PERMABOND® TA4204

Toughened Acrylic Adhesive

Technical Datasheet

Features & Benefits

- Adhesion to a wide variety of substrates
- Fast cure at room temperature
- Can be used with or without nozzle
- High shear and peel strength
- Good impact strength
- Good chemical resistance
- Crystal clear appearance
- Bonds well to unprepared aluminium

Description

PERMABOND® TA4204 is a 2-part, 1:1 toughened acrylic adhesive. It can be used to bond a wide variety of materials including metals, plastics, GRP, ceramics, wood and other substrates. It is convenient to use in an easy-to-dispense cartridge or it can be used bead on bead without a mixing nozzle.

Physical Properties of Uncured Adhesive

	TA4204 A	**TA4204 B**
Chemical composition	Methyl methacrylate	Methyl methacrylate
Colour	Clear, colourless	Clear, colourless
Mixed colour	Clear, colourless	
Viscosity @ 25°C	100,000 mPa.s *(cP)* Thixotropic gel	10,000 mPa.s *(cP)*
Specific gravity	1.0	1.0

Typical Curing Properties

Ratio of use	1 : 1
Maximum gap fill	3 mm *(0.12 in)*
Fixture time @23°C	1-2 minutes
Handling time *(0.3 N/mm² shear strength is achieved)* @23°C	5-10 minutes
Working strength @23°C	20-25 minutes
Full cure @23°C	24 hours

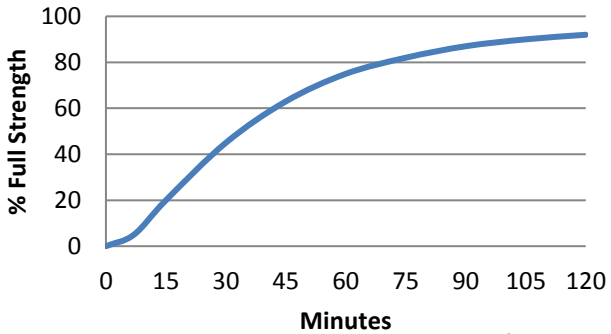
Typical Performance of Cured Adhesive

Shear strength* (ISO4587)	PMMA: 4-5 N/mm² *(580-725 psi)* SF* Aluminium (gritblasted) 15-17 N/mm² *(2200-2500 psi)* Aluminium (as received) 12-14 N/mm² *(1700-2000 psi)* Steel: 18-20 N/mm² *(2600-2900 psi)* Carbon fibre: 21-23 N/mm² *(3000-3300 psi)* ABS: 3-5 N/mm² *(435-725 psi)* SF* PC: 2-4 N/mm² *(290-580 psi)* Epoxy FRP: 11-13 N/mm² *(1600-1900 psi)* PVC: 4-6 N/mm² *(580-870 psi)* SF* Polyester GRP: 6-8 N/mm² *(870-1160 psi)* Hot dip galv steel: 14-17 N/mm² *(2000-2500 psi)* Glass to glass 9-10 N/mm² *(1300-1450 psi)* Glass to aluminium: 13-14 N/mm² *(1900-2000 psi)* Glass to steel: 15-16 N/mm² *(2200-2300 psi)*
Peel strength (ISO4578)	50 N/25mm *(11 PIW)*
Hardness (ISO868)	50-60 Shore D
Coefficient of thermal expansion (ASTM D-696)	80 x 10^{-6} 1/K
Thermal conductivity (ASTM C-177)	0.1 W/(m.K)
Dielectric constant (ASTM D-150)	4.6 MHz
Dielectric strength (ASTM D-149)	30-50 kV/mm
Volume resistivity (ASTM D-257)	2 x 10^{13} Ohm.cm

**Strength results will vary depending on the level of surface preparation and gap. If using a cleaning solvent, allow 3-4 minutes to fully evaporate before applying adhesive.*

SF* = Substrate failure

Strength Development

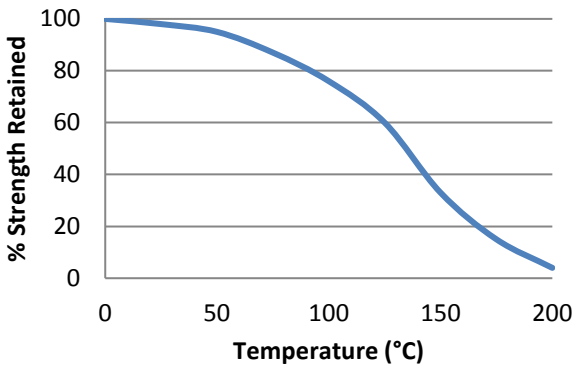


Graph shows typical strength development of bonded components at 23°C. Curing at higher or lower temperatures may affect cure speed.

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.

Hot Strength



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

TA4204 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 -40°C (-40°F) 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.

Storage & Handling

Storage Temperature	2 to 7°C ***(35 to 45°F)***

Surface Preparation

Surfaces should be clean, dry and grease-free before applying the adhesive. Permabond Cleaner A is recommended for the degreasing of most surfaces. 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. If using a cleaning solvent, allow 3-4 minutes to fully evaporate before applying adhesive.
2) Apply a thin bead of adhesive pre-mixed through a static mixer nozzle. If no mixing nozzle is being used, make sure one component is extruded on top of each other (not side by side).
3) Alternatively apply a thin layer of resin on one component and hardener on the other.
4) Assemble components and clamp.
5) Maintain pressure until handling strength is achieved. The time required will vary according to the joint design and surfaces being bonded.
6) Allow 24 hours for adhesive to fully cure. Accelerated cure times may be achieved by heating.

Video Links

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

Structural acrylic directions for use:
https://youtu.be/edvBe4iYNCY

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
info.americas@permabond.com
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.