

Technical Data Sheet Nuts N' Bolts[®] 429

April 2006

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Product Description

Hernon[®] Nuts N' Bolts[®] 429 is a single component anaerobic thread locking adhesive. **Nuts N' Bolts[®] 429** is a high-strength adhesive for locking and sealing large bolts and studs 1inch and larger diameters. Curing occurs only when adhesive is confined between mating surfaces. The cured adhesive is a thermoset plastic suitable for temperatures up to 300°F (149°C) and exposure to most solvents.

Typical Applications

- Locking studs into marine motor housing.
- Rock-crusher studs
- Locomotive studs
- Hydraulic press studs (large diameter)
- Cylinder liner studs
- Snow plow blade bolts
- Submarine studs

Product Benefits

- Prevents loosening of threaded parts
- Prevents rusting of threads
- Seals against leakage
- Cures without cracking or shrinking
- Easily applied with **Hernon[®]** application equipment
- Low inventory-fits wide range of bolt sizes
- Single component-no mixing
- No curing outside of joint

Typical Properties (Uncured)

Property	Value
Chemical Type	Dimethacrylate ester
Appearance	Red fluorescent liquid
Viscosity @ 77°F (25°C), cP	6,000 to 8,000
Specific gravity	1.11
Flash point	See MSDS

Typical Properties (Cured)

Property	Value
Coefficient of thermal expansion, ASTM D696 (K ⁻¹)	80 x 10 ⁻⁶
Coefficient of thermal conductivity, ASTM C 177, W/(m·K)	0.1
Temperature Range, °F	-65 to 300

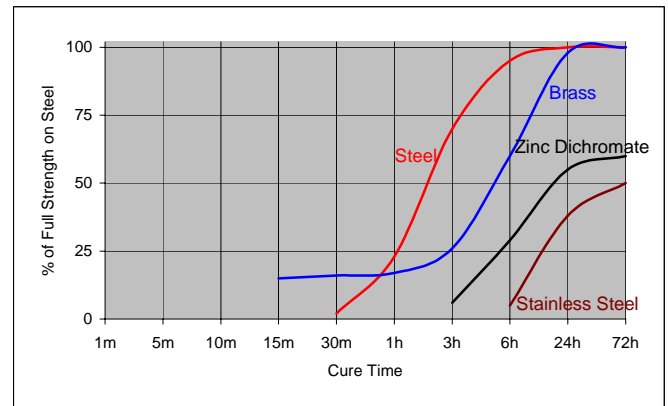
Performance Testing

Each batch of **Nuts N' Bolts[®] 429** is tested to the lot requirements of MIL-S-46163A (Type I Grade L), and to the detail requirements of ASTM D5363 (AN0211).

Typical Curing Performance

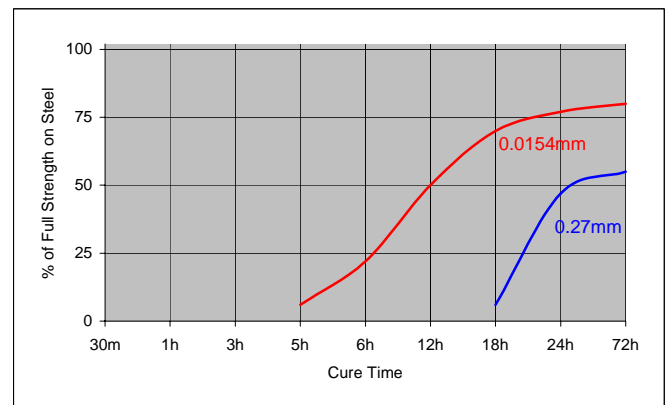
Cure Speed vs. Substrate

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



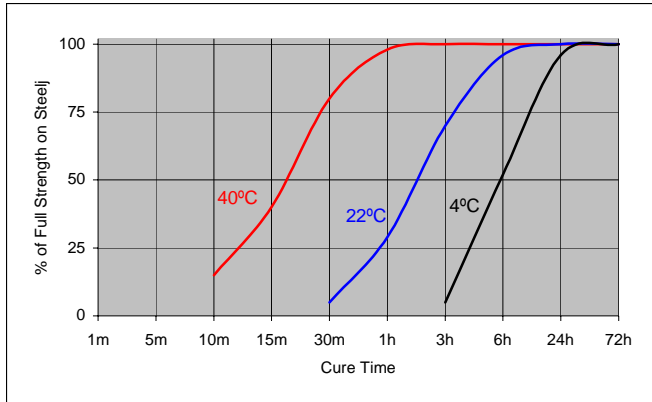
Cure Speed vs. Bond Gap

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 ambient temperature. The graph shows the breakaway strength developed with time at different temperatures on M10 steel nuts and bolts and tested according to ISO 0964.

