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# Technical Data Sheet

# Penetrating Grade Threadlocker GREEN

INDUSTRIAL

**PRODUCT DESCRIPTION** **S.I.N.: 834-300**

Permatex® Penetrating Grade Threadlocker GREEN is a **medium strength** anaerobic threadlocking material, which cures between engaged threads to form a unitized assembly that helps resist leakage, shock and vibration. The product is a single component, anaerobic liquid that cures in the absence of air and when confined between close fitting metal surfaces. Because of its low viscosity and capillary action, the product *wicks* between engaged threads and eliminates the need to disassemble, apply product and then reassemble. The high prevailing torque provides vibration resistance to adjustment screws. Ideal for all threaded engagements less than or equal to 1/2 inch in diameter. The product can also fill porosity in welds, castings and powder metal parts. Excellent chemical resistance and temperature range of -54°C to +149°C (-65°F to +300°F). Meets or exceeds the requirements of Military Specification Mil-S-46163A Type II, Grade R. NSF White Book registered.

**PRODUCT BENEFITS**

**Improved Reliability**

- Eliminates vibration issues
- Seals against leakage
- Prevents rusting of threads
- Cures without cracking or shrinking
- Can be adjusted or disassembled
- Seals porosity

**Easy Application**

- No mixing
- No disassembly
- No curing outside of joint

**TYPICAL APPLICATIONS**

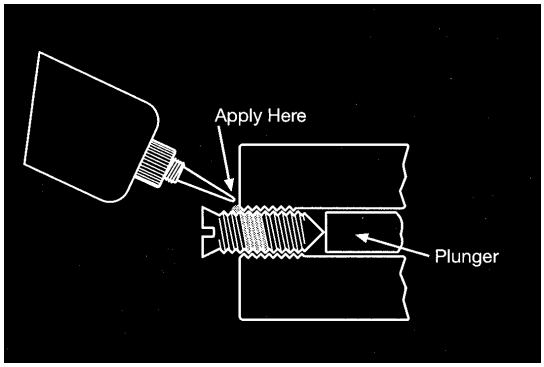
Prevents loosening and leakage of pre-assembled threaded fasteners and as a porosity sealant. Particularly suitable for applications such as:

- Pre-assembled fasteners
- Adjustment screws
- Seal porous welds
- Seal porosity on brake unit housings
- Seal brazed joints in cooling systems

**DIRECTIONS FOR USE**

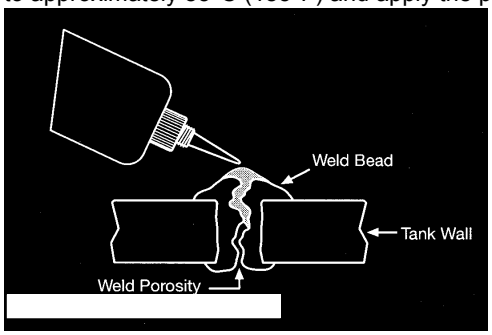
**For Pre-assembled Threaded Parts with Thru Hole**

1. Prior to assembly, clean all threads (Bolt and Hole) with a cleaning solvent such as Permatex® Brake and Parts Cleaner and allow to dry.
2. **For Thru Holes**, apply several drops of product at screw and body juncture as shown:




Avoid touching the bottle tip to the metal surface.
Not recommended for pre-assembled threads in a blind hole.

3. **For Porosity Sealing**, clean area and apply localized heat to the area to approximately 121°C (250°F). Allow to cool to approximately 85°C (185°F) and apply the product.




Maximum porosity sealed: .005".

**For Cleanup**

1. Residual liquid films and/or fillets outside the joint are readily soluble in Permatex® Brake and Parts Cleaner.
2. Cured product can be removed with a combination of soaking in Permatex® Gasket Remover and mechanical abrasion such as a wire brush.

**For Disassembly**

1. Remove with standard hand tools.
2. In the rare instance where hand tools do not work, because of excessive engagement length, apply localized heat to nut or bolt to approximately 232°C (450°F). Disassemble while hot.

**For Reassembly**

1. Remove loose product from nut and bolt.
2. Apply primer to all threads, regardless of metal type.
3. Assemble and tighten as usual.

## PROPERTIES OF UNCURED MATERIAL

| | Typical Value |
|---|---|
| Chemical Type | Anaerobic Dimethacrylate Ester |
| Appearance | Green Fluorescent Liquid |
| Specific Gravity | 1.08 |
| Viscosity @ 25°C, mPa.s (cP) | 9 to 16 |
| Brookfield RVF, spindle #3, Helipath @ 20 RPM | |
| Flash Point (TCC), °C (°F) | >93 (>200) |

