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Permabond® Engineering Adhesives

PERMABOND® HM160

Anaerobic Retaining Compound

Technical Datasheet

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 stress 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

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.

MIL-R-46082B Type II
Each lot of HM160 is tested to the lot requirements of these specifications.
ASTM D5363 AN 0412 Group 04 Class 1 Grade 2
Each lot of HM160 is tested to the general requirements defined in paragraphs 5.1.1 and 5.1.2 and the detail requirements defined in section 5.2

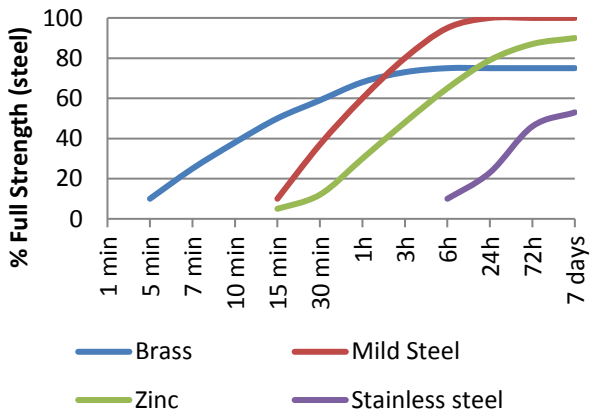
Physical Properties of Uncured Adhesive

Chemical composition	Methacrylates
Appearance	Green
Viscosity @ 25°C	600 mPa.s *(cP)*
Specific gravity	1.1
UV fluorescence	Yes

Typical Curing Properties

Maximum gap fill Maximum thread size	0.2 mm *0.008 in* M30 ¾"
Time taken to reach handling strength (M10 steel) @23°C	15 minutes*
Full strength (M10 steel) @23°C	24 hours

Strength Development



**Cure times are typical at 23°C. Copper and its alloys will follow the faster cure while oxidised or passivated surfaces like stainless steel will tend towards the slower curve. Lower temperatures or large gaps will tend to extend the cure time. To reduce the cure time the use of Permabond A905, ASC10, or heat can be considered.*

Typical Performance of Cured Adhesive

Torque strength (M10 steel ISO10964)	Break 30 N·m *270 in.lb* Prevail 50 N·m *450 in.lb*
Shear strength (steel collar & pin ISO10123)	14 MPa *2000 psi*
Coefficient of thermal expansion	90 x 10^{-6} mm/mm/°C
Dielectric strength	11 kV/mm
Thermal conductivity	0.2 W/(m.K)

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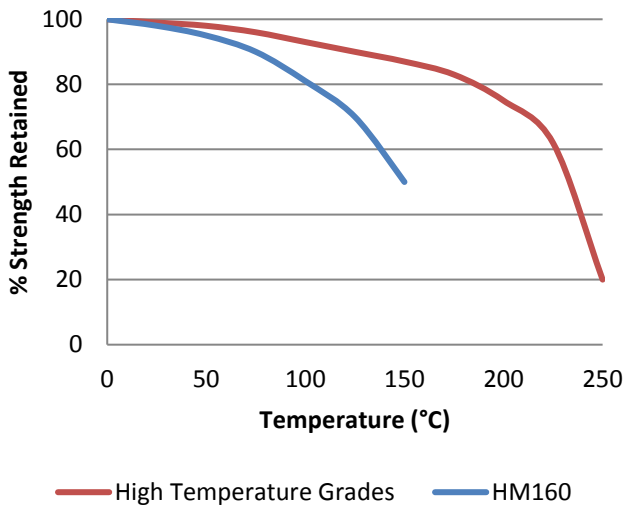
Hot Strength



"Hot strength" Breakaway strength on M10 Zinc plated bolts according to ISO 10964. Cured at 23°C for 24 hours then conditioned for 30 minutes at testing temperature.

HM160 can withstand higher temperatures for brief periods (such as for paint baking and wave soldering processes) providing the joint is not unduly stressed. The minimum temperature the cured adhesive can be exposed to is -55°C (-65°F) depending on the materials being bonded.

Chemical Resistance

340 Hour immersion	Temperature, °C (°F)	% 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

This product is not recommended for use in contact with oxygen, oxygen rich systems and other strong oxidizing materials. This product may adversely affect some thermoplastics and users must check compatibility of the product with such substrates before using.

Surface Preparation

Though the anaerobic adhesives will tolerate a slight degree of surface contamination, best results are obtained on clean, dry and grease free surfaces. The use of a suitable solvent-based cleaner (such as acetone or isopropanol) is recommended.
In general, roughened surfaces (~25µm) give higher bond strengths than polished or ground surfaces.
To reduce the curing time, especially on inactive surfaces (such as zinc, aluminium and stainless steel), the use of Permabond A905 or ASC10 can be considered.

Directions for Use

1. On slip fitted assemblies, apply adhesive on the leading edge of the pin and on the inside of the collar.
2. Assemble with twisting action.
3. On press fitting assemblies, apply the adhesive on the pin and collar. Assemble using a press.
4. On shrink fitted assemblies, apply the adhesive to the pin, heat the collar to create enough clearance and assemble.
5. Allow the parts to fixture before disturbing them.

Video Link

Retaining compound directions for use:
https://youtu.be/MUODE5ZfrZ8

Storage & Handling

Storage Temperature	5 to 25°C *(41 to 77°F)*
Users are reminded that all materials, whether innocuous or not, should be handled in accordance with the principles of good industrial hygiene. Full information can be obtained from the Safety Data Sheet.	

This Technical Datasheet (TDS) offers guideline information and does not constitute a specification.

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