

## Technical Data Sheet Nuts N' Bolts® 428

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### Product Description

**Hernon® Nuts N' Bolts® 428** is a single component anaerobic threadlocking compound designed for heavy duty applications subject to operating temperatures to 450°F (232°C).

The product delivers high strength locking and sealing on screws, nuts, bolts, studs and fittings. Excellent breakloose and prevailing torque values assure maximized resistance to transverse vibration loosening at elevated temperatures.

### Typical Applications

- Heat treat furnace equipment.
- Annealing equipment.
- Rolling mill components, conveyances.
- Hot forge, induction heating equipment.

### Typical Properties (Uncured)

Property	Value
Chemical Type	Dimethacrylate ester
Appearance	Red fluorescent liquid
Viscosity @ 77°F (25°C), cP	4000 to 8000
Specific gravity	1.15
Flash point	See MSDS
Temperature Range, °F	-65 to 300

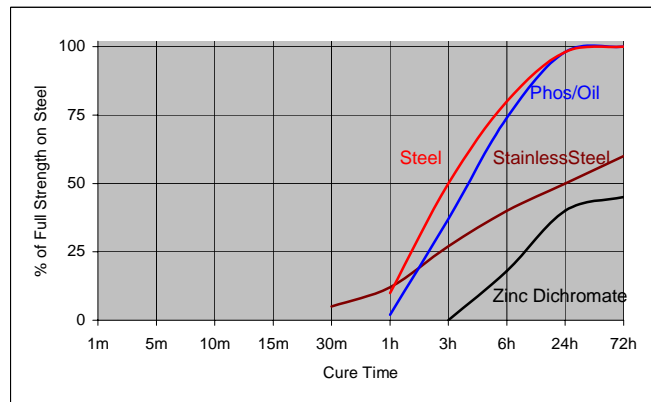
### Typical Properties (Cured)

Property	Value
Coefficient of thermal expansion, ASTM D696 (K <sup>-1</sup> )	80 x 10 <sup>-6</sup>
Coefficient of thermal conductivity, ASTM C 177, W/(m·K)	0.1
Temperature Range, °F	-65 to 450

### Typical Curing Performance

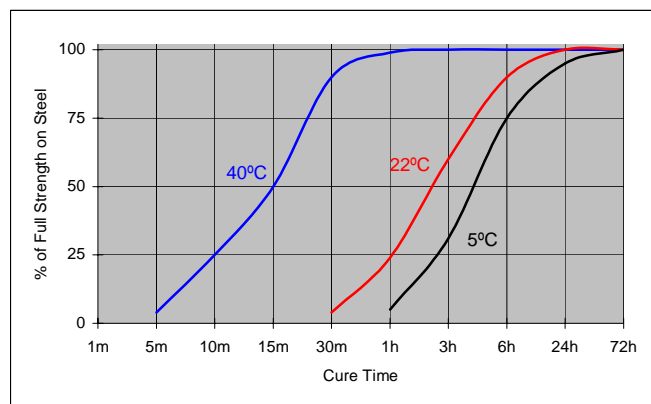
#### Cure Speed vs. Substrate

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.



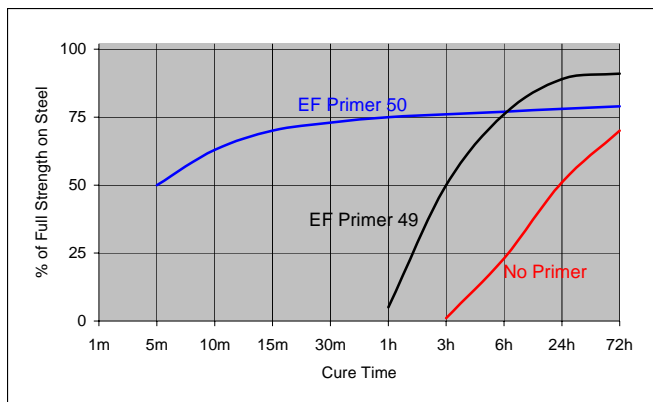
#### Cure Speed vs. Temperature

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.



#### 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

#### Torque Strength

Cured 24 hours at 22°C

Steel nuts and bolts, ISO 10964

Torque	Specimen Size	N•m (in-lb)
Breakaway	M10	23 (200)
Prevailing	M10	25 (220)
Breakaway	3/8 x 16	≥ 18 (≥ 159)
Prevailing	3/8 x 16	≥ 18 (≥ 159)

#### Shear Strength

Steel pins and collars

ISO 10123

Cure	N/mm² (psi)
24 hours at 22°C	≥ 14.5 (≥ 2102)
72 hours at 200°C, tested at 200°C	≥ 20.0 (≥ 2900)

### Typical Environmental Resistance

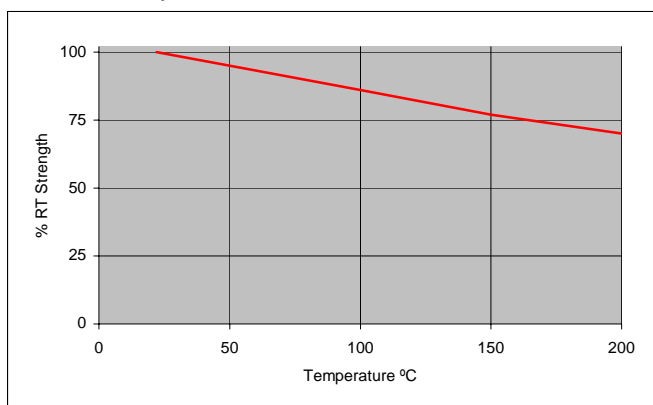
Cured for 24 hours @ 22°C

Breakaway Torque, ISO 10964

M10 steel nuts and bolts

#### Hot Strength

Tested at temperature



### Chemical/Solvent Resistance

Aged 720 hours under conditions indicated and tested at 22°C.

Chemical/Solvent	Temp, °C	% of Initial Strength
Air Reference	87	100
Motor Oil	87	62
Gasoline	87	62
Water	87	58
Isopropanol	87	87
Toluene	87	80
Phosphate Ester	87	70

### 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® 428** 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® 428** 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.