

### Features & Benefits

- 💧 Simple one-part fast cure low viscosity system
- 💧 Excellent shear strength
- 💧 Good environmental resistance

### Description

Permabond® HL138 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 which eliminates wear, erosion, and pitting. Permabond HL138 cures to a tough cross-linked plastic and provides excellent environmental and temperature resistance. Since Permabond® HL138 can fill up the inner space, shaft-hub assemblies can be made with a clearance fit and eliminates an expensive press fit, while actually increasing the push out force. PERMABOND® HL138 develops full strength quickly on a variety of metals and is used on high speed production lines.

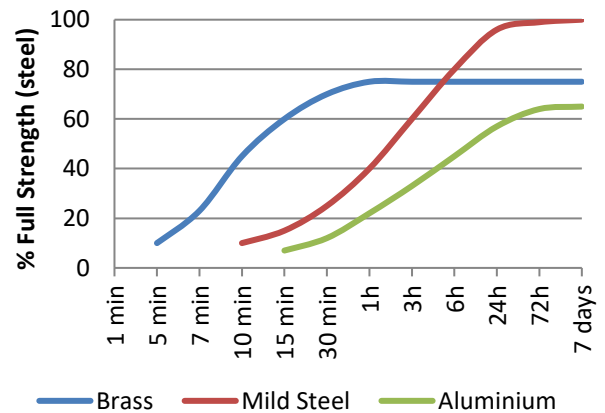
#### Mil-R-46082B

Permabond HL138 meets and has been tested to the type and grade requirements of Mil- R-46082B type I specification.

#### ASTM D5363

Permabond HL138 meets and has been tested to the group, class, and grade requirements for ASTM D5363 group 4, class 1, grade 1 requirements as defined in sections 5.1.1, 5.12, and 5.2 of the ASTM detailed guidelines.

### 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	Acrylic
Appearance	Green
Viscosity @ 25°C	150-300 mPa.s (cP)
Specific Gravity	1.1
UV fluorescence	No

### Typical Curing Properties

Maximum gap fill	0.127 mm <b>0.005 in</b>
Maximum thread size	M20 <b>¾"</b>
Time taken to reach handling strength (M10 steel) @23°C	10 minutes*
Time taken to reach working strength (M10 steel) @23°C	3 hours
Full strength (M10 steel) @23°C	24 hours

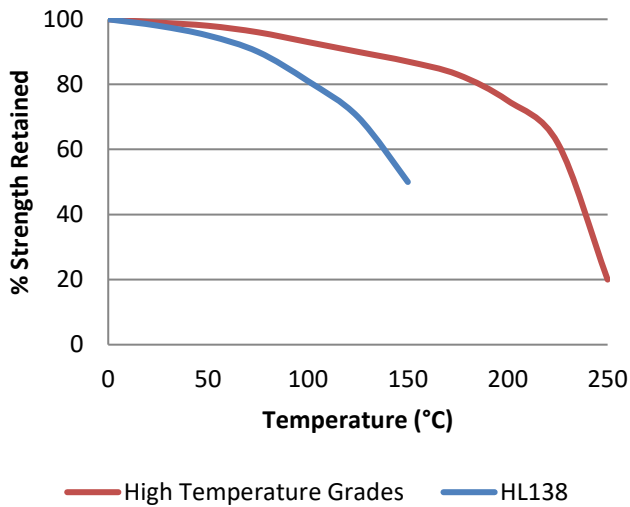
### Typical Performance of Cured Adhesive

Torque strength (M10 steel ISO10964)	Break 20 N·m <b>180 in.lb</b> Prevail 36 N·m <b>315 in.lb</b>
Shear strength (steel collar & pin ISO10123)	16 MPa <b>2300 psi</b>
Coefficient of thermal expansion	90 x 10 <sup>-6</sup> mm/mm/°C
Dielectric strength	11 kV/mm
Thermal conductivity	0.19 W/(m.K)

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## Hot Strength

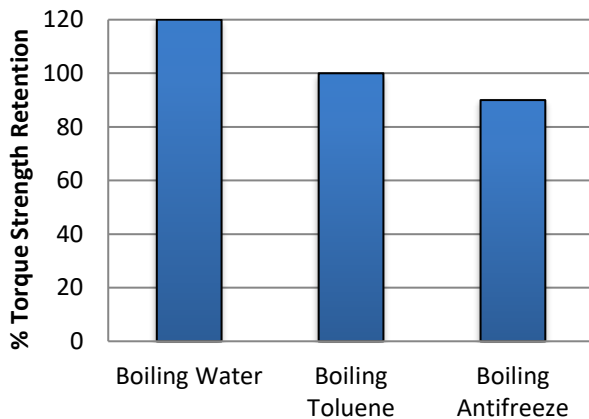


*"Hot strength" Breakaway strength on M10 Zinc plated bolts according to ISO 10964. Cured at 23°C for 24 hours then conditioned for 30 minutes at testing temperature.*

HL138 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

Steel M8 nuts & bolts  
7 days immersion



***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.

## 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.	

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