

CRESTABOND® PP-04

Primerless MMA Structural Adhesives

Technical Data Sheet



Introduction

Crestabond® PP-04 is designed to structurally bond low surface energy substrates such as polypropylene (PP), polyethylene (PE) and other difficult to bond plastics, commonly known as thermoplastic polyolefins (TPO). Such plastics repel rather than attract adhesion due to their non-polar, non-porous and chemically inert surfaces. Crestabond® PP-04 will bond these materials without surface treatment

Features and Benefits

Structural bonding of polyolefins	▶	Replaces mechanical fasteners / plastic welding
Primerless application, no pre-treatment	▶	No need for extra materials or processes
Excellent adhesion to dissimilar substrates	▶	Affords greater flexibility in design
High strength, modulus and toughness	▶	Designed for demanding structural applications
Excellent environmental resistance	▶	Designed for demanding environmental applications

Application Properties	
Working Time ¹	3 – 5 Minutes.
Fixture Time ² @ 23°C	165 – 180 minutes*
Fixture Time ² @ 50°C	80 – 100 minutes**
Gap Filling	0.5 – 5 mm (0.02-0.2 inch)
Mixed Colour	Off White
Recommended Application Temperature	18 - 25°C (64 - 77°F)

Mechanical Properties	
Tensile Strength ³	12 - 17 MPa (1.7 - 2.4 ksi)
Tensile Modulus ³	800 - 1200 MPa (116 - 174 ksi)
Tensile Elongation ³	2 - 5%
Aluminium Lap shear ⁴	16 - 18 MPa (2.3 – 2.6 ksi)
Recommended Operating Temperature ⁵	-40 - 100°C (-40 - 212°F)

Liquid Properties		
Product	PP-04 Adhesive	PP-04 Activator
Viscosity ⁶	70,000 – 110,000 cP* 80-200 & 500-2000 dPa.s**	100,000 - 140,000 cP* 100-200 & 600-2000 dPa.s**
Specific Gravity	0.98 - 1.00 g/cc	0.97 – 0.99 g/cc
Mix Ratio (by volume)	1	1
Mix Ratio (by weight)	1	1
Colour	Off white	Translucent
Shelf Life ⁷	9 months	9 months

Substrates

	Recommended Substrates (Lap Shear Strength MPa ⁶)	Non - Recommended Substrates
Plastics	Acrylic ¹⁰ 18 - 22 MPa PVC ⁸ 13 - 15 MPa ABS ⁸ 13 - 15 MPa PP ⁸ 13 - 18 MPa PE ⁸ 13 - 18 MPa HDPE ⁸ 11 - 13 MPa LDPE ⁸ 6 - 8 MPa PP-LGF40 ⁸ 6 - 8 MPa PP-20TF ⁸ 5 - 7 MPa Other: Styrenics	-
Metals	Aluminium ⁹ 16 - 18 MPa CRS ⁹ 12 - 15 MPa Other: Carbon Steel	Zinc / Galvanised Coated Metals, Copper
Composites	GRP/FRP ⁸ 6 - 8 MPa	-

Please contact Scott Bader technical services for information and advice on other substrates

Surface Preparation

The surface to be bonded can affect the strength and durability of the bond joint. Appropriate treatment may be required to ensure that there are no traces of oil, grease, dirt or release agents through the use of a degreasing agent, for instance acetone or another degreasing agent on the joint surfaces.

Mechanically abrading or chemically etching degreased surfaces can make bond joints more durable and stronger. If abrading, a second treatment of degreasing is highly recommended.

Do not use petrol (gasoline), low grade alcohol or paint thinners.

i) Metals

Typically, the surface should be clean and dry by using an alcohol/solvent wipe and allowing the solvent to evaporate before application. Certain metals, such as carbon steel may also require mechanical abrasion and a subsequent alcohol solvent wipe prior to bonding.

ii) Thermoplastics

The surface must be clean, dust-free and dry. A suitable solvent such as iso-propanol can be used to degrease.

iii) Composites

The surface must be clean, dust-free and dry. This can be achieved by the use of proprietary strippable cloths such as peel-ply (without lubricant contaminates). The laminate should be fully cured prior to bonding and if the laminate surfaces are more than 3 days old, it is recommended that the surface must be cleaned with a suitable solvent or cleaner with a lint-free, clean cloth prior to bonding.

