SCIGRIP® SMARTER ADHESIVE SOLUTIONS

TECHNICAL DATA SHEET

SG5000 Series

Methacrylate Adhesives

DESCRIPTION

SCIGRIP® SG5000 Series Methacrylate Adhesives are high strength two-component products for bonding metals[2], plastics[1] and composites. They offer a unique combination of convenient 1:1 mix ratio and ability to adhere to a wide variety of materials. Most metals, including steel and aluminium, can be bonded without surface pretreatment. A choice of 3, 6 and 15 minute working times, fast cure and rapid strength build make this series of adhesives an ideal first choice for diverse bonding applications. Packaging options include 50 and 400 ml cartridges and in 19 and 189 litres (5 and 50 gallon) bulk containers for application with meter-mix dispense equipment.

PERFORMANCE BENEFITS

• **Primerless metal bonding for most metals**	**Eliminates surface treatment steps**
• **Choice of 3, 6 and 15 minute working times**	**Selection to fit process requirements**
• **Non critical 1:1 mix ratio**	**Excellent results with manual or metered mixing**
• **Excellent environmental & chemical resistance**	**Permanent bonds in harsh environments**
• **Minimal surface preparation**	**Offers clean shop and speedy assembly process**

TYPICAL ADHESIVE CHARACTERISTICS @ 24°C (75°F)

Characteristics	Part A (Adhesive)	Part B (Activator)	Mix (Part A + B)
Colour	Amber	Amber or Black	Amber or Black
Mix ratio by volume	1	1	—
Mix ratio by weight	1	1	—
Density, g/cc	0.96	0.97	0.97
Density, lb/gallon	8.01	8.09	8.09
Viscosity, cps	90,000 – 150,000	150,000 – 250,000	—

TYPICAL PHYSICAL PROPERTIES @ 24°C (75°F)

Tensile Strength MPa (psi)	35 – 40 (5,076 – 5,802)	Lap Shear Strength[4] MPa (psi)	18 – 25 (2,611 – 3,626)
Maximum Tensile Elongation (%)	5 – 10	Service Temperatures °C (°F)	-40 to 100 (-40 to 212)
Tensile Modulus[3] MPa (psi)	1,100 – 1,240 (160,000 – 180,000)		

RECOMMENDED SUBSTRATES

Composites	Metals[2]	Thermoplastics[1]
✓ Epoxy laminates	✓ Aluminium	✓ ABS, Acrylics
✓ FRP (Polyester / Vinyl Ester)	✓ Carbon Steel	✓ Vinyl
✓ Gelcoats	✓ Stainless Steel	✓ PVC, Polycarbonates

PRODUCT PROPERTIES @ 24°C (75°F) – Fixture Time (time to achieve 70% of ultimate strength in lap shear)[4]

Cartridge	Adhesive / Activator	Working Time (minutes)	Fixture Time (minutes)
SG5000-03	SG5000-03A / SG5000-03B	2 – 5	6 – 8
SG5000-06	SG5000-06A / SG5000-06B	5 – 8	10 – 12
SG5000-13	SG5000-13A / SG5000-13B	14 – 19	20 – 25

NOTES:

1. Polyolefins, thermoplastic polyesters, fluorocarbon plastics and other low surface energy plastics are generally not bondable.
2. Prepare metal by removing dust, loose scale, rust and other surface residue including oil and grease. For maximum bond strength on steel, abrade surface prior to bonding. See important notes a, b and c on reverse side.
3. Tensile modulus as measured in the linear portion of the stress strain curve.
4. Lap shear strength of unprimed aluminium to aluminium bond based on ASTM D1002 method.

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SAFETY AND HANDLING

Read Material Safety Data Sheet before handling or using this product. Adhesive components A and B contain methyl methacrylate monomer and are flammable. Always use in a well-ventilated area. Floor-level extraction and large quantities of moving air greatly facilitate ventilation. Both materials must be stored in a cool place away from sources of heat and open flames or sparks. Keep containers closed when not in use. Prevent contact with skin and eyes. In case of skin contact, wash with soap and water. In case of eye contact, flush with water for 15 minutes and seek immediate medical attention. Harmful if swallowed. Keep out of reach of children.

MIXING AND APPLICATION

EXOTHERM: The chemical curing reaction that occurs when components A and B are mixed generates heat. The amount of heat generated is dependent on the mass and thickness of the mixed product. Large masses over 39 mm (1.5 inch) thick can develop heat in excess of 121°C (250°F) and can generate vapours that should be avoided from direct personal contact.

CURING

Open working time is the approximate time after mixing components A and B, depending on bonding conditions, that the adhesive remains fluid and bondable. Fixture time is the approximate time after mixing components A and B required for the adhesive to react the partial state of cure necessary to allow careful movement, unclamping or de-molding of assembled parts. Parts can generally be put in service when 80 percent of full strength is developed. The time to achieve 80% cure is approximately 2-3 times that required for fixturing. The working and fixture times presented in this bulletin are based on laboratory tests performed at 24°C (75°F). Higher temperatures speed the curing reaction and reduce open working time. The reverse is true for lower temperatures. If significant variation in temperatures or application at very high or low temperatures is anticipated, contact your SCIGRIP representative for technical assistance.

