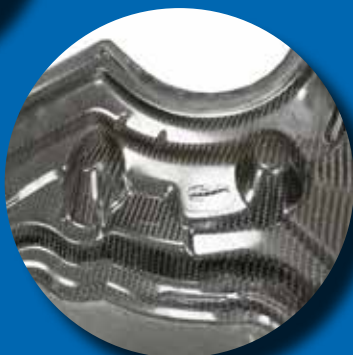
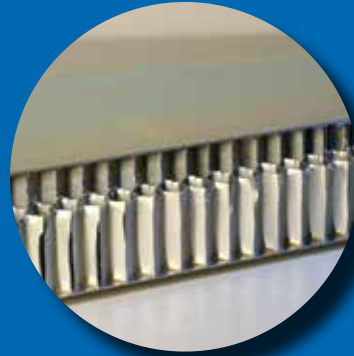


Adhesives for Composites



Permabond[®]
Engineering Adhesives

www.permabond.com

Bonding Dissimilar Materials:



PermaBond adhesives can bond a wide variety of substrate materials including: Thermoplastics such as:

- ABS
- Acrylic
- PVC & UPVC
- Vinyl
- Nylon
- Polycarbonate
- Polystyrene
- PEEK etc.

and thermoset resins such as:

- Epoxy
- Polyurethane
- Phenolic impregnated materials
- Fibreglass / fibre reinforced plastic
- GRP, CFRP, Gelcoat
- Sheet moulding compound (SMC)
- Various types of moulding resin

PermaBond adhesives are also suitable for use on metal, rubber, wood, carbon fibre, laminate, concrete and silicone. Please check with PermaBond which adhesive is suitable for your materials.

Application: Bonding marble honeycomb panels

- Bonding thin marble sections to honeycomb composite for use as worksurfaces in kitchens and bathrooms on yachts, motor homes, caravans and aeroplanes.

■ If colour-matched product is required, PermaBond's chemists can produce custom formulations.

Adhesive used: PermaBond ET5429



PermaBond offers a wide range of different adhesive technologies for bonding composites. Whether you require a rapid cure in seconds or several hours to assemble parts, PermaBond can help you find a bonding solution.

Existing PermaBond adhesive users already enjoy many of the following benefits over mechanical fasteners:

- Cost savings
- Component weight reduction
- Improved stress distribution
- Improved appearance
- Faster manufacturing process
- Eliminates pre-drilling & prevents leaks
- Helps prevent corrosion
- Wider choice of substrate materials
- Better noise and vibration absorption
- Low shrinkage = no show-through marks



PermaBond bonds composites in many industry sectors:

- Aerospace
- Automotive
- Boat Building
- Buildings
- Buses
- Partitioning
- Shopfitting
- Sports Equipment
- Street Furniture
- Trains & Trams
- Wind Turbines



PermaBond ET500 is used to bond fasteners to a carbon fibre car bonnet and PermaBond PT326 bonds the 2 skins of a carbon fibre car bonnet together.



Application: Bonding aircraft seat trays

Bonding ABS, plastic laminate and aluminium seat tray construction together. ET515 was selected due to its excellent impact and vibration resistance, quick cure and most importantly it doesn't attack any of the sensitive substrate materials.

Benefits of PermaBond ET515

- Rapid-curing
- Non-flammable
- Flexible, good impact resistance
- Easy application process
- Clear appearance gives an aesthetically good finish.