Surface preparation, such as mechanical abrasion, is likely to be needed on gel coat surfaces and moulded surfaces where release agents are likely to be present. When bonding epoxy laminates please test bond strength prior to application.

Application

Prior to bonding, ensure the substrate surface is clean by following the surface preparation instructions provided. Bulk dispensing equipment should be in good operating condition. Dispense the adhesive at a slow rate initially onto a nonbonding surface until the mixed bead colour is uniform. Check the dispensed bead for cure quality before beginning the bonding process.

Dispense enough adhesive to fill the bond gap before parts are mated. Avoid dry bonds by using adequate pressure to mate parts and clamp properly to prevent joint movement. The working time is the approximate time after mixing that the adhesive is still usable. The bonding process must be completed before the working time of the mixed adhesive expires. Crestabond PP-04 can be used directly from the fridge however in order to achieve working and fixture time values similar to those given in this TDS the parts must be allowed to reach workshop temperatures of between 18°C and 25°C (64°F and 77°F) prior to bonding. The application temperature should be maintained during the bonding process and until the adhesive is sufficiently cured to allow movement of the assembly. Typically, such movement may be possible after the fixture time of the adhesive is achieved. Ambient temperature, bondline thickness and the substrate materials being bonded can all affect the fixture time.

To reduce the fixture time to approximately 90 minutes, bond the parts as above at room temperature and leave for 5 minutes. The mated parts can then be placed into an oven at 50°C (154°F) maximum for 90 minutes.

For industrial/commercial use only. Not to be used in household applications. The user must determine the suitability of a selected adhesive for a given substrate and application. Contact your local Scott Bader representative for questions or assistance with the selection of adhesives for your use. This product is intended for use by skilled individuals at their own risk. Recommendations contained herein are based on information we believe to be reliable.

Storage and Shelf Life

The shelf life of Crestabond[®] PP-04 is defined from the date of manufacture when stored in a fridge between 5°C and 8°C (41°F and 46°F). Exposure to temperatures above 8°C (46°F) should be avoided as the product will thicken and become unusable. Must be transported temperature controlled. It is highly recommended that the product should never be frozen.

Crestabond products should be stored in their original container out of direct sunlight. The bulk product or cartridge material should be opened only immediately prior to use. The expiry date is indicated on the product label.

Packaging

Crestabond[®] PP-04 is supplied in pre-packed 50ml and 400ml side by side cartridges.

Health and Safety

See separate Material Safety Data Sheet

1. Working time measured with 10g mass of adhesive with 1:1 mix ratio by volume at 24°C (75°F).	2. Fixture time defined using an ISO 4587 lap shear sample, 0.26mm bondline thickness with 23°C (73°F)* and 50°C (122°F)** ambient temperature achieving >1.4MPa.
3. Tested to ASTM D638.	4. Metals tested according to ISO 4587, Thermoplastics according to ASTM 2564 and GRP according to ASTM 5868.
5. Maximum temperature where an ISO 4587 lap shear sample, 0.26mm bondline thickness achieves >3MPa.	6. Viscosity measured using a Cone and Plate Viscometer at 24°C (75°F)* Viscosity measured using HAKKE RV1 Rheometer at 25°C (77°F)**
7. Shelf life defined from date of manufacture when stored as recommended.	8. Substrate failure when tested.
9. Adhesive failure when tested.	10. Cohesive failure when tested.
11. Surface preparation of epoxy laminates may be necessary and testing should be performed to ensure sufficient bond strength is achieved.	12. Surface preparation is likely to be needed on gelcoat surfaces to ensure no release agents are present.

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