolts pretorqued to 5N.m (44 lb.in), aged under conditions indicated and tested at 22°C.

Solvent	Temp.	% Initial Strength retained at			
		100 hr	500 hr	1,000 hr	5,000 hr
Motor Oil	125°C	80	64	63	46
Unleaded Gasoline	22°C	100	100	100	100
Brake Fluid	22°C	100	100	100	96
Water/Glycol (50%/50%)	87°C	80	72	64	56
Ethanol	22°C	100	100	100	100
Acetone	22°C	98	100	97	93

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).

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. In some cases these aqueous washes can affect the cure and performance of the adhesive.

This product is not normally recommended for use on plastics (particularly thermoplastic materials where stress cracking of the plastic could result). Users are recommended to confirm compatibility of the product with such substrates.

Directions for use

For best performance surfaces should be clean and free of grease. Product should be applied to the bolt in sufficient quantity to fill all engaged threads. This product performs best in thin bond gaps, (0.05mm). Very large thread sizes may create large gaps which will affect cure speed and strength. This product is not designed to give controlled friction, (torque/tension ratio), during assembly. In critical tightening applications this ratio should be determined.

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.