

CRESTABOND® M1-04SL

Primerless MMA Structural Adhesives

Technical Data Sheet



Introduction

Crestabond® M1-04SL is a toughened, two component 10:1 acrylic adhesive designed for bonding composites, thermoplastics and metals. This new generation of structural methacrylate adhesive meets the bonding requirements of most assembly operations. Demonstrating excellent impact, peel, shear, compressive strength, and fatigue resistance properties across all bonded parts.

Features and Benefits

Primerless application	▶	No need for extra materials or processes
Excellent adhesion to dissimilar substrates	▶	Affords greater flexibility in design
Fast setting and curing	▶	Speeds up assembly process
High strength, modulus and toughness	▶	Designed for demanding structural applications
Excellent environmental resistance	▶	Designed for demanding environmental applications
Excellent shock and vibration resistance	▶	Suitable for bonding applications in heavy duty batteries
Self-Levelling rheology	▶	Suitable for cell bonding and encapsulation

Application Properties		Mechanical Properties	
Working Time ¹	4 – 7 Minutes.	Tensile Strength ³	16 - 20 MPa (2.3 – 2.9 ksi)
Fixture Time ²	10 – 12 Minutes.	Tensile Modulus ³	600 - 1000 MPa (87 - 145 ksi)
Gap Filling	1 – 5 mm (0.04-0.2 inch)	Tensile Elongation ³	>40%
Mixed Colour	Grey	Aluminium Lap shear ⁴	22 - 27 MPa (3.2 – 3.9 ksi)
Recommended Application Temperature	18 - 25°C (64 - 77°F)	Recommended Operating Temperature ⁵	-40 - 100°C (-40 - 212°F)

Liquid Properties		
Product	M1-04SL Adhesive	Activator 4
Viscosity ⁶	35-150 & 100-450 dPa.s	100-300 & 300-1000 dPa.s
Specific Gravity	0.96 - 1.02 g/cc	1.05 - 1.15 g/cc
Mix Ratio (by volume)	10	1
Mix Ratio (by weight)	9	1
Colour	Off white	Black
Shelf Life ⁷	12 months	12 months

Substrates

	Recommended Substrates (Lap shear Strength MPa ⁴)	Non - Recommended Substrates
Plastics	Acrylic ⁸ 20 – 24 MPa PVC ⁸ 16 – 20 MPa ABS ⁸ 13 – 17 MPa Other: Urethanes and common engineering thermoplastics	Low Surface Energy Plastics e.g. PP, PE & PTFE (use Crestabond PP-04)
Metals	Stainless ⁹ 13 – 17 MPa CRS ⁹ 13 – 17 MPa Aluminium ⁹ 17 - 21 MPa Other: Powder Coated Metals, Carbon Steel	Zinc/ Galvanised Coated Metals, Copper
Composites	GRP/FRP ⁸ 8 – 12 MPa Carbon Fibre/ Polyester DCPD Modified Vinyl Esters Epoxy ¹⁰ Gelcoats ¹¹	-

Please contact Scott Bader technical support 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 non-bonding 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. The viscosities of both adhesive and activator are affected by temperature. The adhesive, activator and parts to be bonded should be allowed to attain workshop temperature of between 18°C and 25°C (64°F and 77°F) prior to bonding. The operating 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.

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 product is defined from date of manufacture when stored in the original packaging, out of direct sunlight and at a consistent temperature between 2°C and 23°C (36°F and 73°F). The expiry date is indicated on the product labels.

Exposure to temperatures above 23°C (36°F) will reduce the shelf life of the product. To achieve the maximum shelf life it is highly recommended that these products are cold stored, ideally between 2°C and 10°C (36°F and 50°F). This ensures optimal and consistent product performance throughout the stated shelf life and provides protection to the product when exposed to short periods of unfavourable temperature conditions experienced in the supply chain. These products do not require protection from freezing however care must be taken to allow the material to slowly recondition to workshop temperatures. The use of warm air blowers or heated jackets must be strictly avoided as they can cause extreme localised heating, leading to a complete loss of reactivity, gelling and/ or impact to mechanical performance.

Bulk product and cartridge material should be opened only immediately prior to use.

Packaging

Crestabond M1-04SL is supplied in 18Kg (40 lb) plastic pails, 180Kg (397 lb) drums, pre-packed 400ml co-axial cartridges, 50ml and 490ml side by side cartridges.

Health and Safety

See separate Material Safety Data Sheet.

1. Working time measured with 9g mass of adhesive with 8.6:1 mix ratio by volume at 24°C (75°F).	2. Fixture time defined with 23°C (73°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 ASTM 5868.
5. Maximum temperature where an ISO 4587 lap shear sample, 0.26mm bondline thickness achieves >3MPa.	6. 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. Cohesive failure when tested.	10. Surface preparation of epoxy laminates may be necessary and testing should be performed to ensure sufficient bond strength is achieved.
11. Surface preparation is likely to be needed on gelcoat surfaces to ensure no release agents are present.	

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