Permabond® Engineering Adhesives

PERMABOND® HM161

Anaerobic Retaining Compound

Technical Datasheet

Features & Benefits

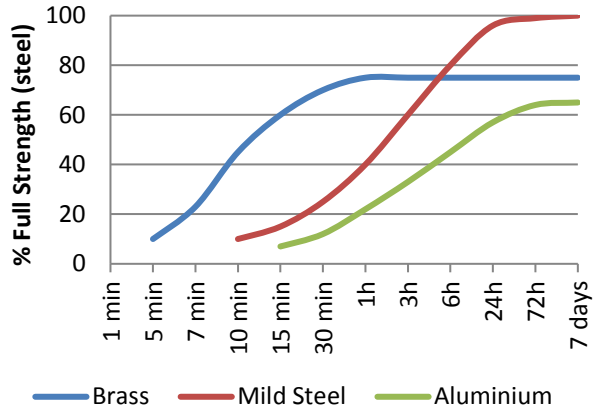
- Speeds up production
- Improves alignment
- Strengthens joint
- Simple one-part system
- Excellent shear strength
- Good environmental resistance

Description

Permabond® HM161 is a single component liquid that cures only when in contact with metal parts and oxygen is excluded. The liquid adhesive fills the "air space' between parts and upon cure unitizes and retains the mated parts. Thus it prevents their movement relative to each other, eliminating wear, erosion and pitting. HM161 cures to a tough cross-linked plastic that will prevent the corrosion of mated parts and provides excellent environmental and temperature resistance.

MIL-R-46082B Type III
Each lot of HM161 is tested to the lot requirements of these specifications.
ASTM D5363 AN 0421 Group 04 Class 2 Grade 1
Each lot of HM161 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

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.*

Physical Properties of Uncured Adhesive

Chemical composition	Methacrylates
Appearance	Green
Viscosity @ 25°C	2000 mPa.s *(cP)*
Specific gravity	1.1
UV fluorescence	Yes

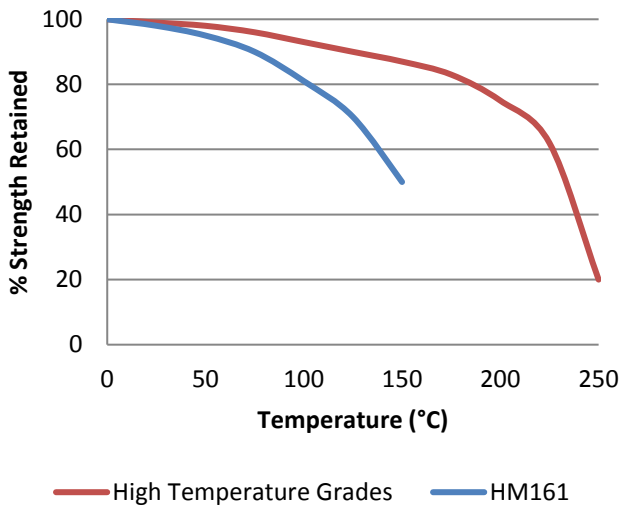
Typical Performance of Cured Adhesive

Torque strength (M10 steel ISO10964)	Break 31 N·m *275 in.lb* Prevail 45 N·m *400 in.lb*
Shear strength (steel collar & pin ISO10123)	24 MPa *3500 psi*
Coefficient of thermal expansion	90 x 10^{-6} mm/mm/°C
Dielectric strength	11 kV/mm
Thermal conductivity	0.2 W/(m.K)

Typical Curing Properties

Maximum gap fill Maximum thread size	0.25 mm *0.01 in* M30 ¾"
Time taken to reach handling strength (M10 steel) @23°C	10 minutes*
Full strength (M10 steel) @23°C	24 hours

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.

HM161 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)	94
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.

www.permabond.com
- ***UK: 0800 975 9800***
- ***General Enquiries: +44 (0)1962 711661***
- ***US: 732-868-1372***
- ***Asia: + 86 21 5773 4913***

info.europe@permabond.com
info.americas@permabond.com
info.asia@permabond.com