

### Features & Benefits

- Low hazards SDS
- High shear strength
- Fast curing with low-power lamps
- 100% solids, no solvents
- Excellent adhesion to plastics

### Description

**PERMABOND® UV645M** is a single-part, fast-setting UV-curable adhesive, designed specifically for bonding plastics. This material has excellent adhesion to a variety of plastics, including polycarbonate. UV645M has very high shear strength, elongation and impact resistance, making it ideal for applications that require substrates with different coefficients of thermal expansion. UV645M has good depth-of-cure abilities, making it suitable for use as a sealant.

### Typical Physical Properties of Uncured Adhesive

|                      |                                                                    |
|----------------------|--------------------------------------------------------------------|
| Chemical composition | Methacrylic ester                                                  |
| Appearance           | Colourless, clear                                                  |
| Viscosity @ 25°C     | 20rpm: 8,000-10,000 mPa.s (cP)<br>2.5rpm: 30,000-60,000 mPa.s (cP) |
| Specific Gravity     | 1.1                                                                |

### Typical Curing Properties

|                                 |                                                                                                                   |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Typical fixture time (acrylic)* | Low power 4mW/cm² battery lamp: 10 secs<br>LED 395 nm: 150mW/cm² lamp: 2 secs<br>UV light-guide 300mW/cm²: 2 secs |
| Cure wavelength                 | 365-420 nm**<br>Ideal with LED lamps at 395 nm for plastics                                                       |

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

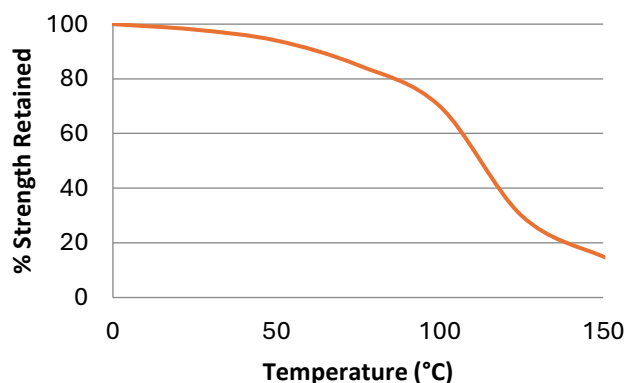
\*\*LED lamps have a narrow range of spectral output. It is important to check suitability with Permabond in order to match the LED lamp's peak wavelength with that of the adhesive's photoinitiator to ensure optimal adhesive cure.

### Typical Performance of Cured Adhesive

|                                                    |                                                                                                                                                                                                                           |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overlap shear strength (ISO 4587)                  | Polycarbonate >9 N/mm²* ( <b>&gt;1300 psi</b> )<br>PMMA >1.5 N/mm²* ( <b>&gt;220 psi</b> )<br>PVC >5 N/mm²* ( <b>&gt;725 psi</b> )<br>PC/ABS >7 N/mm²* ( <b>&gt;1015 psi</b> )<br>PET-G >7 N/mm²* ( <b>&gt;1015 psi</b> ) |
| Tensile strength (ISO 37)                          | 11 N/mm² ( <b>1600 psi</b> )                                                                                                                                                                                              |
| Refractive index                                   | >1.490                                                                                                                                                                                                                    |
| Tg (DMA)                                           | 62°C                                                                                                                                                                                                                      |
| Elongation at break (ISO 37)                       | >70%                                                                                                                                                                                                                      |
| Hardness (ISO 868)                                 | 50-65 Shore D                                                                                                                                                                                                             |
| Dielectric strength                                | 25-30 kV/mm                                                                                                                                                                                                               |
| Dielectric constant 1MHz@25°C                      | 4                                                                                                                                                                                                                         |
| Water absorption (ISO 62)<br>2 hours 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.

Permabond® UV645M can withstand higher temperatures for brief periods (such as for paint-baking and wave soldering processes) provided the joint is not unduly stressed.

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## Additional Information

This product is not recommended for use in contact with strong oxidising materials. Information regarding the safe handling of this material may be obtained from the Safety Datasheet. 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 Link

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



## Storage & Handling

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

## 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 an 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 performed to ensure compatibility; mould 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 the 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.

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