

Technical Data Sheet Nuts N' Bolts[®] 419

December 2009

Page 1 of 3

Product Description

Hernon[®] Nuts N' Bolts[®] 419 is a one component, anaerobic material which has low strength for easy disassembly. Curing occurs only when the adhesive is confined between mating surfaces. **Nuts N' Bolts[®] 419** prevents loosening through vibration and leakage of threaded fasteners.

Typical Applications

- Adjustment screws
- Machine screws
- Setscrews

Product Benefits

- Single component
- Will not cure outside the joints
- Cures without cracking or shrinking
- No mixing
- Prevents rusting of threads
- Seals against leakage
- Prevents movement of screw threads and eliminates self loosening

Typical Properties (Uncured)

Property	Value
Chemical type	Dimethacrylate ester
Appearance	Purple fluorescent liquid
Viscosity @ 77°F (25°C), cP	130
Specific gravity	1.07
Flash point	See MSDS
Temperature Range, °F	-65 to 300

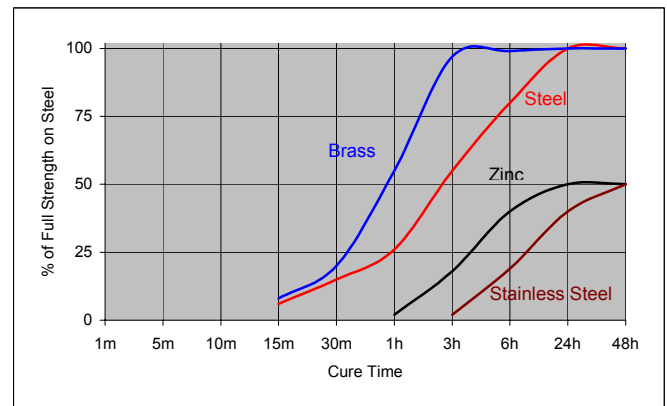
Typical Properties (Cured)

Property	Value
Coefficient of thermal expansion, ASTM D696 (K ⁻¹)	100x10 ⁻⁶
Coefficient of thermal conductivity, ASTM C 177, W/(m·K)	0.1

Typical Curing Performance

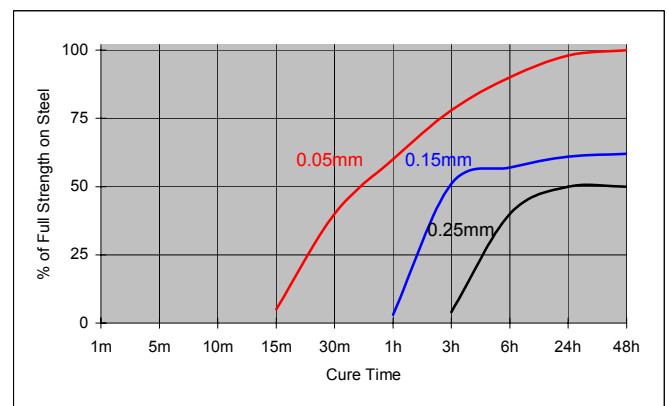
Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the breakaway strength developed with time for different materials on M10 nuts and bolts - tested according to ISO 10964.



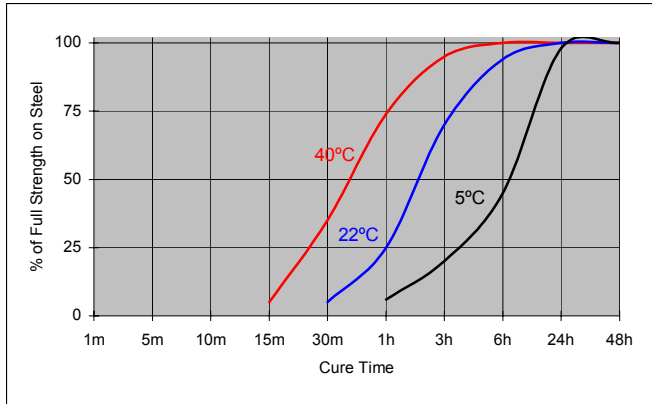
Cure Speed vs. Bond Gap

The rate of cure will depend on the bondline gap. Gaps in threaded fasteners depends on thread type, quality and size. The following graph shows shear strength developed with time on steel pins and collars at different controlled gaps and tested according to ISO 10123.



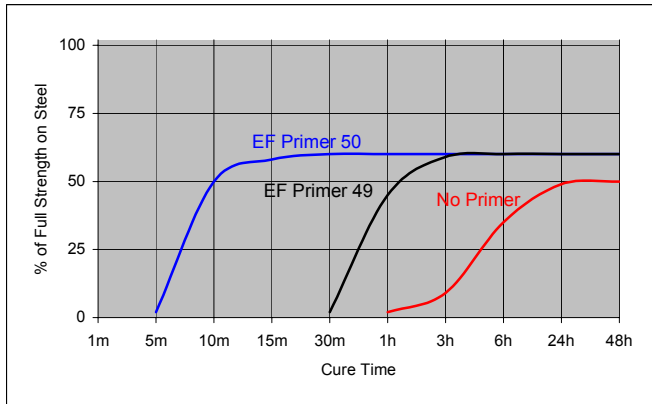
Cure Speed vs. Temperature

The rate of cure will depend on the temperature. The graph below shows the breakaway strength developed with time at different temperatures on M10 black oxide nuts and bolts - tested according to ISO 10964.



