HERNON®
High Performance Adhesives and Sealants
ISO 9001 Registered

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Technical Data Sheet
Nuts N' Bolts® 422

Product Description

Hernon® Nuts N' Bolts® 422 is a medium strength, general purpose threadlocking compound, ideal for all nut and bolt applications. Especially well-suited for ¼" or larger fasteners. Removable with hand tools. Curing occurs only when adhesive is confined between two mating surfaces. The cured adhesive is a thermoset plastic suitable for temperatures up to 300ºF and exposure to most solvents.

Typical Applications

- Hydraulic piston nuts
- Rocker nuts
- Typewriter screws
- Railroad bolts on wear plates
- Carburetor adjusting screws
- Machinery keys
- Machine tool access bolts
- Conveyer roller bolts
- Gear box bolts
- Bearing cover cap screws
- Drive shaft fasteners
- Mounting bolts on motors, pumps, etc
- Shaft coupling bolts

Product Benefits

- High temperature resistance.
- Prevents movement of screw threads and eliminates self-loosening
- Seals against leakage
- Prevents rusting of threads
- Cures without cracking or shrinking

Performance Testing

Each batch of **Nuts N' Bolts®422** is tested to the lot requirements of MIL-S-46163A (Type I Grade J), and to the detail requirements of ASTM D5363 (AN0231).

Typical Properties (Uncured)

Property	Value
Chemical type	Dimethacrylate ester
Appearance	Blue fluorescent liquid
Viscosity @ 77ºF (25ºC), cP	130
Specific gravity	1.07
Flash point	See MSDS

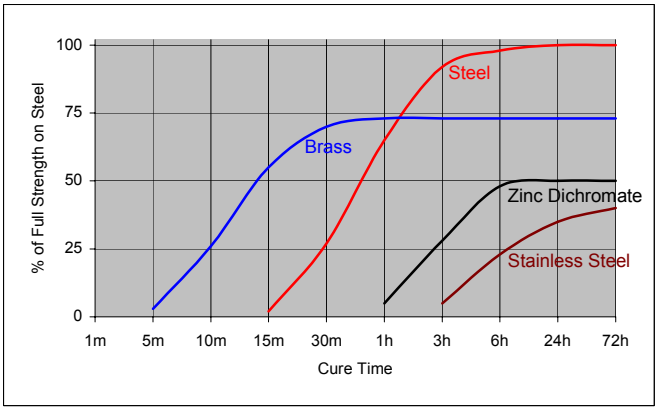
Typical Properties (Cured)

Property	Value
Coefficient of thermal expansion, ASTM D696 (K^{-1})	0.1
Coefficient of thermal conductivity, ASTM C 177, W/(m·K)	0.1
Temperature Range, ºF	-65 to 300

Typical Curing Performance

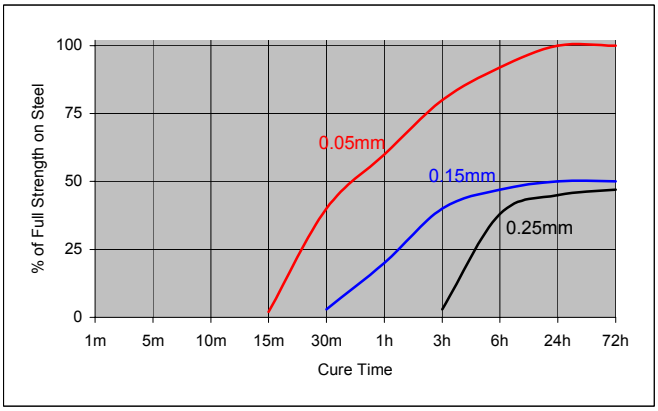
Cure Speed vs. Substrate

The graph below shows breakaway strength developed with time on M10 nuts and bolts made from different materials tested according to ISO 10964.



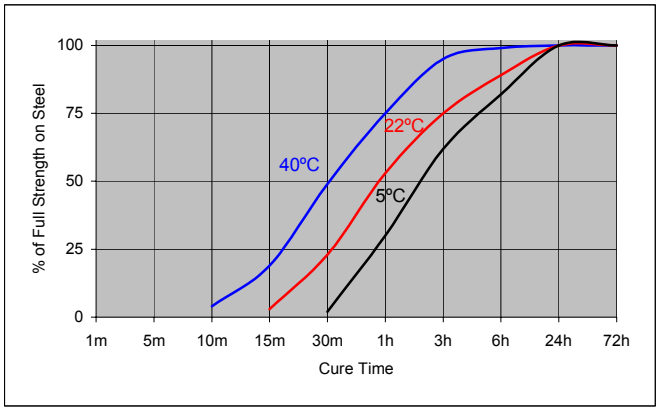
Cure Speed vs. Bond Gap

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.



