PERMABOND TA459

Toughened Acrylic Adhesive

Provisional Technical Datasheet

Features & Benefits

- Adhesion to a wide variety of substrates
- Fast cure at room temperature
- Excellent adhesion to metals and ferrites
- Acid-free and non-corrosive
- No mix application
- High shear strength
- Good impact strength
- Good chemical resistance

Description

Permabond TA459 is a structural acrylic adhesive designed primarily for bonding metals, ferrites, ceramics and some thermoplastics. This product was specifically designed to be non-corrosive to sensitive copper parts or other electrically conductive surfaces.

TA459 is a no-mix system which obtains handling strength 15 – 30 seconds when the adhesive and the Initiator 43 come in contact and achieves 30% of its full strength in 3 minutes. The fast curing of this material allows for increased production rate.

Physical Properties of Uncured Adhesive

Chemical composition	**Urethane methacrylate**
Appearance	Blue, thixotropic
Viscosity @ 25°C	10,000-20,000 mPa s (cP)
Density	1.14

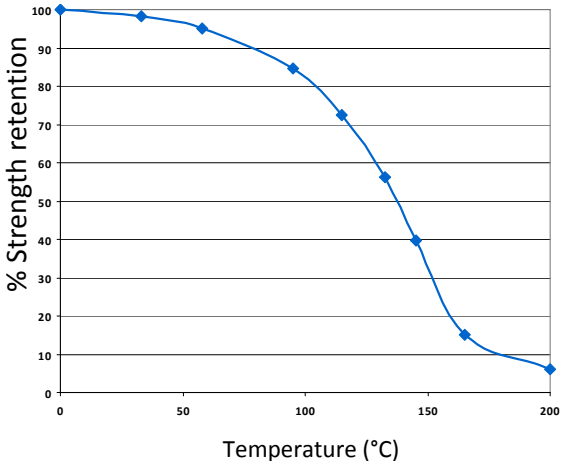
Typical Curing Properties

Ratio of use	10 : 1.5 approximately
Maximum gap fill	Up to 0.5 mm ***(0.02 in)***
Fixture time	15-30 seconds
Working strength (at +25°C/50% rh)	< 3 mins (with Initiator 43)
Full cure	24 hours

Typical Performance of Cured Adhesive

Shear Strength Zn plated after 24 h +25°C	12-18 MPa ***(1700 – 2610 psi)***
Shear Strength Ferrite/steel after 3 minutes +25°C	4 MPa ***(600 psi)***
Shear Strength Ferrite/steel after 24 hours +25°C	>14 MPa (substrate failure) ***(2000 psi)***
Shear Strength Steel/steel after 3 minutes +25°C	9 MPa ***(1300 psi)***
Shear Strength Steel/steel after 24 hours +25°C	20-25 MPa ***(2900 - 3600 psi)***
Tensile Strength stainless steel after 24 h +25°C	20-30 MPa ***(2900 - 4400 psi)***

Temperature Resistance



TA459 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.

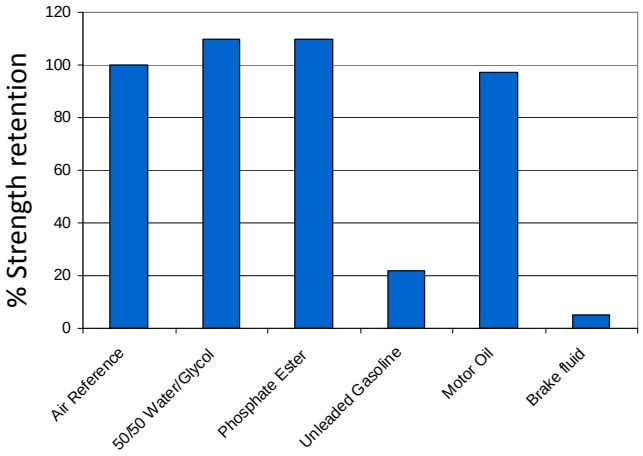
Environmental Resistance

All values were generated on as received steel lap shears as described in ASTM D 1002.
Adhesive was cured at room temperature for 48 hours prior to environmental exposure. Test pieces were assembled with no induced gap and subjected to continuous exposure for 1000 hours at the testing temperature and then the shear strength was tested at room temperature.

1000 hours @	% strength retention
95°C	110% *
120°C	118% *
150°C	132% *
175°C	127% *

**The shear strength is higher the room temperature control because heating the adhesive causes it to become more rigid, resulting in a higher strength.*

Chemical Resistance



Specimens were immersed for 30 days at 85ºC and tested at room temperature.

Additional Information

This product is not recommended for use in contact with strong oxidizing materials. Where aqueous washing systems are used to clean the surfaces before bonding, these aqueous washes can affect the cure and performance of the adhesive. This product may affect some thermoplastics and users must check compatibility of the product with such substrates.
Information regarding the safe handling of this material may be obtained from the material safety data sheet (MSDS). Users are reminded that all materials, whether innocuous or not, should be handled in accordance with the principles of good industrial hygiene.

Surface Preparation

Surfaces should be clean, dry and grease-free before applying the adhesive. Use a suitable solvent (such as acetone or isopropanol) for the degreasing of surfaces. Some metals such as aluminium, copper and its alloys will benefit from light abrasion with emery cloth (or similar), to remove the oxide layer.

Directions for Use

1) Surfaces must be clean, dry and grease-free.
2) Apply Initiator to one surface.
3) Apply adhesive to the other surface.
4) Assemble the components using sufficient force to spread the adhesive thinly. Parts should be bonded immediately and within a maximum of two hours of applying the Initiator.
5) Maintain pressure until handling strength is achieved. The time required will vary according to the joint design and surfaces being bonded.
6) Allow 24 hours for adhesive to fully cure. Accelerated cure times may be achieved by heating.

Storage & Handling

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

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