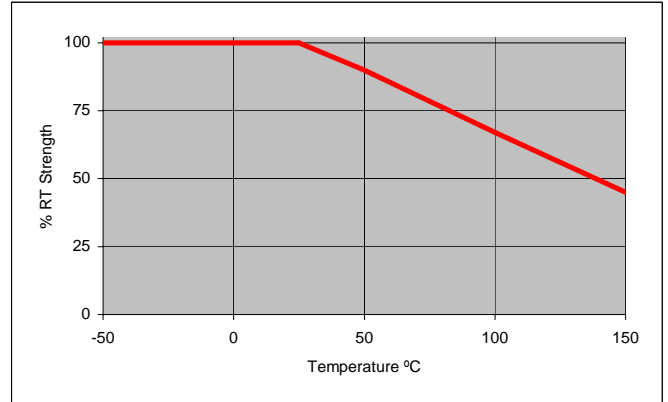


Typical Environmental Resistance

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

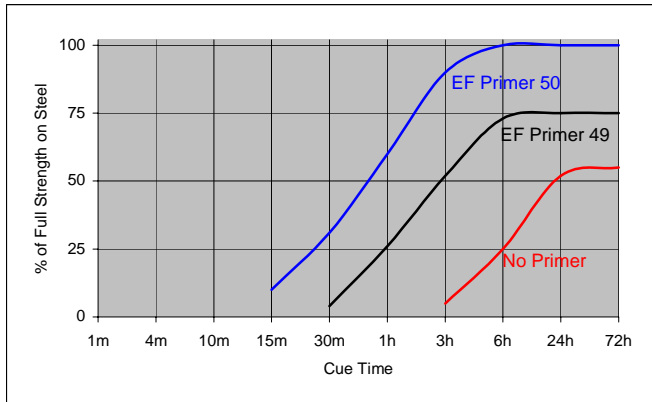
Hot Strength

Tested at temperature



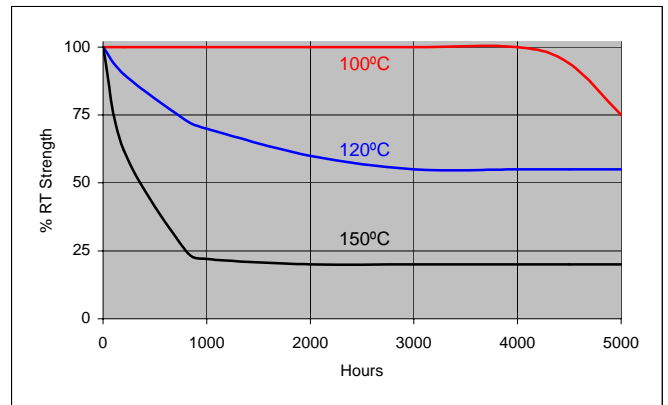
Cure Speed vs. Primer

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.



Heat Aging

Aged at temperature indicated and tested at 22°C



Typical Cured Performance

Tested on M10 steel nuts and bolts according to ISO 10964.

RT Cure	Torque	N•m (in-lb)
24 Hours	Breakaway	31.6 (280)
	Prevailing	31.6 (280)
	Breakloose Pretorqued to 5 N•m (45 in-lbs)	38.4 (340)
	Maximum Prevailing Pretorqued to 5 N•m (45 in-lbs)	39.5 (350)

Chemical/Solvent Resistance

Aged under conditions indicated and tested at 22°C.

Chemical/Solvent	Temp (°C)	% of Initial Strength		
		100 h	500 h	1000 h
Water Glycol 50/50	87	90	90	90
Brake fluid	22	100	100	100
Ethanol	22	95	95	95
Gasoline	22	100	100	100
Acetone	22	95	95	95
Motor Oil	125	100	100	100
NaOH, 10%	22	100	100	70
HCl, 10%	22	100	100	100

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® 429** 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® 429 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 ISO9001:2000 Quality Standard.