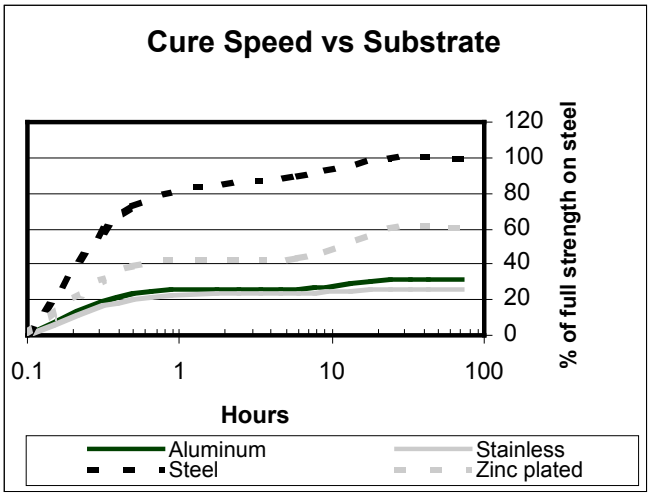
## TYPICAL CURING PERFORMANCE

**Cure speed vs. substrate**

The rate of cure will depend on the material used. Permatex® Penetrating Grade Threadlocker GREEN will react faster and stronger with **Active Metals.** However, **Inactive Metals** will require the use of an activator (Surface Prep) to obtain maximum strength and cure speed at room temperature.

| Active Metals | Inactive Metals |
|---|---|
| Soft Steel Iron | Bright Platings |
| Copper | Anodized Surfaces |
| Brass | Titanium |
| Manganese | Zinc |
| Bronze | Pure Aluminum |
| Nickel | Stainless Steel |
| Aluminum Alloy | Cadmium |

The graph below shows the breakaway strength developed with time on 3/8" - 16 Grade 5 bolts and Grade 8 nuts compared to different materials.

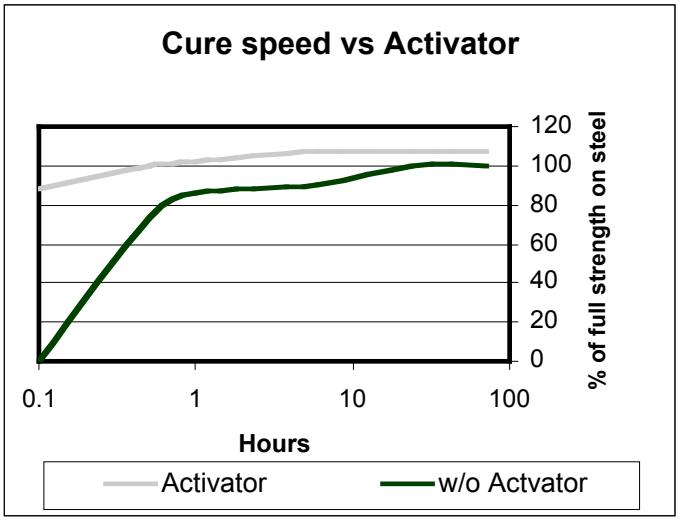



**Cure speed vs. temperature**

The rate of cure will depend on the ambient temperature. **Full cure** is attainable in 24 hours at room temperature, 22°C (72°F), or 1 hour at 93°C (200°F).

**Cure speed vs. activator**

Where cure speed is unacceptably long, or large gaps are present, applying an activator (Surface Prep) to the surface will improve cure speed. A 3/8-16 steel nut and bolt assembly will fixture in 3 minutes using an activator, while fixturing will occur in 20 minutes without an activator. Full cure in 24 hours for both procedures. The graph below shows the breakaway strength developed with time using Permatex® Surface Prep Activator.




## PERFORMANCE OF CURED MATERIAL

(After 24 hr at 72°F on 3/8-16 steel Grade 8 Nuts and Grade 5 bolts)

| | Typical Value | Range |
|---|---|---|
| Breakaway Torque, Nm, | 10 | 3 to 17 |
| (in.lbs) | (85) | (20 to 150) |
| Prevail Torque, Nm | 29 | 17 to 41 |
| (in.lbs) | (250) | (150 to 350) |

Where Breakaway Torque is the force required to initiate the fastener movement and Prevail Torque is the force required to disassemble the fastener once Breakaway Torque has occurred.

## TYPICAL ENVIRONMENTAL RESISTANCE

**Temperature Resistance**

Product temperature range from -54°C to +149°C (-65°F to +300°F). The breakaway and prevailing torque values decrease as temperature increases, however the assembly remains effective against vibration and leakage.

**Chemical / Solvent Resistance**

Aged under conditions and tested at 22°C(72°F)

% Initial Strength retained after time

| | Temp | 500hr | 1000hr |
|---|---|---|---|
| Hot air | 150°C | | 35% |
| Motor oil(SL) | 125°C | | 60% |
| Gasoline | 23°C | 100% | |
| Antifreeze | 87°C | 100% | |
| Ethanol | 23°C | 100% | |
| Acetone | 23°C | 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).**

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.

**Ordering Information**

| Part Number | Container Size |
|---|---|
| 29010 | 10 ml bottle, carded |
| 29050 | 50 ml bottle |
| 29025 | 250 ml bottle |

**STORAGE**

Products shall be ideally stored in a cool, dry location in unopened containers at a temperature between 8° to 28°C (46° to 82°F) unless otherwise labeled. Optimal storage is at the lower half of this temperature range. To prevent contamination of unused product, do not return any material to its original container.

**NOTE**

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