Adhesive used: PermaBond ET515



Product Name	Colour	Features	Cure method	Viscosity (mPa.s)	Gap fill (mm)	Cure Speed	Shear strength (MPa)	Peel strength (Aluminium) (N/25mm)
PermaBond 737	Black	Cyanoacrylate instant adhesive with rubber toughening.	1-part moisture cure	2,000-4,000 mPa.s	0.5	Handling time: 5-35 seconds	Steel: 19-23 FRP Glass/Epoxy: 9 Carbon Fibre: 6	40-60
PermaBond ES569	Black	Thick black epoxy paste, ideal for bonding carbon fibre where vertical application or gap filling is required.	1-part heat cure	250,000-500,000 Thixotropic Paste	5.0	Full strength 60 mins at 150°C	Steel: 27-41 FRP Glass/Polyester: N/A FRP Glass/Epoxy: 9-11 Carbon Fibre: 10-12	100-120
PermaBond ES5681	Black	Single part epoxy for the high strength bonding of carbon fibre or FRP/GRP	1-part heat cure	40,000-60,000	0.5	Full strength 35 minutes at 135°C	Steel: 30-35 FRP Glass/Polyester: 3-5 FRP Glass/Epoxy: 14-16 Carbon Fibre: 18-22	180-200
PermaBond ET515	Clear/colourless	Flexible epoxy with excellent impact and vibration resistance. Ideal for use on sensitive composites (such as foams).	2-part 1:1 mix ratio room temperature cure. Cure can be accelerated by using heat.	Mixed: 12,000-22,000	2.0	At 23°C Handling time: 20-30 mins Full strength: 72 hrs	Steel: 8-12 FRP Glass/Polyester: 3-5 FRP Glass/Epoxy: 4-6 Carbon Fibre: 4-6	70-90
PermaBond ET5401	Grey	High temperature resistant epoxy. Ideal for applications where clamping or jiggging during heat cure is not possible.	2-part 2:1 mix ratio room temperature cure. Full strength achieved by post-curing by heat	Thixotropic paste	5.0	At 23°C Handling time: 60-90 mins Full strength: 1 hour at 80°C	Steel: 20-30 FRP Glass/Polyester: 6-8 FRP Glass/Epoxy: 19-23 Carbon Fibre: 22-24 (all cured 1 hr @ 80°C)	140-160 (cured 1hr at 80°C)
PermaBond ET5428	Charcoal-black or cream version available*	Toughened epoxy with rapid strength development.	2-part 2:1 mix ratio room temperature cure. Cure can be accelerated by using heat.	Thixotropic paste	5.0	At 23°C Handling time: 30-45 mins Full strength: 24-48 hrs	Steel: 18-22 FRP Glass/Polyester: 6-9 FRP Glass/Epoxy: 24-28 Carbon Fibre: 20-38	150-250
PermaBond ET5429	Charcoal black	Toughened epoxy ideal for applications where high temperatures may be experienced.	2-part 2:1 mix ratio room temperature cure. Cure can be accelerated by using heat.	Thixotropic paste	5.0	At 23°C Handling time: 6-10 hours Full strength: 72 hours	Steel: 18-22 FRP Glass/Polyester: 7-10 FRP Glass/Epoxy: 14-18 Carbon Fibre: 20-37	150-230
PermaBond MT382	Charcoal black	Low viscosity, self levelling, soft, slightly flexible modified epoxy product.	2-part 2:1 mix ratio room temperature cure. Cure can be accelerated by using heat.	Mixed: 13,000-30,000	0.5	At 23°C Handling time: 105-120 mins Full strength: 72 hours	Steel: 4-7 FRP Glass/Polyester: 5-7 FRP Glass/Epoxy: 5-7 Carbon Fibre: 6-8	140-160
PermaBond MT3821	Charcoal black	Highly flexible modified epoxy adhesive with excellent adhesion to a wide variety of substrates and Shore A hardness of 50.	2-part 2:1 mix ratio room temperature cure. Cure can be accelerated by using heat.	Thixotropic paste	5.0	At 23°C Handling time: 60-90 mins Full strength: 72 hours	Steel: 4-7 FRP Glass/Polyester: 5-7 FRP Glass/Epoxy: 5-7 Carbon Fibre: 6-8	140-160
PermaBond PT326	Grey	2-Part polyurethane adhesive ideal for bonding composites such as carbon fibre and interior trim	2-part 1:1 room temperature cure	Mixed: 3500-7000	5.0	At 23°C Handling time: 60-90 mins Full strength 4-5 days	Steel: 12-20 FRP Glass/Polyester: 5-7 FRP Glass/Epoxy: 12-14 Carbon Fibre: 9-11	150-170
PermaBond PT328	Grey	As PT326 but with longer pot life.	2-part 1:1 room temperature cure	Mixed: 3500-7000	5.0	At 23°C Handling time: 90-120 mins Full strength 4-5 days	Steel: 12-18 FRP Glass/Polyester: 5-7 FRP Glass/Epoxy: 12-14 Carbon Fibre: 9-11	150-170
PermaBond TA4246	Amber	Toughened, rapid cure, good adhesion to a wide variety of surfaces.	2-part acrylic with brush on initiator and separate resin	23,000	0.5	At 23°C Handling time: 2-4 mins Full strength: 24 hours	Steel: 33-35 FRP Glass/Polyester: 6-8 FRP Glass/Epoxy: 9-11 Carbon Fibre: 18-22	150-180
PermaBond TA4210	Cream	Toughened, gap filling, 1:1 mix ratio, easy to apply. Ideal for bonding clips, hinges and brackets.	2-part pre-mix acrylic (cartridge and mixing nozzle system) room temperature cure	Mixed: 45,000	4.0	At 23°C Handling time: 30-35 mins Full strength: 24 hours	Steel: 23-25 FRP Glass/Polyester: 5-7 FRP Glass/Epoxy: 9-11 Carbon Fibre: 14-16	200-300

*May be subject to minimum order quantities

For full technical details, please refer to our technical datasheets available at www.permabond.com.

This is just a small selection of products that PermaBond has to offer. We have an extensive range of different products and the ability to custom formulate (free of charge) to match your specific requirements.

Adhesives for • Design • Manufacturing • Assembly • Maintenance • Repair & Overhaul

Permabond's history of developing and manufacturing engineering adhesives spans **four decades** and three continents. Today, Permabond Engineering Adhesives Ltd (Europe & Asia) and Permabond LLC (Americas) provide technological solutions to engineers all over the world, with offices and facilities in America, Asia and Europe, backed by a high-tech **ISO 9001** certified production plant in Europe.



- **Technical** – Our chemists and technicians are available to provide application assistance, custom formulation, in-house prototype testing, joint product development programs and much more.
- **Training** – Permabond's knowledgeable sales group will provide your staff with the information they need to maximize the efficiencies, cost savings, and safety benefits Permabond products generate.
- **Sales** – From preliminary project appraisals and product needs assessments through to process reliability analysis, Permabond's knowledgeable sales group will support you from product concept through to production.

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