

PERMABOND[®] HH190

*High Strength, High Viscosity
Anaerobic Gasketmaker[®]*

Permabond[®]
Engineering Adhesives

Ref #: 022708PBHH190

TYPICAL APPLICATIONS

General Maintenance

Flange sealant

Replaces traditional, pre-cut gaskets

Cured material does not “relax” like rubber gaskets, eliminating the need for re-torquing
Provides an ultimate seal greater than 5000 psi

General Assembly

Non-sag, flowable paste

Provides a flexible seal between two flange faces

Typical Industries Served

Automotive

Appliances

Equipment

FEATURES & BENEFITS

- ◆ Eliminates pre-cut gaskets from flange assemblies
- ◆ Forms an instant, pressure resistant, leak-free seal
- ◆ Allows adjustments up to 60 minutes after assembly
- ◆ Forms a tough, durable seal able to withstand high pressure
- ◆ No need to re-tighten flange bolts
- ◆ Non-flammable
- ◆ Suitable for high-speed production
- ◆ No shimming effects – better load transmission

GENERAL DESCRIPTION

PERMABOND HH190 Gasketmaker is an anaerobic curing flange sealant that can replace, or be used as a dressing for, conventional pre-cut gaskets. Since **PERMABOND HH190** Gasketmaker is a flowable paste, it conforms to the shape of the flange. The consistency allows metal to metal contact of the flanges while filling the areas where no contact exists because of irregularities. HH190 results in uniform stress distribution and eliminates the need for re-torquing because of stress relaxation of the flange bolts. It provides instant seal depending on the gap and flange width and ultimate seal up to 5000 psi. Because of the flexible nature of the cured polymer, **PERMABOND HH190** Gasketmaker has good vibration and shock resistance. **PERMABOND HH190** Gasketmaker provides convenience of assembly and is easy to dis-assemble as well.

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

<u>Properties</u> Base Resin Solids, % Color Viscosity, cP, 25°C (77°F) Consistency Gap Filling, in Specific Gravity Flash Point, °C (°F) Shelf Life stored at or below 27°C (80°F), months*	Methacrylate Ester 100 Purple 600,000 Flowable paste 0.025 1.08 >110 (230) 12
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*Package sizes greater than one liter, six months.

SPEED OF CURE

Cure rate of **HH190** @ room temperature, 25°C (77°F)

Fixture Time, minutes	15
Full Cure, hours	24

*The fixture time refers to the pot life of the sealant after application between two steel substrates with a 10 mil gap.

BEHAVIOR ON DIFFERENT SUBSTRATES

PERMABOND HH190 Gasketmaker performs best on clean steel but performs satisfactorily on most metals including anodized aluminum, stainless steel, brass, oily and “as received” finishes, and plated fasteners. When used on “inactive and passive” materials, speed of cure is slowed and ultimate strength may be reduced. Generally, fixturing strength is achieved in approximately 15 minutes on active surfaces. Cure speed and strength may be accelerated by heat (up to 121°C [250°F]). Conversely, when temperatures during cure are below 21°C (70°F), speed of cure will be reduced. Use of **PERMABOND ASC10** Surface Conditioner will accelerate cure rates, but may affect ultimate strength up to a 25% strength reduction. **PERMABOND ASC10** Surface Conditioner may also be used for inducing cure on non-metals.

Activity of Materials and Finishes

Super Active	Active	Inactive	Passive
brass copper magnesium	iron steel nickel aluminum	anodized aluminum cadmium finishes chrome finishes passivated metals stainless steel titanium zinc	ceramics glass plastics painted finishes
Super Active Active Inactive Passive	Very fast cure Fast cure Slow cure No cure without PERMABOND ASC10 Surface Conditioner		

PERFORMANCE PROPERTIES OF THE CURED ADHESIVE

Cured at 25°C for 24 hours	
Torque, ISO 10964	
Breakaway, lb-in (N·m)	
M10 steel nuts and bolts	N/A
Prevail, lb-in (N·m)	
M10 steel nuts and bolts	N/A
Compressive shear strength, ISO 10123 (Steel pin and collars)	900 psi (6) N/mm ²

SEALABILITY

Instant Seal (5 mil gap), psi >75
 Full Seal (10 mil gap), psi >5000

PERMABOND HH190 Gasketmaker provides instant seal upon assembly and maximum seal after full cure. Both depend on the gap between flanges. When applied to aluminum flanges (or other passive metals), the speed of cure and thus development of full seal is reduced. The use of Anaerobic Surface Conditioner will provide faster full cure.

THERMAL PROPERTIES

HEAT RESISTANCE

PERMABOND HH190 Gasketmaker cures to a cross linked, thermo set plastic with excellent resistance to environmental conditions and high temperatures. As an organic material, the maximum high temperature performance is achieved at temperatures below 250°F.