DISPENSING EQUIPMENT

Dispensing from disposable cartridges or meter-mix dispense equipment is highly recommended. Both methods employ convenient static motionless mixer technology. Product supplied in pre-measured cartridges is dispensed from approved manual or pneumatic powered guns. While using pneumatic dispensing guns, it is mandatory to use the gun's regulator to regulate the air pressure. Manufacturers recommended maximum operating pressure and maximum compressed air supply pressure are 5.9 and 8.3 bars (85 and 120 psi) respectively. Removal of the regulator from the dispensing unit can lead to over pressurizing and rupture of the cartridge cylinder. Contact your SCIGRIP representative for information and availability.

When meter-mix dispense systems are used, care must be taken to assure compatibility between the adhesive components and the materials in the equipment that they contact. All wetted metal components should be constructed of stainless steel, aluminium or a sufficient thickness of chemically resistant material that prevents contact between the adhesive components and the base metal. Contact with copper, brass, zinc or alloys containing these materials must be strictly avoided. All nonmetallic seals and gaskets should be fabricated from PTFE, or polyethylene based materials. Natural rubber, nitrile rubber (BUNA), neoprene and Viton® are not acceptable.

APPLICATION

Follow instructions provided or contact your SCIGRIP representative for proper preparation of dispensing equipment and substrates prior to starting the bonding process. Always dispense a quantity of adhesive at start-up to assure that the adhesive exiting the tip of the mixer is the proper colour and is uniform, without streaks. If aged material is being used, allow the purged material to cure to assure quality before proceeding. Carefully dispense a sufficient quantity of adhesive on the substrate to assure that the bond gap is completely filled when the parts are mated. Allow for squeeze-out at the edges of the bond to assure filling. Carefully secure or clamp parts to prevent joint movement while the adhesive sets. Do not apply excessive pressure that can cause excessively thin gaps and starve the bond line. A minimum gap of 0.50 mm (0.02 inch) is recommended. If in doubt, use shims or spacers to set the gap. Test the curing adhesive at the edges for fingernail hardness before removing clamps or fixtures. Use a soft faring tool to remove excess adhesive from the bonded assembly. Masking tapes or other protective barriers should be used to prevent contamination on any cosmetically sensitive areas. Partially cured adhesive can be removed with a sharp knife and any cured adhesive may be removed by sanding or scraping.

CLEAN UP

Adhesive components and mixed adhesive should be removed from mixing and application equipment with a suitable industrial solvent or cleaner before the mixed adhesive cures. Once the adhesive cures, soaking in a strong solvent or paint remover will be required to soften the adhesive for removal. If the bonds are exposed to UV rays then use of plasticizers such as Benzoflex 2088 is recommended, or contact your SCIGRIP representative for additional information. Any clean-up of the bonded assembly using industrial solvents is not recommended as it could affect the cure.

STORAGE AND SHELF LIFE

The shelf life of components A and B in unopened containers is approximately six months from the date the product is shipped from SCIGRIP facilities. Shelf life is based on steady state storage between 13°C and 27°C (55°F and 80°F). Exposure, intermittent or prolonged, above 27°C (80°F) will result in a reduction of the stated shelf life. Exposures above 38ºC (100ºF) during shipping or storage can quickly degrade component B in cartridges or bulk containers, and must be prevented. Shelf life of both components can be extended by air-conditioned or refrigerated storage between 10°C and 18°C (50°F and 65°F). KEEP FROM FREEZING.

IMPORTANT NOTES

a. SUBSTRATE AND APPLICATION COMPATIBILITY: The user must determine the suitability of a selected adhesive for a given substrate and application. SCIGRIP strongly recommends laboratory, shop and end-use testing that simulates the actual manufacturing and end-use environment.

b. SURFACE PREPARATION: The need for surface preparation must be determined by comparative testing of prepared and unprepared substrates to assure that unprepared bonding is equivalent to or acceptable for the application relative to prepared bonding. Initial bonding tests must be followed up with simulated or actual durability tests to assure that surface conditions do not lead to degradation of the bond over time under service conditions. Subsequent changes in substrates or bonding conditions will require re-testing.

c. TECHNICAL ASSISTANCE: Contact your SCIGRIP representative for questions or assistance with the selection of adhesives and methods for evaluating adhesives for your intended application.

NOTE: *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. The properties and strength values presented above are typical properties obtained under controlled conditions at the SCIGRIP laboratory. They are intended to be used only as a guide for selection for end-use evaluation. The ultimate suitability for any intended application must be verified by the end user under anticipated test conditions. Since specific use, materials and product handling are not controlled by SCIGRIP, our warranty is limited to the replacement of defective SCIGRIP product.*

UL GREENGUARD
PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS
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GOLD

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