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## Technical Data Sheet

# High Strength Removable Threadlocker ORANGE

Revised 03/19

### PRODUCT DESCRIPTION

Permatex® High Strength Removable Threadlocker Orange is a **high strength** anaerobic threadlocking material. This hybrid formula combines the strength of Permatex® Red Threadlocker with the removability of Permatex® Blue Threadlocker. The product is a single component, anaerobic liquid that cures to form a unitized assembly when confined in the absence of air between close fitting metal surfaces. Ideal for high vibration applications, engine bays, and assemblies where high strength is needed while future disassembly is probable. Easily removable with hand tools for servicing requirements. Excellent chemical resistance and temperature resistance range of -54°C to +149°C (-65°F to +300°F). Meets or exceeds the requirements of ASTM D5363 AN0331 (Mil-S-46163A Type II, Grade O).

### PRODUCT BENEFITS

#### Improved Reliability

- High strength, yet removable with hand tools
- Eliminates vibration issues
- Seals against leakage
- Prevents rusting of threads
- Cures without cracking or shrinking
- Can be adjusted or disassembled

#### Easy Application

- No mixing
- No curing outside of joint
- Thixotropic: resists dripping from threads during assembly
- No torque compensation required during assembly

### TYPICAL APPLICATIONS

Prevents loosening and leakage of threaded fasteners. Particularly suitable for applications such as:

- Construction equipment
- Manufacturing machinery
- Motorsports vehicles
- Axle nuts
- Starter bolts
- Power tools
- Lawn and garden equipment
- Flywheel bolts
- Triple tree fasteners
- Case half bolts

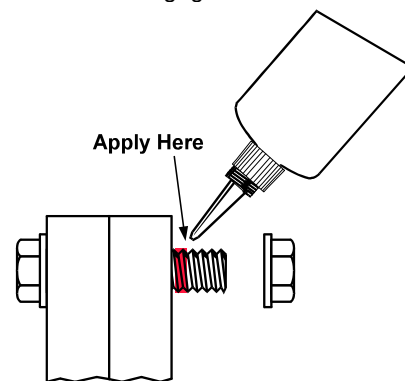
### DIRECTIONS FOR USE

#### For assembly

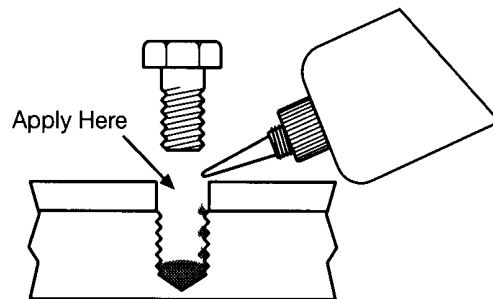
1. Clean all threads (Bolt and Hole) with a cleaning solvent such as Permatex® Brake and Parts Cleaner and allow to dry.
2. Determine if the threads to be bonded are **Active** or **Inactive Metals** (Ref: Cure Speed vs. Substrate on the

second page). If material is an **Inactive Metal**, spray all threads with Permatex® Surface Prep and allow 30 seconds to dry. Priming is not required if the material is an **Active Metal**. If unknown, it's always best to use the primer.

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 product onto the bolt at the nut engagement area.



6. **For Blind Holes**, apply several drops down female threads into the bottom of the hole. As threads are engaged, compressed air forces the product upwards into the threads.



7. Assemble and tighten as usual. When tightening to established torque values, torque compensation is not required.

#### 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.

NOT FOR PRODUCT SPECIFICATIONS.

THE TECHNICAL DATA CONTAINED HEREIN ARE INTENDED AS REFERENCE ONLY.

PLEASE CONTACT PERMATEX, INC., TECHNICAL SERVICE DEPARTMENT FOR ASSISTANCE AND RECOMMENDATIONS FOR YOUR SPECIFIC APPLICATION.  
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**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	Opaque Yellow-Red Liquid
Specific Gravity	1.10
Viscosity @ 25°C, mPa.s (cP)	1200-2400
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® High Strength Removable Threadlocker ORANGE 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).

**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, (in.lb)	18 (160)	17 to 23 (150 to 200)
Prevail Torque, Nm (in.lb)	20 (180)	19 to 28 (175 to 250)

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		56%
Motor oil(SL)	125°C		51%
Gasoline	23°C	93%	
Antifreeze	87°C	82%	
Ethanol	23°C	96%	
Acetone	23°C	99%	

**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
25210	10 ml bottle, carded

**STORAGE**

Products shall be ideally stored in a cool, dry location in unopened containers at a temperature between 8° and 28°C (46° and 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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