

Features & Benefits

- 💧 Adhesion to a wide variety of substrates
- 💧 Fast cure at room temperature
- 💧 No mix application
- 💧 High shear and peel strength
- 💧 Good impact strength
- 💧 High temperature resistance

Description

PERMABOND® TA437 is a single component structural acrylic adhesive designed primarily for bonding metals, ferrites and ceramics. The typical fixture time of TA437 when used with Initiator 41 is 20-30 seconds. The fast fixture time of TA437 makes it an ideal adhesive for high speed production lines. When the use of the activator is not desirable, the material will cure anaerobically in a close-fitting joint / in presence of metal, the fixture time will be 5-10 minutes. This product provides high strength, tough, durable bonds with good impact resistance.

Physical Properties of Uncured Adhesive

Chemical composition	Urethane methacrylate
Appearance	Orange/red viscous liquid
Viscosity @ 25°C	20rpm: 25,000 – 50,000 mPa.s (cP) 2.5rpm: 90,000 – 150,000 mPa.s (cP)
Specific gravity	1.1

Typical Curing Properties

Maximum gap fill	0.5 mm (0.02 in)
Fixture time (zinc) @23°C*	5-10 mins (no initiator) 20-30 secs (with Initiator 41)
Handling time (zinc)* (0.3 N/mm ² shear strength is achieved) @23°C	15-20 mins (no initiator) 1-3 mins (with Initiator 41)
Working strength (zinc)* @23°C	60-120 mins (no initiator) 30-60 mins (with Initiator 41)
Full cure @23°C	24 hours

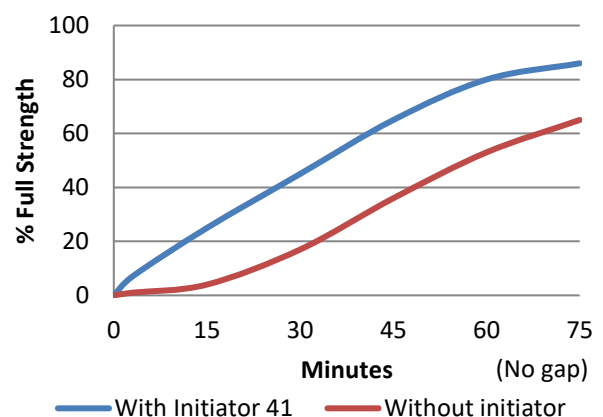
*No induced gap

Typical Performance of Cured Adhesive

Shear strength (ISO4587)*	Steel: 14-20 N/mm ² (2000-3000 psi) Zinc: 10-15 N/mm ² (1450-2200 psi)
Shear strength (steel to ferrite) using Initiator 41	After 3 minutes: 4 N/mm ² (600 psi) After 24 hours: >14 N/mm ² (>2000 psi) (substrate failure)
Peel strength (aluminium) (ISO 4578)	45-65 N/25mm (10-14 PIW)
Tensile strength (ISO37)	30N/mm ² (4350 psi)
Impact strength (ASTM D-950)	10-15 kJ/m ²
Coefficient of thermal expansion (ASTM D-696)	80 x 10 ⁻⁶ 1/K
Thermal conductivity (ASTM C-177)	0.1 W/(m.K)
Dielectric constant (ASTM D-150)	4.6
Dielectric strength (ASTM D-149)	30-50 kV/mm
Volume resistivity (ASTM D-257)	2 x 10 ¹³ Ohm.cm

*Strength results will vary depending on the level of surface preparation and gap.

Strength Development

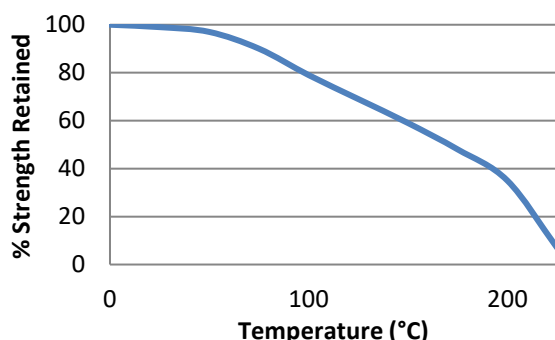


Graph shows typical strength development of bonded components at 23°C. Curing at higher or lower temperatures may affect cure speed.

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Hot Strength



"Hot strength" shear strength tests performed on mild steel. Fully cured specimens conditioned to pull temperature for 30 minutes before testing at temperature. TA437 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.

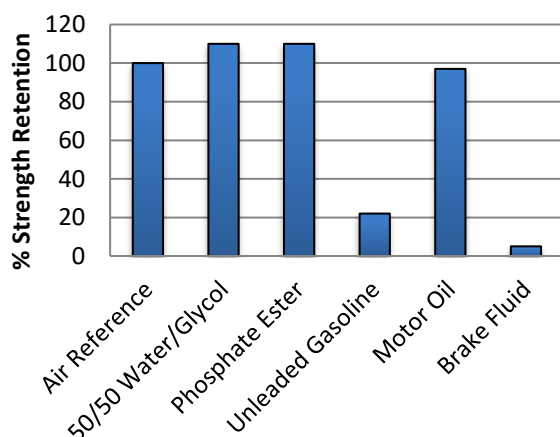
Environmental Resistance

All values were generated on as received steel lap shears as described in ISO4587. 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% *
205°C	97%

*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 85°C and tested at room temperature.

Additional Information

This product is not recommended for use in contact with strong oxidizing materials. 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 Safety Data Sheet.

Users are reminded that all materials, whether innocuous or not, should be handled in accordance with the principles of good industrial hygiene.

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

Surface Preparation

Surfaces should be clean, dry and grease-free before applying the adhesive. Permabond Cleaner A is recommended for the degreasing of most 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. Apply Initiator 41 to one surface (if using initiator to reduce cure time).
- 2) Apply adhesive to the other surface.
- 3) 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.
- 4) Maintain pressure until handling strength is achieved. The time required will vary according to the joint design, gap and surfaces being bonded.
- 5) Allow 24 hours for adhesive to fully cure. Accelerated cure times may be achieved by heating.

Video Links

Surface preparation:

<https://youtu.be/8CMOMP7hXjU>



Structural acrylic directions for use:

<https://youtu.be/gyp27lwgnUg>



Storage & Handling

Storage Temperature

5 to 25°C (41 to 77°F)

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