

PERMABOND[®] MH196

**High Strength, High Temperature Resistant
Anaerobic Gasketmaker[®]**

Ref.#: 111403PBMH196

Replaces #: new

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

- ◆ High Temperature resistant
- ◆ Eliminates pre-cut gaskets from flange assemblies
- ◆ Forms an instant, pressure resistant, leak-free seal
- ◆ 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[®] MH196 Gasketmaker is an anaerobic curing flange sealant that can replace, or be used as a dressing for, conventional pre-cut gaskets. The thixotropic property of the material prevents migration of the sealant before and during cure and allows the material to conform 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. MH196 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. It is best suited for applications requiring high temperature resistance. Because of the flexible nature of the cured polymer, PERMABOND[®] MH196 Gasketmaker has good vibration and shock resistance. PERMABOND[®] MH196 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	Methacrylate
Solids, %	100
Color	Red
Fluorescence	Under Blue Light
Viscosity, cP, 25°C (77°F)	50,000 – 350,000
Consistency	Thixotropic
Gap Filling, mm (in)	0.50 (0.02)
Specific Gravity	1.1
Flash Point, °C (°F)	>100 (212)
Shelf Life stored at or below 25°C (77°F), months*	12

*Package sizes greater than one liter, six months.

CURING PROPERTIES

<u>Cure Speed*</u>	
Fixture time (min)	10 - 20
Functional Time (hours)	1 - 3
Full Cure (hours)	6 - 12

*Measured on bolt M 10 x 20

BEHAVIOR ON DIFFERENT SUBSTRATES

PERMABOND® MH196 Gasketmaker performs best on clean steel but will perform 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 20 minutes on active metals and 40 minutes on passive metals. Cure speed and strength development 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 with 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	Inactive	Passive Active
Brass Copper Magnesium	Iron Steel Nickel Aluminum	Anodized aluminum Cadmium finishes Chrome finishes Passivated metals Painted finishes Stainless steel Titanium Zinc	Ceramics Glass Plastics
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

Shear Strength (ASTM D-1002), N/mm ² (psi)	8 – 13 (1150 – 1900)
Locking Torque	
Breakaway	7 – 10 (1000 – 1450)
Prevail	12 – 18 (106 – 160)
Tensile Strength(ASTM D-2095),N/mm ² (psi)	18 –24 (160 – 212)
Operating Temperature, °C (°F)	-55 to 200 (-67 to 392)

*Measured on bolt M10 x 20

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.

ELECTRICAL PROPERTIES

Dielectric Strength, MV/m	11
Electrical Resistance, Ωm	10 ¹⁷

THERMAL PROPERTIES

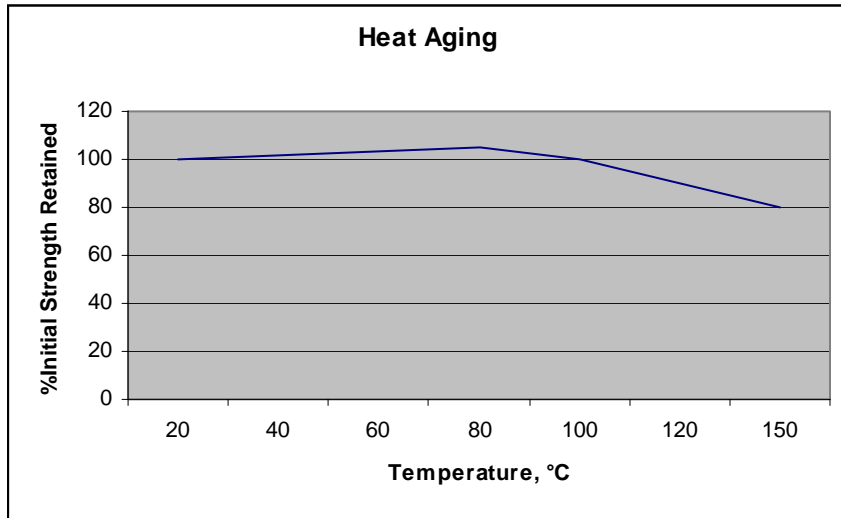
Thermal Conductivity, W/mK	0.19
Thermal Expansion Coefficient, in/in°C	90 x 10 ⁻⁶

HEAT RESISTANCE

PERMABOND® MH196 Gasketmaker cures to a crosslinked, thermoset plastic with excellent resistance to environmental conditions and high temperatures.

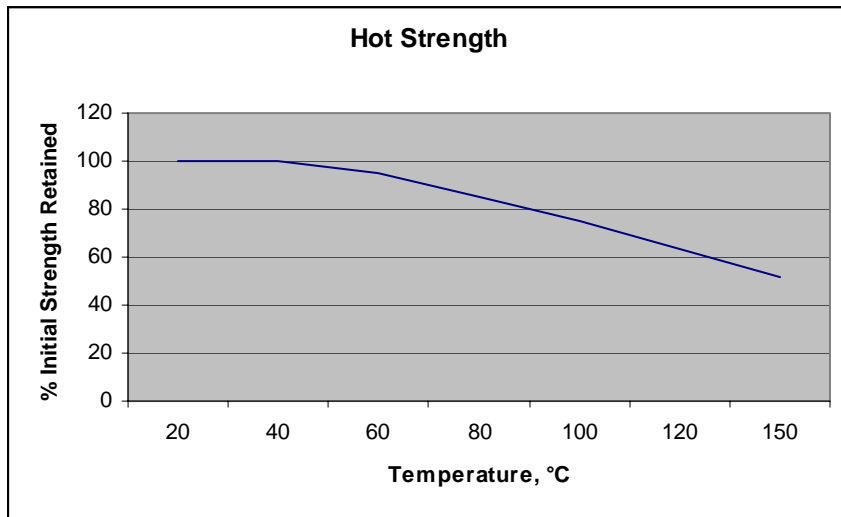
HEAT AGING

Heat aged substrates were tested at room temperature, following 300 hours at 150°C (300°F).



HOT STRENGTH

The strength retention of PERMABOND® MH196 Gasketmaker measured at elevated temperatures following 2 hours aging is shown:



CHEMICAL RESISTANCE

When fully cured and crosslinked, PERMABOND® MH196 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® MH196 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)	Initial 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 the parts should be cleaned before the material is applied. Dispense a continuous bead of MH196 on the flanges. Make sure that sufficient material is applied to fill all voids.
2. Mate the two substrates together and set the assembly aside for 15 minutes or until fixture strength is achieved.
3. Full cure is obtained within 12 hours of adhesive application at room temperature, 25°C (77°F).
 - ◆ The curing temperature may be increased to facilitate full cure of the adhesive.

PERMABOND® MH196 Gasketmaker may be readily dispensed from the bottle directly onto the parts. However, application via automated dispensing equipment is feasible.

STORAGE & HANDLING:

PERMABOND®MH196 Gasketmaker should be stored 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® MH196 Gasketmaker has a shelf life of one year when stored at or below 25°C (77°F). Do not freeze.

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