PERMABOND® TA4551

Toughened Acrylic Adhesive

Provisional Technical Datasheet

Features & Benefits

- Low odour formulation
- Excellent adhesion on plastics, metals and composites
- 15 minutes open time
- Outstanding strength on unprepared materials
- High toughness

Description

PERMABOND® TA4551 is a two-part, 2:1 low odour acrylic adhesive. It has been developed for the structural bonding of some nylon/polyamide grades without the need for any primers or additional surface treatments. TA4551 is also good for bonding plastics, composites and metals, and cures rapidly at room temperature, whilst being thixotropic (non-slump), allowing for vertical application.
The adhesive is highly toughened, making it suitable for applications involving impact and vibration.

Typical Physical Properties of Uncured Adhesive

	TA4551 A-side	TA4551 B-side
Chemical composition	Acrylic	Acrylic
Colour	Burgundy	Yellow
Viscosity @ 25°C	20,000 mPa.s *(cP)* Thixotropic	50,000 mPa.s *(cP)* Thixotropic
Specific gravity	1.0	1.0

Typical Curing Properties

Ratio of use	2:1
Minimum† / Maximum gap fill	0.1 mm *(0.004 inch)* 5 mm *(0.2 inch)*
Pot life *(10g mix)* @23°C	10-15 mins
Open time @23°C	15 mins
Working strength *(0.3 N/mm2 shear is achieved)* @23°C	2-3 hours
Full cure @ 23°C	24 hours

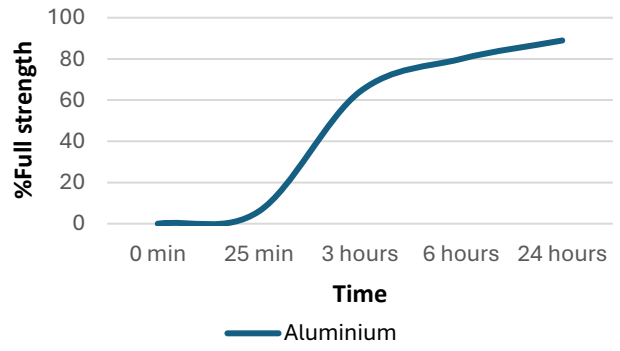
**Curing times on mild steel. †The adhesive incorporates microbeads, allowing for a controlled minimum gap.*

Typical Performance of Cured Adhesive

Shear strength† (ISO 4587)	PA6: 3-5 N/mm² *(440-580 psi)* PA6,6: 3-5 N/mm² *(440-730 psi)* PMMA: >4 N/mm² *(290-440 psi)** PVC: >4 N/mm² *(150-290 psi)** Polycarbonate: 3-4 N/mm² *(440-580 psi)* Epoxy FRP: >14 N/mm² *(>2030 psi)** Carbon Fibre: 18-22 N/mm² *(2610-3190 psi)* Stainless Steel: 30-32 N/mm² *(4350-4640 psi)* Aluminium: 26-35 N/mm² *(5080-5370 psi)* Aluminium: 23-27 N/mm² *(3340-3920 psi)*** Mild Steel: 23-27 N/mm² *(3340-3920 psi)* Galv steel: 15-17 N/mm² *(2180-2470 psi)***
Peel strength (aluminium) (ISO 4578)	308 N/25mm *(70 PIW)*
Impact strength (ASTM D-950)	66 KJ/cm²
Hardness (ISO 868)	65 Shore D
Tg (DMA)	65°C
Tensile strength (ASTM D638)	14 MPa
Elongation at break (ASTM D-638)	100%
E-modulus (ASTM D638)	350 MPa
Water absorption (24h at 25°C)	0.7%

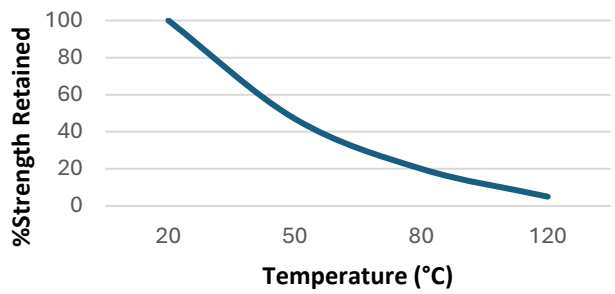
**Substrate failure was observed. **Unprepared.*
†Nature of surface, surface preparation, glue-line thickness, thickness of substrates, pull speed, batch variation, cure time and temperature will all affect the shear strength measurement.

Strength Development



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

Hot Strength



"Hot strength" shear strength tests performed on aluminium. 24-hour cure at room-temperature and conditioned for 30 minutes before testing.

Permabond® TA4551 can withstand higher temperatures for brief periods (such as for paint-baking and wave-soldering processes) provided the joint is not unduly stressed.

Chemical Resistance

Lap shear specimens aged and tested at room temperature		
Environment	**500h**	**1000h**
85°C/85% RH	Aluminium 100%	Aluminium 86%
IPA @+25°C	Aluminium 71%	Aluminium 62%
Gasoline @+25°C	Aluminium 103%	Aluminium 92%
Motor Oil @+25°C	Aluminium 88%	Aluminium 96%

Additional Information

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

Video Links

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

Structural acrylic directions for use:
https://youtu.be/j4Ou9acBtmc

Storage & Handling

Storage Temperature	12 to 25°C ***(54 to 77°F)***

Surface Preparation

Surfaces should be clean, dry and grease-free before applying the adhesive. Surfaces may have traces of mould 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 an 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 feel soft due to air contact. Adhesive inside the joint will cure solid.

This Technical Datasheet (TDS) offers guideline information and does not constitute a specification.

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