Technical Overview
Nylok | Marmon | Berkshire Hathaway

- # 3 Fortune 500 List
  - Financially Stable
- Aggressive Investment Strategy
  - Seeking Growth Partners
- Decentralized Culture
  - Close to Customer

- Warren Buffett
  Chairman and CEO Berkshire Hathaway
Global Support Network

Nylok Facilities
Licensees

North America | South America | Europe | Asia
Who We Are & The Role We Play

• *First* and *largest* fully dedicated processor of self locking products in the world

• Proven history of solving customer fastener issues for over 75 years

**Mission & Vision:**

> Developing Innovative Fastening Solutions Globally by Engineering Processes and Formulating Products
Segmentation – Nylok Is Everywhere

- Automotive
- Aerospace & Defense
- Rail
- Industrial
- Heavy Truck
- Electronics
Product Overview

- **LOCKING**
  - Mechanical Reusable

- **SEALING**
  - NySeal® 2.0
  - The King of Under Hood Sealants
  - NEW Reusable

- **ASSEMBLY AIDS**
  - NEW

- **PROTECTION**
  - NEW

A Marmon/Berkshire Hathaway Company
Locking: Mechanical vs. Chemical

Mechanical – Reusable

Chemical 1XUse

3M

Chemical 1XUse

Precote

M10 EXAMPLE AVERAGE TORQUE (NM)

<table>
<thead>
<tr>
<th></th>
<th>Chemical Locking</th>
<th>Mechanical Locking</th>
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<tbody>
<tr>
<td>ON</td>
<td>1.4</td>
<td>7.5</td>
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<td>BREAKAWAY</td>
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<td>FIRST PREVAILING OFF</td>
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<td>6</td>
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<td>FIFTH PREVAILING OFF</td>
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TEMPERATURE C°

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<tr>
<th>Material</th>
<th>Precote 80</th>
<th>Precote 30</th>
<th>Patch, Pellet, Strip</th>
<th>NyTemp</th>
<th>Scotchgrip Yellow/Blue</th>
<th>Scotchgrip Orange</th>
<th>Precote 85</th>
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<tr>
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<td>232</td>
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<td>149</td>
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Mechanical Locking (Reusable)

Torq-Patch®  Nytemp®  NylokHD™  Pellet / Strip

*Available for internal and external threads
Mechanical Locking (Reusable / Adjustable)

*Nylon Torq-Patch® Tuflok®*
- Decrease clearance / Increase friction / Provide Prevailing Torque
  - Prevent vibration and loosening
- Also provides thread sealing
- Coverage: 180° or 360°
- Immediate locking (No waiting for chemical reaction)
- Infinite shelf life
- Temperature Range:
  - -56° C (-70° F) to 121° C (250° F)
- Specifications:
  - IFI: 100/107 (nut), 124 (Inch), 524 (Metric)
  - DIN: 267 Part 28
  - Military: MIL - DTL - 18240F, NASM15981
  - OEM: See website
Mechanical Locking (Reusable / Adjustable)

**Nytemp® - High Temperature Patch**
- Decrease clearance / Increase friction
  - Prevent vibration and loosening
- Passes outgassing requirements
- Temperature Range:
  - -50°C (-70°F) to +232°C (+450°F)
- Specifications:
  - IFI: – 124 (Inch)/524 (Metric) 100/107 (nut), 155, 555
  - MIL - DTL - 18240F (Military), NASM25027
  - NASA SP – R – 0022A
  - ANSI B.18.16.1M
  - AMS3670
  - OEM: See website
Mechanical Locking (Reusable / Adjustable)

**NylokHD® TuflokHD®**

- Best in class reusability
- Reduces installation torque scatter
- Temperature Range:
  - -56°C (-70°F) to 121°C (250°F)
- Specifications:
  - IFI – 100/107
  - NASM25027 (Military)
Mechanical Locking (Reusable)

**Blue Nylon Pellet & Strip**
- Decrease clearance / Increase friction
- Prevent vibration and loosening
- Temperature Range:
  - Nylon (Standard): -70°F to 250°F (-56°C to 121°C)
  - Kel-F® (High Temp): -320°F to 350°F (-195°C to 177°C)
  - Teflon® (High Temp): -90°F to 550°F (-68°C to 288°C)
  - Vespel® (High Temp): -320°F to 700°F (-195°C to 371°C)
- Specifications:
  - IFI: 124 (Inch), 524 (Metric), 100/107 (nut), 155, 555
  - MIL - DTL - 18240F (Military)
  - OEM: See website
Chemical Locking (1 Time Use)

30, 80, 85

*Available for internal and external threads

3M Scotchgrip
2353, 2510
Chemical Locking (1 Time Use)

**Precote® 30, 80 & 85**
- Microencapsulated Adhesive Chemistry
- 360 degree coverage
- 4 year shelf life
- Seals (400 bar/5760 PSI)
- Removable w/o heat
- Temperature Range:
  - 30: -60°C (-76°F) to +150°C (+302°F)
  - 80: -60°C (-76°F) to +170°C (+338°F)
  - 85: -50°C (-58°F) to +170°C (+338°F)
- Specifications:
  - IFI – 125 (Inch) / 525 (Metric)
  - DIN 267 Part 27
  - OEM: See website
Chemical Locking (1 Time Use)