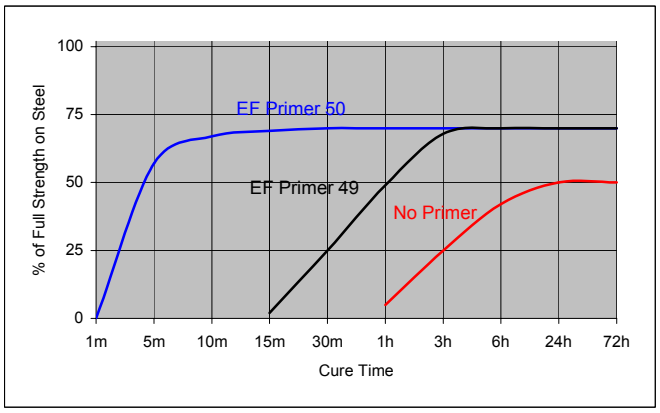
Cure Speed vs. Temperature

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 **Hernon® 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 3/8 x 16 grade 2 nuts and grade 5 bolts according to ISO 10964. Cured and tested at 22ºC

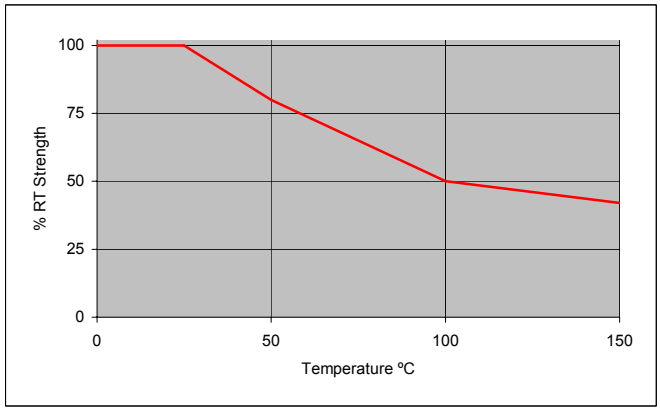
Cure	Substrate	Torque	N•m (in-lb)
90 Mins.	Steel	Breakaway	5.6 to 22.6 (50 to 200)
		Prevailing	2.8 to 16.9 (25 to 150)
24 Hrs	Steel	Breakaway	11.3 to 22.6 (100 to 200)
		Prevailing	5.6 to 16.9 (50 to 150)
	Plated	Breakaway	3.4 to 22.6 (30 to 200)
		Prevailing	2.3 to 22.6 (20 to 200)

Typical Environmental Resistance

Cured for 1 week @ 22ºC
Breakloose Torque, DIN 54454, N•m
M10 zinc phosphate steel nuts and bolts

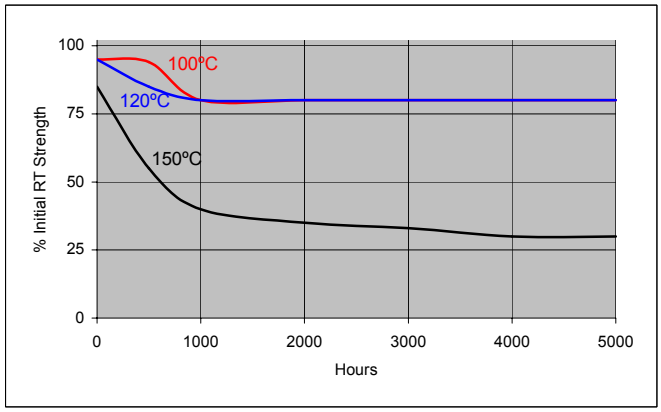
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested at 22°C



Chemical/Solvent Resistance

Aged under conditions indicated and tested at 22ºC.

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

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 cue 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® 422** 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 500ºF (260ºC). Once disassembled, cured adhesive can be removed with **Hernon® Gasket Remover 30**.

Storage

Nuts N' Bolts® 422 should be stored in a cool, dry location in unopened containers at a temperature between 46ºF to 82ºF (8ºC to 28ºC) 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.