

### Features & Benefits

- 💧 Prevents vibration loosening
- 💧 Controlled off-torque
- 💧 Full cure at room temperature
- 💧 Low strength for easy disassembly
- 💧 Lubricates threads for easier assembly
- 💧 Provides corrosion protection
- 💧 Superior environmental resistance
- 💧 Environmentally friendly – 100% solids

### Description

**Permabond® LM113** Threadlocker is a medium viscosity product for locking small threaded fasteners, such as screws and bolts or hydraulic fittings that might require disassembly. Due to its thixotropic viscosity, the liquid adhesive will not run away from the area of application. PERMABOND's LM113 Threadlocker cures reliably and fast on steel, cadmium, zinc and other plated fasteners.

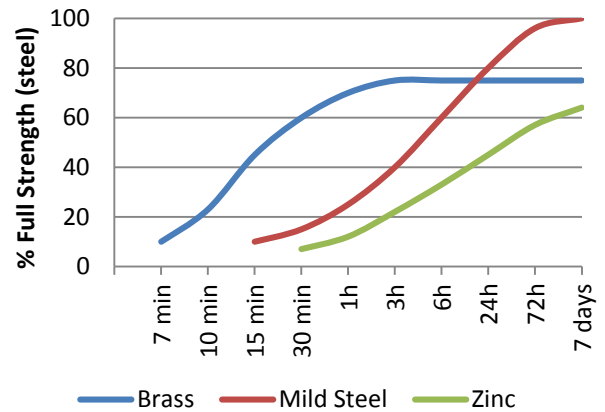
**Mil-S-46163A**      **Type II Grade M**

Each lot of LM113 is tested to the lot requirements of these specifications.

**ASTM D5363**      **AN 0311 Group 03 Class 1 Grade 1**

Each lot of LM113 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 oxidized 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	Methacrylate esters
Appearance	Purple
Viscosity @ 25°C	1,200 mPa.s (cP) Thixotropic
Specific gravity	1.1

### Typical Curing Properties

Maximum gap fill	0.15 mm <b>0.006 in</b>
Maximum thread size	M20 <b>¾"</b>
Time taken to reach handling strength (M10 steel) @23°C	15 minutes*
Full strength (M10 steel) @23°C	24 hours

\*Handling time at 23°C / 73°F. Copper and its alloys will make the adhesive cure more quickly, while oxidised or passivated surfaces (like stainless steel) will reduce cure speed. To reduce curing time, use Permabond activator A905 or ASC10 alternatively, increasing the curing temperature will reduce curing time.

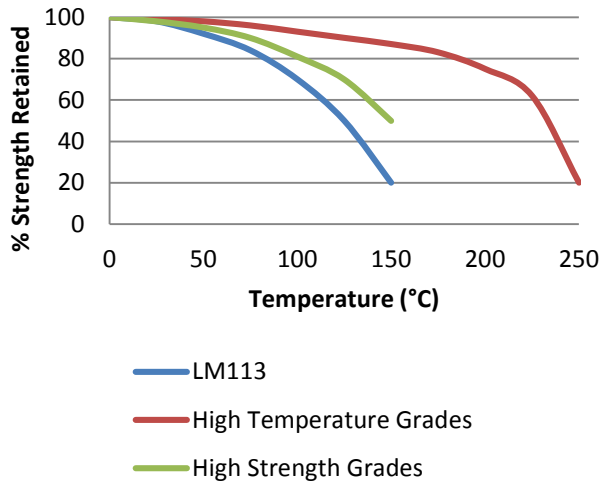
### Typical Performance of Cured Adhesive

Torque strength (M10 steel ISO10964)	Break 9 N·m <b>80 in.lb</b> Prevail 5 N·m <b>40 in.lb</b>
Shear strength (steel collar & pin ISO10123)	5 MPa <b>750 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)

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.

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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.*

LM113 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

Immersion (340 hours)	Temperature °C (°F)	Strength Retention (%)
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 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. 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) Prevent the tip from touching metal surfaces during application.
- 2) When working with through holes, dispense a bead of material across the contact length of the threads.
- 3) When working with blind holes, apply several drops down the threads to the bottom of the hole.
- 4) Assemble and torque the parts as necessary.
- 5) Replace lid to bottle to avoid contamination of remaining liquid adhesive.

## Storage & Handling

Storage Temperature	5 to 25°C (41 to 77°F)
Shelf Life Stored in original unopened containers	12 months
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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