Cure Speed vs. Primer

When cure speed is unacceptably long (because of substrate, temperature or gap), performance may be improved by treating the surface with **EF® Primer 49 or 50**. The graph below shows breakaway strength developed with time using **EF® Primer 49 and 50** on M10 zinc dichromate steel nuts and bolts and tested according to ISO 10964.



Typical Cured Performance

Tested on M10 nuts and bolts according to ISO 10964. Cured and tested at 22°C

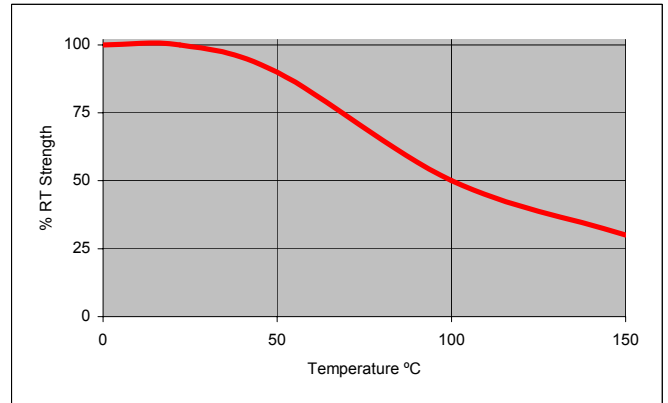
Cure	Substrate	Torque	N•m (in-lb)
60 Mins.	Steel	Breakaway	2.8 to 11.3 (25 to 100)
		Prevailing	1.1 to 5.6 (10 to 50)
24 Hrs.	Steel	Breakaway	5.6 to 11.3 (50 to 100)
		Prevailing	2.3 to 5.6 (20 to 50)
	Plated	Breakaway	1.1 to 4.5 (10 to 40)
		Prevailing	1.1 to 4.5 (10 to 40)

Typical Environmental Resistance

Cured for 1 week @ 22°C
Breakloose Torque, ISO 10964, Pretorqued to 5 N•m:
M10 zinc phosphate steel nuts and bolts

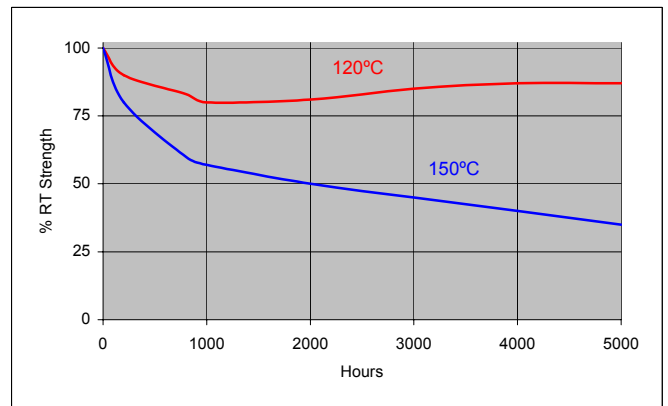
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested at 22°C



Chemical/Solvent Resistance

Aged under conditions indicated and tested at 22°C.

Chemical/Solvent	Temp (°C)	% of Initial Strength		
		100 hr	500 hr	1000 hr
Water Glycol 50/50	87	85	80	80
Brake fluid	22	95	95	90
Ethanol	22	95	95	95
Unleaded Gasoline	22	95	95	95
Motor Oil	125	100	95	95

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). It is recommended to confirm compatibility of the product with such substrates.

Directions For Use

For best performance surfaces should be clean and free of grease. **Nuts N' Bolts® 419** should be applied to the bolt in sufficient quantity to fill all engaged threads.

Disassembly and Cleanup

To aid in disassembly anaerobic compounds can be weakened by heating to at least 500°F (260°C). Once disassembled, cured adhesive can be removed with **Hernon® Gasket Remover 30**.

Storage

Nuts N' Bolts® 419 should be stored in a cool, dry location in unopened containers at a temperature between 46°F to 82°F (8°C to 28°C) unless otherwise labeled. Optimal storage is at the lower half of this temperature range. To prevent contamination of unused material, do not return any material to its original container.

Dispensing Equipment

Hernon® offers a complete line of semi and fully automated dispensing equipment. Contact **Hernon® Sales** for additional information.

These suggestions and data are based on information we believe to be reliable and accurate, but no guarantee of their accuracy is made. HERNON MANUFACTURING®, INC. shall not be liable for any damage, loss or injury, direct or consequential arising out of the use or the inability to use the product. In every case, we urge and recommend that purchasers, before using any product in full scale production, make their own tests to determine whether the product is of satisfactory quality and suitability for their operations, and the user assumes all risk and liability whatsoever, in connection therewith. Hernon's Quality Management System for the design and manufacture of high performance adhesives and sealants is registered to the ISO9001 Quality Standard.