

PERMABOND[®] MM185 PURE[™]



***NSF 61 Approved
Anaerobic Retaining Compound***

Ref. #: 010104PBMM185P

FEATURES & BENEFITS

NSF certified drinking water system component
Simple one part system
Resistance to vibration loosening of fasteners
Superior environmental resistance
Ease of use

GENERAL DESCRIPTION

PERMABOND PURE Anaerobic Adhesive/Sealants are single component liquids that cure only when in contact with metal parts and oxygen is excluded. Anaerobic adhesives are not truly "adhesives" as they work not by "sticking" parts together, but by filling the gap between mated parts and curing to a hard plastic, locking the assembly in place. Thus no relative movement between the parts is possible, and the potential loosening due to vibration is prevented. In addition to threadlocking, anaerobic adhesives can also be used as sealants as they fill (100%) and seal the gap between mated parts. PERMABOND PURE Threadlocking Adhesives/Sealants cure to a tough, crosslinked plastic that has excellent environmental and temperature resistance.

PERMABOND PURE Anaerobic Threadlocking Adhesive/Sealants conform to all applicable requirements of the ANSI/NSF Standard 61, Drinking Water System Components - Health Effects, as certified by the National Sanitation Foundation and the American National Standards Institute. Standard 61 was developed in conjunction with regulatory agencies, industry, water suppliers, consultants, and other users of the products covered in the standard. Standard 61 establishes requirements for the control of potential adverse human health effects from products added to water indirectly via contact with treatment, storage, transmission, and distribution system components. The NSF standards are widely recognized by public health officials, and certified products have been tested and determined to cause no adverse health effects.

Non-Warranty: The information given and the recommendations made herein are based on our research and are believed to be accurate but no guarantee of their accuracy is made. In every case we urge and recommend that purchasers before using any product in full-scale production make their own tests to determine to their own satisfaction whether the product is of acceptable quality and is suitable for their particular purpose under their own operating conditions. THE PRODUCTS DISCLOSED HEREIN ARE SOLD WITHOUT ANY WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED.

No representative of ours has any authority to waive or change the foregoing provisions but, subject to such provisions, our engineers are available to assist purchasers in adapting our products to their needs and to the circumstances prevailing in their business. Nothing contained herein shall be construed to imply the non-existence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of this patent. We also expect purchasers to use our products in accordance with the guiding principles of the Chemical Manufacturers Association's Responsible Care[®] program.

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PHYSICAL PROPERTIES OF THE UNCURED ADHESIVE/SEALANT

<u>Properties</u>	<u>MM185 PURE</u>
Base Resin	Methylacrylates
Solids, %	100
Color	Red
Mean Viscosity, cP* at 25°C (77°F)	1500-3000
Specific Gravity	1.02
Flash Point °C (°F)	110 (230)
Gel Time, minutes	30-60
Shelf Life stored at or below 27°C (80°F), months**	12
Maximum Gap Filling, inches	0.004

*MM185 is thixotropic, i.e., easy to dispense, but undergoes no migration when the adhesive is on the parts.

**Package sizes greater than one liter, six months.

SPEED OF CURE

Typical Fixturing Time 15 minutes
 Full Strength 3 hours

BEHAVIOR ON DIFFERENT METALS

PERMABOND PURE Threadlocking Compounds perform best on steel, but will perform well on most metals, including aluminum, stainless steel, brass, and plated fasteners. They will also perform well on oily parts, but for optimum results the parts should be cleaned before hand. When used on passive materials, speed of cure is slowed somewhat and ultimate strength may also be reduced. Generally, metals that induce a "fast cure" will achieve fixturing strength in about 15 minutes, while less active metals that induce a "slow cure" will take about 30 minutes to fixture.

ACTIVITY OF MATERIALS AND FINISHES

Super Active	Active	Inactive	Passive
Brass Copper Magnesium	Iron Steel Aluminum Nickel	Anodized Aluminum Cadmium Finishes Chrome Finishes Passivated Metals Stainless Steel Titanium Zinc	Ceramics Glass Plastics Paint Finishes

EFFECT OF TEMPERATURE ON CURE SPEED

PERMABOND PURE products are designed to cure at room temperature but can be accelerated by heat if a faster cure is needed. Heating the liquid sealant above 120°C (248°F) is not recommended [once cured, it has an upper temperature limit of 200°C (392°F)]. For every 10°C rise in temperature, the rate of cure will double. Conversely, for every 10°C drop in temperature, the rate of cure is reduced by a factor of two.

