PERMABOND® TA4605
Toughened Acrylic Adhesive
Technical Datasheet

Features & Benefits
- Adhesion to a wide variety of substrates
- Full cure at room temperature
- Bonds polyolefins
- No primer required
- Good impact strength
- Good chemical resistance

Description
PERMABOND® TA4605 is a 2-part, 1:1 toughened acrylic adhesive. It has been developed to bond low surface energy plastics such as polypropylene and polyethylene – with no primer or surface treatment required. It can also be used to bond a wide variety of other materials such as metals and composite materials and is ideal for bonding dissimilar surfaces.

Physical Properties of Uncured Adhesive

<table>
<thead>
<tr>
<th></th>
<th>TA4605 A</th>
<th>TA4605 B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical composition</td>
<td>Methacrylate</td>
<td>Methacrylate</td>
</tr>
<tr>
<td>Colour</td>
<td>Off-white</td>
<td>Almost colourless</td>
</tr>
<tr>
<td>Mixed colour</td>
<td>Off-white</td>
<td></td>
</tr>
<tr>
<td>Viscosity @ 25°C</td>
<td>150,000-400,000 mPa.s (cP)</td>
<td>20,000-30,000 mPa.s (cP)</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.0</td>
<td>1.0</td>
</tr>
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</table>

Typical Curing Properties

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Ratio of use</td>
<td>1 : 1</td>
</tr>
<tr>
<td>Maximum gap fill</td>
<td>1 mm (0.04 in)</td>
</tr>
<tr>
<td>(NB: Contains microparticles to control gap)</td>
<td></td>
</tr>
<tr>
<td>Pot life (2g+2g) @23°C</td>
<td>2-4 minutes</td>
</tr>
<tr>
<td>Fixture time (0.1 N/mm² shear strength is achieved) @23°C</td>
<td>5-10 minutes</td>
</tr>
<tr>
<td>Handling time (0.3 N/mm² shear strength is achieved) @23°C</td>
<td>20-25 minutes</td>
</tr>
<tr>
<td>Working strength @23°C</td>
<td>2-4 hours</td>
</tr>
<tr>
<td>Full cure @23°C</td>
<td>24 hours</td>
</tr>
</tbody>
</table>

Typical Performance of Cured Adhesive

Shear strength (ISO4587)
- Polypropylene: >8 N/mm² (>1200 psi)*
- Polyethylene: >7 N/mm² (>1000 psi)*
- Aluminium / PE: 3-6 N/mm² (435-870 psi)
- PTFE: 1.5 N/mm² (220 psi)
- ABS: >4 N/mm² (>580 psi)*
- Polycarbonate: >5 N/mm² (>725 psi)*
- PVC: >5 N/mm² (>725 psi)*
- EPDM: >3.5 N/mm² (>500 psi)*
- PA6: >3.5 N/mm² (435-725 psi)

*Substrate failure was observed.

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

Hot Strength

Fully cured lap shear specimens conditioned to pull temperature for 30 minutes before testing at temperature. TA4605 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 depending on the materials being bonded.
**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 (SDS).

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.

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**Surface Preparation**

Surfaces should be clean, dry and grease-free before applying the adhesive. Polyolefin surfaces may have traces of mold release agent present – wipe with isopropanol (IPA) solvent and allow to fully evaporate before bonding. If bonding to metal: 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 a thin bead of adhesive pre-mixed through a static mixer nozzle.
3) Assemble components and clamp.
4) Maintain pressure until handling strength is achieved. The time required will vary according to the joint design and surfaces being bonded.
5) Allow 24 hours for adhesive to fully cure.

NB: Adhesive outside of a closed joint (i.e. excess material) will cure more slowly and may be soft due to air contact. Adhesive inside the joint will cure solid.

**Video Links**

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

Structural acrylic directions for use:  
https://youtu.be/YVeKBCVVhYo

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**Other Products Available**

- **Anaerobics**
  - Thread lockers
  - Thread sealants
  - Gasket makers
  - Sealants / retainers

- **Cyanacrylates**
  - Instant adhesives
  - For rapid bonding of metals, plastics, rubber and many other materials

- **Epoxytes**
  - Two-part room temperature cure adhesives
  - Single-part heat cure adhesives
  - Modified Technology (MT) flexible grades available

- **MS-Polymers**
  - Single-part, moisture-curing, flexible sealants

- **Polyurethanes**
  - Two-part room temperature curing adhesives

- **Toughened Acrylics**
  - Rapid curing, high strength structural adhesives

- **UV Light Cured Adhesives**
  - Glass / plastic bonding
  - Optically clear
  - Non-yellowing

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**Storage & Handling**

| Storage Temperature | Cartridges: 5 to 25°C (41 to 77°F) | Bulk: 2 to 7°C (35 to 45°F) |

This product may separate slightly – in this instance, invert container to re-disperse.

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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. No representative of ours has any authority to waive or change the foregoing provisions but, subject to such provisions, our engineers are available to assist purchasers in adapting our products to their needs and to the circumstances prevailing in their business. Nothing contained herein shall be construed to imply the non-existence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of this patent. We also expect purchasers to use our products in accordance with the guiding principles of the Chemical Manufacturers Association’s Responsible Care® program.