HERNON®
High Performance Adhesives and Sealants
ISO 9001 Registered

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Technical Data Sheet
Nuts N' Bolts® 232

Product Description

Hernon® Nuts N' Bolts® 232 is a single component medium strength, anaerobic compound used to lock and seal fine threaded nuts, bolts and studs in a wide variety of applications where removal with ordinary hand tools is necessary.

Product Benefits

- Single component (no mixing)
- Predictable and reliable performance
- Reduces inventory
- No shrinkage or cracking due to solvent evaporation

Typical Applications

- Replaces the fastener locking device of all kinds
- Thread sealer
- Locking adjustment screw

Performance Testing

Each batch of **Nuts N' Bolts® 232** is tested to the detailed requirements of ASTM D5363 (AN0141) which replaced MIL-S-22473E (Grade C) specifications.

Typical Properties (Uncured)

Property	Value
Chemical Type	Dimethacrylate Ester
Appearance	Blue Liquid
Viscosity @ 25ºC, cP	10 -25
Specific Gravity	1.16
Flash Point	See SDS
Fluorescence	Positive

Typical Properties (Cured)

Property	Value
Temperature Range, ºC (ºF)	-55 to 150 (-65 to 300)
Coefficient of thermal conductivity, ASTM C 177, W/(m·K)	0.38
Gap Filling	Max. 0.004 in.

Typical Performance Properties

Torque Strength, ASTM D5363
3/8 x 24 Grade 2 Steel Nuts and Bolts

Cure Time at 22ºC	Breakaway Torque N•m (in-lb)	Prevailing Torque N•m (in-lb)
6 Hours	---	≥ 2.3 (20)
24 Hours	≥ 5.6 (50)	4.5 to 11.3 (40-100)

Qualification of Primers
Torque Strength, ASTM D5363
3/8 x 24 Grade 2 Steel Nuts and Bolts
Cure Time at 22ºC with Primer 49 (Grade T)

Prevailing Torque N•m (in-lb)		Prevailing Torque N•m (in-lb)	
Steel		Plated	
10 min	≥ 2.3 (20)	30 min	≥ 2.3 (20)
40 min	4.5 to 11.3 (40-100)	2 Hours	4.5 to 11.3 (40-100)

Cure Time at 22ºC with Primer 50 (Grade N)

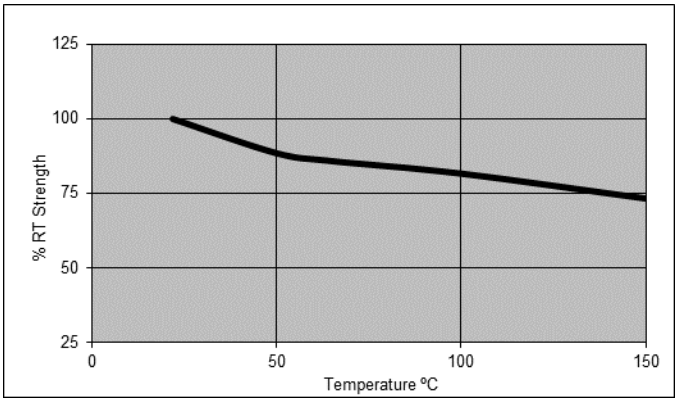
Prevailing Torque N•m (in-lb)	
Plated	
6 Hours	≥ 2.3 (20)
24 Hours	4.5 to 11.3 (40-100)

Typical Environmental Resistance

A. Hot Strength
Cured 24 hours at standard conditions,
Prevailing Torque, ASTM D5363:
3/8 x 24 Grade 2 Steel Nuts and Bolts
Heated in an air-circulated oven for 120 min at temperature given below.

Prevailing Torque N•m (in-lb)	
Steel	
150ºC	≥ 2.7 (23)

Cured 72 hours at standard conditions,
Breakaway Torque, ISO 10964,
3/8 x 24 Grade 2 Steel Nuts and Bolts
Tested at temperature



B. Heat Aging
Aged at temperature for 1000 hours and tested at room temperature.

Prevailing Torque N•m (in-lb)	
Steel	
150ºC	≥ 2.3 (20)

C. Chemical/Solvent Resistance
Cured for 72 hours at 22 ºC,
Aged for 300 hours under the conditions indicated and tested at 22 ºC,
Breakaway Torque, ISO 10964:
3/8 x 24 Grade 2 Steel Nuts and Bolts

Chemical/Solvent	Temp (ºC)	% of Initial Strength
Hydraulic Fluid	93	105
Water	93	100
Ethylene Glycol	93	83
Ethanol	22	106
Acetone	22	121

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 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). Users are recommended to confirm compatibility of the product with such substrates. Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

Directions for use
For Assembly
1. For best results, clean all surfaces (external and internal) with **Hernon® Cleaning Solvent 62** and allow to dry.
2. If the material is an inactive metal or the cure speed is too slow, spray all threads with **Primer 49 or 50** and allow to dry.
3. Shake the product thoroughly before use.
4. To prevent the product from clogging in the nozzle, do not allow the tip to touch metal surfaces during application.
5. **For Thru Holes**, apply several drops of the product onto the bolt at the nut engagement area.
6. **For Blind** Holes, apply several drops of the product down the internal threads to the bottom of the hole.
7. **For Sealing Applications**, apply a 360º bead of product to the leading threads of the male fitting, leaving the first thread free. Force the material into the threads to thoroughly fill the voids. For bigger threads and voids, adjust product amount accordingly and apply a 360º bead of product on the female threads also.
8. Assemble and tighten as required.

For Disassembly
1. Remove with standard hand tools.
2. In rare instances where hand tools do not work because of excessive engagement length, apply localized heat to nut or bolt to approximately 250ºC. Disassemble while hot.
3. Once disassembled, cured adhesive can be removed with **Hernon® Gasket Remover 30** by following instructions. A solvent wipe with an organic or petroleum solvent will remove uncured adhesive outside the joint.

For Cleanup
Cured product can be removed with a combination of soaking in **Hernon® Cleaning Solvent 62** and mechanical abrasion such as a wire brush.

Storage
Nuts N' Bolts® 232 should be stored in a cool, dry location in unopened containers at a temperature between 45ºF to 85ºF (7ºC to 29ºC) 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.