

### Features & Benefits

- 💧 Cure on demand
- 💧 Non-drip
- 💧 High shear strength
- 💧 Fast curing with low-power lamps
- 💧 100% solids, no solvents
- 💧 Excellent adhesion to plastics

### Description

**PERMABOND® UV649** is a single part, fast setting, and UV curable adhesive designed specifically for bonding plastics. This material has excellent adhesion to a variety of plastics including polycarbonate as well as metals and glass. **Permabond UV649** has very high shear strength, elongation and impact resistance making it ideal for applications that require substrates with different coefficients of thermal expansion. **Permabond UV649** has good depth of curing capabilities which make it suitable for use as a sealant.

### Physical Properties of Uncured Adhesive

|                      |  |
|----------------------|--|
| Chemical composition | Methacrylate ester   |
| Appearance           | Colourless, clear  |
| Viscosity @ 25°C     | 20rpm: 20,000-30,000 mPa.s (cP)<br>2.5rpm: 80,000-150,000 mPa.s (cP) |
| Specific gravity     | 1.1  |

### Typical Curing Properties

|                                 |   |
|---------------------------------|---|
| Typical fixture time (acrylic)* | Low power 4mW/cm <sup>2</sup> battery lamp: 10secs<br>LED 100mW/cm <sup>2</sup> lamp: 4 secs<br>UV light guide 30W/cm <sup>2</sup> : 2 secs |
| Cure wavelength                 | 365 - 420 nm**  |

\*The cure time depends on the power of the UV lamp, its spectral output, the distance between the lamp and the components, and the transmission characteristics of the substrates.

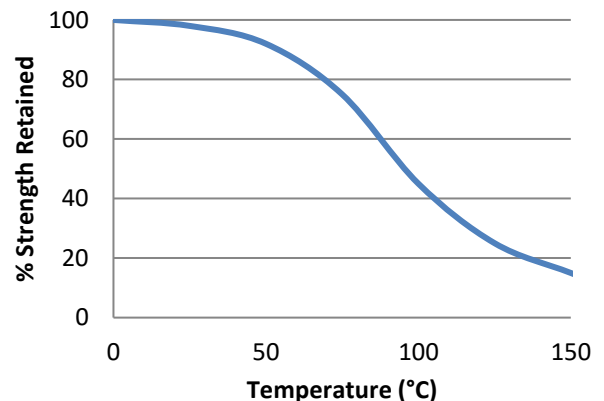
\*\*LED UV lamps have a narrow range of spectral output. It is important to check suitability with Permabond in order to match the LED lamp's peak wavelength with that of the adhesive's photoinitiator to ensure optimal adhesive cure.

### Typical Performance of Cured Adhesive

|  |  |
|--|--|
| Overlap shear strength (ISO4587)                     | Polycarbonate >9 N/mm <sup>2</sup> (>1300 psi)*<br>PVC >5 N/mm <sup>2</sup> (>700 psi)*<br>PC to ABS >7 N/mm <sup>2</sup> (>1000 psi)*<br>Acrylic >1.5 N/mm <sup>2</sup> (>220 psi)* |
| Tensile strength (ISO37)                             | 15 N/mm <sup>2</sup> (2200 psi)  |
| Refractive index                                     | 1.490  |
| Elongation at break (ISO37)                          | >70%   |
| Hardness (ISO868)                                    | 50-65 Shore D  |
| Dielectric strength                                  | 25-30 KV/mm  |
| Dielectric constant 1MHz@25°C                        | 4  |
| Water absorption (ISO62)<br>2 hours in boiling water | <5%  |

\*Substrate failure was observed

### Hot Strength



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

UV649 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 (-67°F) depending on the materials being bonded.

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.

## Additional Information

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

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. Particular care should be taken to remove silicone based cleaning agents which may have been used previously to clean glass.

Some metals such as aluminium, copper and its alloys, will benefit from light abrasion with emery cloth (or similar) to remove the oxide layer.

Isopropanol can be used to degrease most surfaces.

Where thermoplastic surfaces are involved we recommend tests are done to ensure compatibility, mold release agents may affect bond strength.

## Directions for Use

- 1) Adhesive can either be applied directly from the bottle or dispensed via automated dispensing equipment for more accurate dosing. Minimise exposure of product to ambient light.
- 2) It is important to try to prevent air entrapment within the joint as this could be detrimental to the finished appearance of the adhesive.
- 3) Parts should be firmly held and not disturbed during cure. Expose the joint to ultra-violet light for the appropriate time to ensure full cure. Cure time depends on the power of the UV lamp, its spectral output, the distance between the lamp and the components, and the transmission characteristics of the substrates.
- 4) For help selecting a suitable lamp and/or dispensing equipment, please contact the Permabond technical helpline.

## Video Link

UV adhesive directions for use:  
<https://youtu.be/Y9q0FGFhdvc>



## Other Products Available

### Anaerobics

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

### Cyanoacrylates

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

### Epoxies

- 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

## Storage & Handling

|   |                        |
|---|------------------------|
| Storage Temperature                         | 5 to 25°C (41 to 77°F) |
| Protect liquid adhesive from room lighting. |                        |

[www.permabond.com](http://www.permabond.com)

- UK: 0800 975 9800
- General Enquiries: +44 (0)1962 711661
- US: 732-868-1372
- Asia: + 86 21 5773 4913

[info.europe@permabond.com](mailto:info.europe@permabond.com)

[info.americas@permabond.com](mailto:info.americas@permabond.com)

[info.asia@permabond.com](mailto:info.asia@permabond.com)

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.