

## Nuts N' Bolts<sup>®</sup> 431

### Description

**Hernon<sup>®</sup> Nuts N' Bolts<sup>®</sup> 431** is a wicking anaerobic used for preassembled equipment and structures where penetration into fastener connection points is required. This product allows very simple preventive maintenance by permitting thread locking without dismantling equipment. The product "wicks" into voids by capillary action. Use **Nuts N' Bolts<sup>®</sup> 431** to seal pores or pinhole porosity in welded seams, tanks, castings, or metal parts. The cured adhesive is a thermoset plastic suitable for temperatures up to 400°F (204°C), and exposure to most solvents.

### Product Benefits

- Prevents loosening of threaded parts
- Prevents rusting of threads
- Seals against leakage
- Cures without cracking or shrinking
- Easily applied with **Hernon<sup>®</sup>** application equipment
- Low inventory-fits wide range of bolt sizes
- Single component-no mixing
- No curing outside of joint
- Can be applied after assembly

### Typical Applications

- Air compressor fasteners
- Refrigeration safety valves, compressor coils
- Emission control valve screws
- Fasteners on equipment for shipment
- Calibration & adjustment screws
- Tamper proofing assemblies
- Bicycles, motorcycles
- Children's swings, toys
- Gun smiting

### Performance Testing

Each batch of **Nuts N' Bolts<sup>®</sup> 431** is tested to the lot requirements of MIL-S-46163A (Type III Grade R), and to the detail requirements of ASTM D5363 (AN0261).

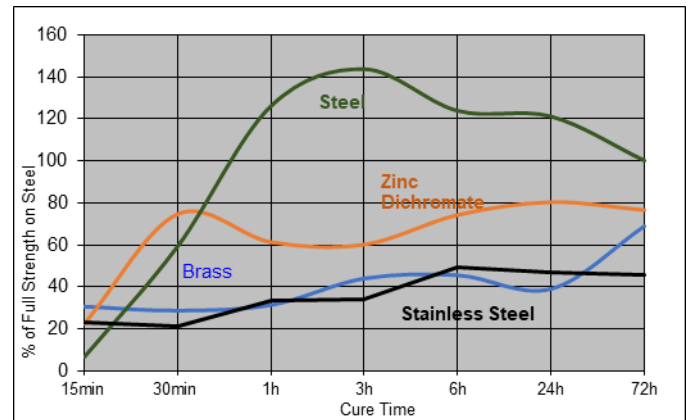
### Typical Properties (Uncured)

Property	Value
Chemical Type	Methacrylate Ester
Appearance	Green fluorescent liquid
Specific Gravity	1.06
Viscosity @ 25°C, cP	10-30
Flash Point	See SDS

### 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 on M10 steel nuts and bolts compared to different materials and tested according to ISO 10964.



### Typical Properties (Cured)

Property	Value
Coefficient of thermal conductivity, ASTM C177, W / m <sup>2</sup> K	0.5
Temperature Range, °F	-65 to 400
Gap Filling	0.001 in. – 0.004 in.
Set Time, by using 3/8 x 16 grade 5 steel bolts and type 2 nuts	≤ 5 min
Set Time, by using 3/8 x 16 stainless steel bolts and nuts	≤ 10 min

### Typical Cured Performance

Cured and tested at 22°C on 3/8 x 16 grade 5 bolts and type 2 nuts according to ASTM D5363.

# Hernon® Technical Data Sheet

## Nuts N' Bolts® 426G

Cure	Substrate	Torque	N <sub>em</sub> (in-lb)
15 Minutes	Steel	Breakaway	≥1.1 (10)
		Prevailing	≥8.5 (75)
24 Hours	Steel	Breakaway	2.3 to 16.9 (20 to 150)
		Prevailing	17.0 to 56.5 (150 to 500)
	Plated	Breakaway	1.1 to 11.3 (10 to 100)
		Prevailing	8.5 to 56.5 (75 to 500)

### Shear Strength

Tested on steel pins and collars according to ISO 10123

RT Cure	N/mm <sup>2</sup> (psi)
24 Hours	≥ 13.8 (≥ 2000)

### Qualification of Primer

Torque Strength, ASTM D5363

3/8 x 16 grade 5 bolts and type 2 nuts

Cure Time at 22°C with **Hernon® Primer 50** (Grade N)

Prevailing Torque N <sub>em</sub> (in-lb)	
Plated Steel	
6 Hours	5 to 30 (44 to 265)
24 Hours	8.5 to 56.5 (75 to 500)

### Typical Environmental Resistance

#### Hot Strength

Cured for 24 hours at standard conditions,

Heated to 150°C for 2 hours,

3/8 x 16 grade 5 bolts and type 2 nuts

Tested hot according to ASTM D5363

Substrate	Torque	N <sub>em</sub> (in-lb)
Steel	Breakaway	≥1.1 (10)
	Prevailing	≥8.5 (75)

#### Heat Aging

Cured for 24 hours at standard conditions.

Aged for 1000 hours at temperature and tested at room temperature, according to ASTM D5363

3/8 x 16 grade 5 bolts and type 2 nuts

Substrate	Temperature	Torque	N <sub>em</sub> (in-lb)
Steel	150°C	Breakaway	≥1.1 (10)
		Prevailing	≥8.5 (75)

#### Chemical/Solvent Resistance

Cured for 1 week at 22 °C,

Aged for 1000 hours under the conditions indicated and tested at 22 °C,

Breakloose Torque, ISO 10964:

M10 Zinc phosphate steel Nuts and Bolts

Chemical/Solvent	Temp (°C)	% of Initial Strength
Motor Oil	125	>100
Water:Glycol (50:50)	87	>100
Ethanol	22	>100
Acetone	22	>100
Brake Fluid	22	>100
Gasoline	22	>100
DEF	22	>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 Safety Data Sheet (SDS).**

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 case, 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® 431** 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® 431** should be stored in a cool, dry location in unopened containers at a temperature between 45°F to 85°F (7°C to 29°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.

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### 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.