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Permabond® Engineering Adhesives

# PERMABOND® TA440

## *Toughened Acrylic Adhesive*

Technical Datasheet

## *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
- Good chemical resistance

## *Description*

**PERMABOND® TA440** is a two component structural acrylic adhesive suitable for bonding metals, glass, wood, ferrites, ceramics and some rigid plastics. This adhesive may be used in a variety of structural bonding applications due to its versatile performance capabilities.
**Permabond TA440** provides high strength while maintaining excellent flexibility, resulting in tough, durable bonds with outstanding impact and peel resistance. Handling strength is achieved in a few minutes at room temperature.

## *Physical Properties of Uncured Adhesive*

| | **TA440 A** | **TA440 B** |
|---|---|---|
| Chemical composition | Urethane methacrylate | Urethane methacrylate |
| Colour | Amber | Green |
| Mixed colour | Green | |
| Viscosity @ 25°C | 20 rpm: 5,000-12,000 mPa.s *(cP)* | 20 rpm: 5,000-12,000 mPa.s *(cP)* |
| Specific gravity | 1.1 | 1.1 |

## *Typical Curing Properties*

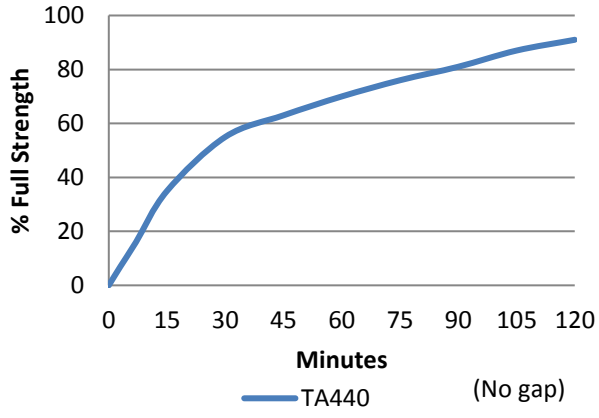
| | |
|---|---|
| Ratio of use | 1 : 1 |
| Maximum gap fill | 0.5 mm *(0.02 in)* |
| Fixture time (zinc) @23°C | No gap: 15-30 seconds |
| Handling time (zinc) *(0.3 N/mm² shear strength is achieved)* @23°C | No gap: 60-90 seconds |
| Working strength (zinc) @23°C | No gap: 30-60 minutes |
| Full cure @23°C | 24 hours |

## *Typical Performance of Cured Adhesive*

| | |
|---|---|
| Shear strength (ISO4587)* | Mild steel: 15-25 N/mm² *(2200-3600 psi)*<br>Zinc: 10-15 N/mm² *(1450-2200 psi)* |
| Peel strength (ISO 4578) | 45-65 N/25mm *(10-14 PIW)* |
| Tensile strength (ISO37) | 25N/mm² *(3600 psi)* |
| Impact strength (ASTM D-950) | 10-15 kJ/m² |
| 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 MHz |
| Dielectric strength (ASTM D-149) | 30-50 kV/mm |
| Volume resistivity (ASTM D-257) | 2 x $10^{13}$ Ohm.cm |

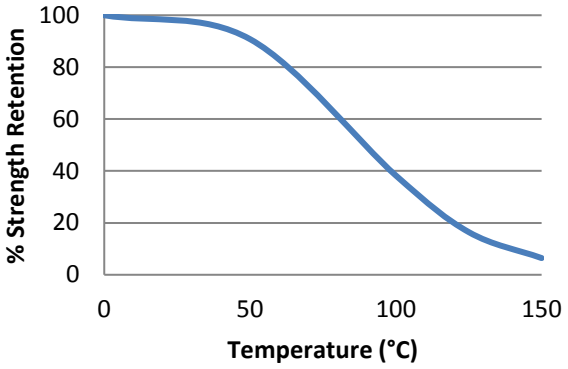
**Strength results will vary depending on the level of surface preparation and gap.*

### *Strength Development*




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

## Hot Strength




*"Hot strength" shear strength tests performed on mild steel. Product fully cured at room temperature and conditioned to pull temperature for 30 minutes before testing.*

TA440 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.

## 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 prior to bonding.
2) Apply TA440A to one surface and TA440B to the other.
3) Alternatively, dispense 'bead-on-bead' (one bead on top of the other) and then assemble parts.
4) Applying adhesive side by side is not advisable ad this may not achieve adequate mixing.
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.

## 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.**

## Video Links

Surface preparation:
https://youtu.be/8CMOMP7hXjU

TA440 directions for use:
https://youtu.be/_sjy33swmBg

## Storage & Handling

| | |
|---|---|
| Storage Temperature | 5 to 25°C *(41 to 77°F)* |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