

PERMABOND[®] HM160

*High Strength, Medium Viscosity
Anaerobic Retaining Compound*



Ref. #: 030308PBHM160

TYPICAL APPLICATIONS

General Maintenance

Retaining keys and bearings
Reduces the need for highly machined surfaces

Reduces the cost required for highly finished surfaces
Seals against corrosion between two closely fitting parts

General Assembly

Eliminates the need to heat assemblies for press fits
Provides a seal between shafts and bearings

Typical Industries Served

Automotive
Appliances
Equipment

FEATURES & BENEFITS

- ◆ Reduces cost by allowing the use of lighter press fits
- ◆ Speeds production by utilizing easier to assemble tolerances
- ◆ Prolongs bearing life by reducing the stress on bearings caused by press fits
- ◆ Improves alignment by filling space between bearing rings and housings
- ◆ Keeps machinery on line by dressing worn parts
- ◆ Strengthens the joint by augmenting the press fit used to assure concentricity of the shafts and bearings
- ◆ Prevents corrosion between mated parts by excluding air and moisture from the joint
- ◆ Prevents loosening caused by vibration and thermal expansion

GENERAL DESCRIPTION

PERMABOND HM160 is a medium viscosity liquid adhesive that cures when confined between metal parts to form a tough, hard plastic. In the uncured, liquid state, the adhesive wets the metal surfaces, keying into all surface irregularities and fills the space between the mated parts.

The anaerobic curing mechanism delays the cure to allow for proper assembly and alignment. Once cured, the anaerobic adhesive fills the space between the parts preventing loosening from vibration or thermal expansion. When cured, the HM160 seals the joint against attack by harsh environments.

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.

PERMABOND

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PHYSICAL PROPERTIES OF THE UNCURED ADHESIVE

| | |
|--|---------------------|
| <u>Properties</u> | |
| Base Resin | Methacrylate Esters |
| Solids, % | 100 |
| Color | Green |
| Viscosity, cP, 25°C (77°F) | 600 |
| Consistency | Liquid |
| Diametric Clearance, in | 0.008 |
| Specific Gravity | 1.08 |
| Flash Point, °C (°F) | >110 (230) |
| Shelf Life stored at or below 27°C (80°F), months* | 12 |

*Package sizes greater than one liter, six months.

SPEED OF CURE

| | |
|---------------------------|----|
| Speed of Cure* | |
| Fixture Strength, minutes | 10 |
| Full Strength, hours | 24 |

*Measured on clean steel bolts and steel nuts.

BEHAVIOR ON DIFFERENT SUBSTRATES

PERMABOND HM160 Retaining Compound 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 10 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 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 | 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's 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 | 250 (28) |
| Prevail, lb-in (N·m) | |
| M10 steel nuts and bolts | 400 (45) |
| Compressive shear strength, ISO 10123 (Steel pin and collars) | 3000 psi (21) N/mm ² |

THERMAL PROPERTIES

HEAT RESISTANCE

PERMABOND HM160 Retaining Compound cures to a crosslinked, thermoset plastic with excellent resistance to environmental conditions and high temperatures. The maximum temperature recommended for use is 177°C (350°F).

HEAT AGING

Heat aged substrates were tested at room temperature, following 1000 hours at 150°C (300°F). The strength retention of **PERMABOND HM160** Retaining Compound is 80% of the original strength.

Shear Strength of Steel/Steel, psi >2500

HOT STRENGTH

The hot strength retention of the cured **HM160** Retaining Compound at 300°F is approximately 65% of the original strength.

Shear Strength of Steel/Steel, psi >2000

CHEMICAL RESISTANCE

When fully cured and crosslinked, **PERMABOND HM160** Retaining Compound 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 HM160** Retaining Compound 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. On slip fitted assemblies, apply adhesive on the leading edge of the pin and on the inside of the collar. Assemble with twisting action.
4. On press fitting assemblies, apply the adhesive on the pin and collar. Assemble using a press.
5. On shrink fitted assemblies, apply the adhesive to the pin, heat the collar to create enough clearance and assemble.
6. Allow the parts to fixture before disturbing them.

PERMABOND HM160 Retaining Compound may be readily dispensed from the bottle directly onto the parts. However, application via automated dispensing equipment is feasible.

STORAGE & HANDLING

PERMABOND HM160 Material 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 HM160 Retaining Compound 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.