PERFORMANCE PROPERTIES OF THE CURED ADHESIVE/SEALANT

<u>Locking Strength (in-lb)*</u> Break Prevail	70-200 20-200
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* Note: When measured on cleaned grade 5 bolts and steel nut (3/8-16UNC2) per Mil-S-46163.

ELECTRICAL & THERMAL PROPERTIES

Dielectric Strength, MV/m	>11.0
Electrical Resistance, ohm	10^{17}
Thermal Conductivity, W/m ^{°K}	0.19
Thermal Expansion Coefficient, in/in ^{°C}	80×10^{-6}
Operating Temperature, °C (°F)	200 (392)

HEAT RESISTANCE

Since PERMABOND PURE products cure to a crosslinked, thermoset plastic, they exhibit excellent environmental and heat resistance. However, they are organic materials, so the extreme upper limit is approximately 200°C (392°F). Low temperatures do not markedly affect strength.

CHEMICAL RESISTANCE

The fully cured and crosslinked threadlocking adhesive/sealants resist most chemicals well, even at elevated temperatures. Chemical washes of any kind will have no effect on the adhesives because of the generally short duration of exposure. Anaerobic products are not recommended for use in the severe environment of pure oxygen or strong acids or alkalis.

VIBRATION RESISTANCE

MM185 PURE prevents loosening of mated parts under vibration. In fact, it performs significantly better than lockwashers, springwashers, nylon patch (prevailing torque screws), and other so-called vibration resistant locking systems. The following table shows an accelerated vibration test done with a transverse vibration tester. It shows that lockwashers actually aid the loosening of the fastener under conditions of vibration. Nylon patches and other prevailing torque systems may provide some resistance, but only anaerobic adhesive/sealants provide complete resistance to vibration. This is because only anaerobic compounds fill the gaps between mated parts and thus no movement of the parts is possible. Therefore, the assembly will not loosen due to vibration.

Clamping Load Retained Under Vibration - Clamping Force Retained

	<u>10 seconds</u>	<u>20 seconds</u>	<u>40 seconds</u>
Plain Nut	66%	40%	10%
Split Washer	40%	10%	<5%
Anaerobic Sealant*	95%	95%	95%

*The initial loss in bolt tension is caused by the relaxation of the metal parts.

EFFECT OF LUBRICITY

PERMABOND MM185 PURE is specifically designed to provide a lubricity similar to "as received" fasteners so that standard torque tension tables can be used. Other non-lubricated anaerobic products generally will result in a frictional factor of approximately 20-25% on "as received" fasteners.

MATERIAL COVERAGE

PERMABOND PURE Anaerobic Threadlockers are an inexpensive way of locking parts against vibration. They need only be applied in amounts sufficient to fill the inner air space between male and female parts. Any excess of product provides no additional locking action.

APPLICATION & DISPENSING

PERMABOND MM185 PURE can be readily dispensed directly out of the bottle onto the parts. The products are also suitable for application through automated dispensing equipment. PERMABOND's Equipment Group has a complete line of dispensing equipment for all types of assembly and automated applications. Custom specialty equipment can be designed to meet the specific application requirements. Contact your local PERMABOND Sales Engineer for a complete systems approach to dispensing and applying the MM185 PURE.

STORAGE & HANDLING

PERMABOND PURE products have a shelf life of one year when stored at or below 27°C (80°F). Do not freeze.

The containers are low-density polyethylene and are shaped so air can penetrate easily into the body of the anaerobic compound. A large air space is also used to help provide further stability. Contamination with metal could cause the anaerobic to polymerize in the "air starved" center of the container. "Leftover" product should never be poured back into the container.

UNCURED (LIQUID) ANAEROBIC ADHESIVE/SEALANTS

Uncured anaerobic compounds contain reactive chemicals. These chemicals can cause skin irritation on individuals with sensitive skin. Good housekeeping to keep work areas and tools clean, is usually sufficient to prevent skin irritation. Barrier creams and plastic gloves should be used to ensure worker protection against accidental or chronic exposure.

Atomizing the liquid compound into the air can allow it to be inhaled and thereby expose the lungs to the contact irritation possible on the skin. Spray applications are not recommended.

CURED (SOLID) ANAEROBIC ADHESIVE/SEALANT

The cured product is a hard inert plastic that is safe to handle. The curing reaction reacts all of the liquid adhesive (100%) into the solid plastic. No solvents or other substances are released upon cure as is the case with many other adhesives. Once cured, MM185 PURE has been determined to cause no adverse health effects and is a NSF certified drinking water system component.

FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.