**3M™ 2353 & 2510**
- Microencapsulated Adhesive Chemistry
- Seals
- Removable without heat
- 1 year shelf life
- Temperature Range:
  - 2353: -50° C to 116° C
  - 2510: -50° C to 149° C
- Specifications:
  - IFI – 125 (Inch) / 525 (Metric)
  - DIN 267 Part 27
Sealing

NySeal® 2.0
Nyseal®
Nyplas®
precote® 200
precote® 5
3M Thread
Sealant 4291
Sealing (Reusable)

Nyseal® 2.0

- Eliminates leak paths and prevents leakage of fluids and gases up to 500 psi (3447kPa)
  - Eliminates O – rings, gaskets and sealant compounds
  - Reusable
- Resistant to most chemicals
- Does not break down mating acrylics surfaces (like plastisol) and therefore prevents fogging of lens
- Often used for LED lighting
- Prevents Galvanic Corrosion
- Temperature Range:
  - -40°C (-40°F) to +66°C (+150°F)
- Specifications
  - Ford WSS-M21P2]7-A5
Sealing

*Nyseal®*

- Eliminates leak paths and prevents leakage of fluids and gases up to 500 psi (3447kPa)
  - Eliminates O – rings, gaskets and sealant compounds
  - Reusable
- Resistant to most chemicals
- Does not break down mating acrylics surfaces (like plastisol) and therefore prevents fogging of lens
- Often used for LED lighting
- Prevents Galvanic Corrosion
- Temperature Range:
  - -40°C (-40°F) to +66°C (+150°F)
- Specifications
  - Ford WSS-M21P2]7-A5
Sealing

**Nyplas®**

- Provides sealing against water, moisture, dust, air and noise dampening
- Temperature Range:
  - -40°C (-40°F) to +150°C to (+300°F)
- Specifications:
  - OEM: See website
Sealing

**Precote® 200**

- Seals against oil, automotive fluids, water, dust, moisture and prevents galvanic corrosion
- Does not break down mating acrylics surfaces preventing fogging of lens
- Often used for LED lighting
- Temperature Range:
  - -40°C (-40°F) to +100°C (+212°F)
- Specifications:
  - Ford WSS-M4G35-A/A2
Sealing

**Precote® 5**

- Seals threads and prevents leakage
- Used in many cases to replace Teflon tape
- Pre-applied with consistent coverage in proper location
- Reduces labor and improves quality
- Temperature Range:
  - -60°C (-75°F) to 160°C (320°F)
- Specifications:
  - OEM: See website
Sealing

3M™ Thread Sealant 4291

• Seals threads paths preventing any leakage
• Used in many cases to replace Teflon tape
• Pre-applied with consistent coverage in proper location
• Reduces labor and improves quality
• Temperature Range:
  • -56°C (-70°F) to 149°C (300°F)
Safety / Protection

- Nystay®
- Nycote® Plus & Nycote®
- Nytorq®
- Nyplate®
Safety (Assembly Ergonomics)

*Nystay®*

- Fastener retention solution allowing the fastener to be held in place during production and transport without affecting the end assembly
- Temperature Range:
  - -40°C (-40°F) to +66°C (+150°F)
- Specifications:
  - GM – GMW3666
Safety / Protection

*Nycote® Plus (Nycote®)*

• Thread masking prevents weld spatter, electro-deposited primers or coating from adhering to the threads
• Eliminates manual plug/inserts & re-tapping rework
• Specifications:
  • OEM: See website
Safety (Ergonomics)

Nytorq®
- Pre-applied thread lubricant
  - Reduces friction and prevents cold welding
- Temperature Range:
  - -70°C (-94°F) to +120°C (+248°F)
- Specifications:
  - OEM: See website
Safety / Protection

Nyplate®

- Pre-applied thread anti-seize
  - Accommodates high rundown on assembly without:
    - Galling
    - Torque chattering
    - Cold welding
- Stainless steel applications
- Temperature Range:
  - -60°C (-76°F) to +850°C (+1562°F)
Galvanic Corrosion Prevention – NyShield®

CORROSION TEST RESULTS

STEEL FASTENERS ON CARBON FIBER - 15 YEAR SIMULATION

CONTROL – GMW3359
TESTED PER GMW17026

NYSHIELD™ – ZINC FINISH
TESTED PER GMW17026

STEEL FASTENERS ON MAGNESIUM - 15 YEAR SIMULATION

CONTROL – GMW3359
TESTED PER GMW17026

NYSHIELD™ – ZINC FINISH
TESTED PER GMW17026

*Also prevents short circuits by providing di-electric barrier
Additional Resources

• Questions sales@nylok.com
• Download 101 presentation @ nylok.com
• Schedule Nylok Training
  • 201 – Technical Lunch & Learn
  • 301 – “How it’s Made” Facility Tour
  • 401 – Bottleneck Hunting (OEM Line Walks)
  • 501 – Blueprinting “Wouldn’t it be nice if”