Technical data sheet

Product:	UV643
Manufacturer:	PERMABOND ENGINEERING ADHESIVES
Product group:	KLEBSTOFF
Article group:	UV- AUSHÄRTENDER KLEBSTOFF
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PERMABOND UV643

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PERMABOND® UV643

UV-Curable Adhesive

Provisional Technical Datasheet

Features & Benefits

- Excellent strength on PC, PVC, and other rigid plastics
- Tack-free surface cure
- Very quick cure at wavelengths from 365 to 420 nm, good on stabilized plastics
- Exceptional resistance to warm and humid conditions
- Excellent resistance to thermal cycles on plastic assemblies
- Resists yellowing

Description

PERMABOND® UV643 is a thixotropic, extremely fast UV-curable acrylic adhesive developed for the fast bonding of many rigid plastics, also in combination with metals. It cures tack-free and provides excellent performance on several thermoplastics including polycarbonate, PMMA PETG, PET, ABS, and rigid PVC. It also provides high durability when exposed to hot/wet conditions (i.e. tested at +85°C/85% RH).

Physical Properties of Uncured Adhesive

Chemical composition	Urethane acrylate
Appearance	Pale yellow (colourless when cured)
Viscosity @ 25°C	20rpm: 2000 mPa.s *(cP)* 2rpm: 17,600 mPa.s *(cP)*
Specific gravity	1.0

Typical Curing Properties

Typical fixture time (acrylic)*	Mercury short arc lamp 330 mW/cm²: <1 secs UV LED 400nm 150 mW/cm²: <1 secs UV LED 400nm 0.1m W/cm²: 19 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	Polycarbonate: 13 N/mm² *(1885 psi)** Acrylic: 7 N/mm² *(1015 psi)* PETG: 6 N/mm² *(870 psi)** PVC: 8 N/mm² *(1160 psi)** Aluminium to PC: 10 N/mm² *(1450 psi)* Mild steel to PC: 10 N/mm² *(1450 psi)*
Tensile strength (ASTM D638)	23 N/mm² *(3336 psi)*
Elongation at break (ASTM D638)	50%
Elastic modulus (ASTM D638)	1.2 GPa
Hardness (ISO868)	65 Shore D
Linear Shrinkage	1%
Tg (DMA, Tan delta)	83°C
Water absorbtion (ISO62)	24h at 23°C: 4% 2h in boiling water: 5%

**Substrate failure was observed*

Thermal Aging

The table below shows the shear strength retained after thermal aging. Lap shear specimens were prepared and cured at 23°C, aged at the indicated temperature, and tested at 23°C.

Thermal aging at 85°C/85% RH		
Substrate	Initial strength	After aging: 4 weeks
Polycarbonate	13 N/mm²*	13 N/mm²*
Aluminium to polycarbonate	10 N/mm²	13 N/mm²*

**Substrate failure was observed*

Thermal Cycling

The table below shows the shear strength retained after thermal cycling. Lap shear specimens were prepared and cured at 23°C, aged at the indicated temperature, and tested at 23°C.

Thermal cycles (-40+80°C +80%RH)		
Substrate	Initial strength	After aging: 1 week
Polycarbonate	13 N/mm²*	13 N/mm²*
Mild steel to polycarbonate	12 N/mm²*	8 N/mm²

**Substrate failure was observed*

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.
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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.	

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