HEAT AGING

Heat aged substrates were tested at room temperature, following 300 hours at 150°C (300°F). The strength retention of **PERMABOND HH190** Gasketmaker is 80% of the original strength.

HOT STRENGTH

The hot strength retention of the cured HH190 Gasketmaker at 150°C (300°F) is approximately 50% of the original strength.

CHEMICAL RESISTANCE

When fully cured and cross linked, **PERMABOND HH 190** Gasketmaker resists most chemicals, even at elevated temperatures. Chemical washes of any kind will have no effect on the adhesive as they are of short duration. **PERMABOND HH190** Gasketmaker is not recommended for use in the severe environment of pure oxygen, or extremely strong acids and alkalis.

340 Hour Immersion	Temperature, °C (°F)	Full Strength Retained, %
Water	75 (168)	100
Butyl alcohol	75 (168)	100
Toluene	75 (168)	99
Motor oil	75 (168)	99
Hydrocarbon test fluid	75 (168)	100
JP4-jet fuel	75 (168)	93
JP5-jet fuel	75 (168)	100
Ethylene glycol	75 (168)	99

*For additional chemicals, consult the PERMABOND Bulletin: "PERMABOND Anaerobic Adhesives and Sealants Chemical Compatibility List"

APPLICATION & DISPENSING

1. For best results, clean all surfaces with a cleaning solvent and allow to dry.
2. If the substrates being used are inactive metals or the cure speed is too slow, then spray the parts with **PERMABOND ASC10** and allow to dry.
3. Apply as a bead, silk screen or stencil to one of the flanges. Make sure that all leak paths such as flange bolt holes are encircled.
4. Assemble parts as soon as possible.

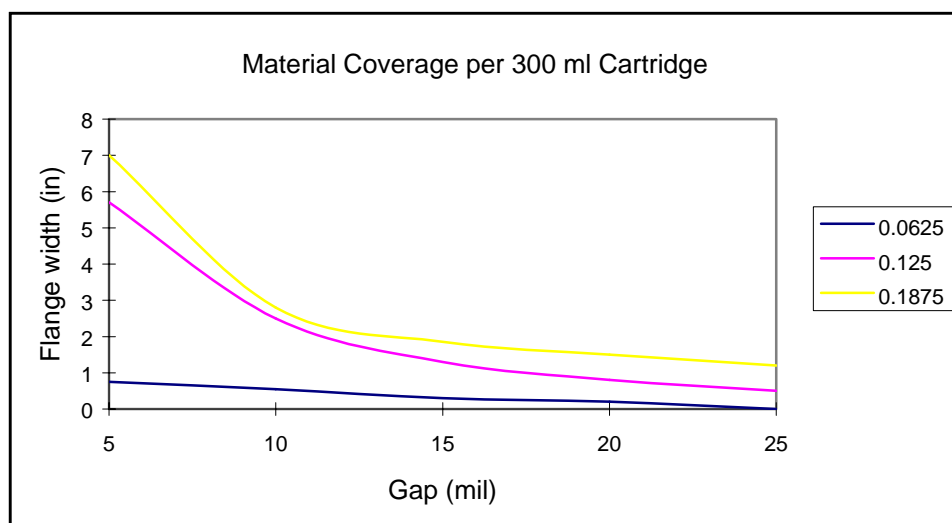
PERMABOND HH190 Gasketmaker can be directly dispensed from the tube or the cartridge using a manual or automatic cartridge gun. Apply the sealant on the inside of the bolt holes. Care has to be taken that single bead is deposited or this may lead to leak paths.

PERMABOND HH190 Gasketmaker does not cause shimming between the flanges, but allows for metal-to-metal contact. Only the air space between the flanges is filled by the **HH190** Gasketmaker. Thus, only a small amount is needed to provide sufficient sealing.

Coverage of a 300 ml cartridge is shown below:

Bead Diameter, in.	Length of Coverage, ft
0.0313	1989
0.0625	497
0.125	124
0.1875	55
0.25	31

The gap between flanges and the width of the flange determine the amount of the flange sealant to be deposited. For optimum bead size, refer to the figure below for dispensing nozzle selection.



STORAGE & HANDLING

PERMABOND HH190 Gasketmaker should be stored in the original container in a cool place away from sparks, flame, excessive heat and sunlight. Handling should be done using plastic gloves and proper eye protection. Skin contact should be avoided. If skin contact occurs, the affected area should be washed thoroughly with soap and water. Eye contact should be treated by thorough washing with water followed by medical attention. Adequate ventilation is necessary to prevent inhalation of vapors. Proper Personal Protective Equipment is always recommended when using chemicals. **For more information, consult the Material Safety Data Sheet.**

PERMABOND HH190 Gasketmaker has a shelf life of one year when stored at or below 27°C (80°F). Do not freeze. Product removed from original container might be contaminated during use. Do not return this material to the original container.

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