

SS1500 Series METHACRYLATE ADHESIVES

Preliminary Technical Data Sheet

Adhesives: SS1500A & SS1560A
Activators: SS1505B, SS1515B, SS1530B



DESCRIPTION

IPS WELD-ON® SS1500 series methacrylate adhesives are general purpose two-component products for bonding thermoplastics, composites and metals. They offer a unique combination of a convenient 1:1 mix ratio, adhesion to a wide variety of materials and high shear strength coupled with excellent toughness. Most materials, including steel and aluminum, can be bonded without priming^{1,2}. A choice of 5, 15, 30 and 60 minute working times, simple and convenient application, fast cure, high strength and toughness make the SS1500 series an ideal first choice for diverse bonding applications. SS1500 products are offered in 50 and 400 ml cartridges and in 5 or 50-gallon bulk containers for use with meter-mix dispensing equipment.

PERFORMANCE HIGHLIGHTS

- Primerless metal bonding
- Choice of 5, 15, 30 and 60 minute open times
- Non-critical mix ratio
- Combination of rigidity and toughness
- Non-sag handling characteristics
- Excellent environmental resistance

BENEFITS

- No surface treatment or priming required for most metals
- Selection to fit application and process requirements
- Excellent performance with manual or metered mixing
- High strength bonds that resist shear, peeling and impact forces
- Facilitates application on non-level surfaces
- Permanent bonds in harsh operating environments

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

	<u>Part A Adhesive</u>	<u>Part B Activator</u>	<u>Mixed A+B</u>
Color:	Off White	Amber	Amber
Mix ratio by volume:	1	1	
Mix ratio by weight:	1.08	1	
Viscosity, cps:	80,000 - 120,000	100,000 - 140,000	
Density, grams/ml:	1.02	0.94	0.98
Unit weight, lb/gallon:	8.49	7.83	8.17

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

Tensile Strength psi (mpa)	2,500 - 3,100 (17 - 21)
Maximum Tensile Elongation (%)	>80
Modulus psi ³ (mpa)	69,000 - 89,000 (475 - 613)
Lap Shear Strength ⁴ psi (mpa)	2,700 - 3,200 (19 - 22)
Service Temperature, °F (°C)	-40 to 180 (-40 to 82)

RECOMMENDED SUBSTRATES

Acrylics	FRP
PVC, ABS	Vinylester
Coated Metals	Polyester Gelcoat
Aluminum ²	Other Thermoplastics
Steel ²	

Bonds are generally resistant to the effects of heat, water and moisture, aqueous chemicals and most petroleum hydrocarbons, including gasoline, motor oil and diesel fuel. Not recommended for immersion or long-term exposure to concentrated acids or bases, or aggressive organic solvents such as toluene, ketones, and esters. User must determine the suitability of each adhesive for its intended use and application.

1. Most thermoplastics can be bonded with no surface preparation other than a dry wipe or air blow-off. If contamination is visible or suspected, wipe with alcohol prior to bonding. Polyolefins, thermoplastic polyesters, fluorocarbon plastics and other low surface energy plastics are generally not bondable. Testing is required on thermoset plastics because of the variations in compositions and bondability. See important notes a, b and c on reverse side.
2. Prepare metal for bonding by removing all 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. Modulus as measured in the linear portion of the stress strain curve.
4. Lap shear strength of unprimed aluminum to aluminum bond based on ASTM D 1002 method.

SS1500 PRODUCT PROPERTIES @ 75°F (24°C)

Adhesive / Activator	Working Time Minutes	Fixture Time Minutes
SS1505 (SS1500A / SS1505B)	4 - 6	>15
SS1515 (SS1500A / SS1515B)	12 - 16	>30
SS1530 (SS1500A / SS1530B)	25 - 35	>60
SS1560 (SS1560A / SS1515B)	50 - 70	>140

SAFETY AND HANDLING

Read Material Safety Data Sheet before handling or using this product. Adhesive components A and B contain methyl methacrylate monomer and both 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 controlled by the mass and thickness of the mixed product. Large masses over 1/2 inch thick can develop heat in excess of 250°F/121 °C and can generate harmful, flammable vapors. Large curing masses should be carefully moved to a well-ventilated area where the chance of personal contact is minimized.

CURING: Open time is the approximate time after mixing components A and B that the adhesive remains fluid and bondable. Fixture time is the approximate time after mixing components A and B required for the adhesive to develop sufficient strength 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 75°F/24°C. Higher temperatures speed the curing reaction, which reduces open working time and speeds the development of strength. The reverse is true for lower temperatures. If significant variation in temperatures or application at very high or low temperatures is anticipated, contact your IPS representative for technical assistance.

DISPENSING EQUIPMENT: Dispensing directly from disposable cartridges or meter-mix-dispensing equipment is strongly recommended. Both methods employ convenient static motionless mixer technology. Product supplied in pre-measured cartridges is dispensed from approved manual or pneumatic powered guns. Contact your IPS 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 or aluminum or have a sufficient thickness of chemically resistant material that prevents contact between the adhesive components and the base metal. Contact with copper, zinc, brass or other alloys containing these materials must be strictly prevented. All non-metallic seals and gaskets should be fabricated from Teflon® or UHMW polyethylene based materials. Natural rubber, nitrile rubber (BUNA), neoprene and Viton® are not acceptable. Ethylene -propylene rubbers, such as Nordel® may be used for ram follower plate o-rings, but a polyethylene sheet must be used to prevent direct contact with the adhesive.

APPLICATION: Follow instructions provided or contact your IPS 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 color and is uniform, without streaks. If previously opened or 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 will be 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. If in doubt, use shims or spacers to set the gap. A minimum gap of 20 mils (0.020 inch) is recommended. Test the curing adhesive at the edges for fingernail hardness before removing clamps or fixtures. If clean up of the adhesive from the bonded area is required, carefully wipe with alcohol or other preferred industrial solvent while the adhesive is still wet or soft, taking care not to disturb or move the mated parts. Partially cured adhesive can be carefully removed with a sharp knife. Cured adhesive must be sanded or scraped, using a suitable solvent to remove remaining traces.

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 IPS 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 IPS facilities. Shelf life is based on steady state storage between 55°F and 80°F (13°C and 27°C). Exposure, intermittent or prolonged, above 80°F (27°C) will result in a reduction of the stated shelf life. Exposures above 100°F (38°C) 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 50°F and 65°F (10°C and 18°C). KEEP FROM FREEZING.

IMPORTANT NOTES

- SUBSTRATE AND APPLICATION COMPATIBILITY.** The user must determine the suitability of a selected adhesive for a given substrate and application. IPS strongly recommends laboratory, shop and end-use testing that simulates the actual manufacturing and end-use environment.
- 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.
- TECHNICAL ASSISTANCE.** Contact your IPS representative for questions or assistance with the selection of adhesives and methods for evaluating adhesives for your intended application.

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 IPS 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 IPS, our warranty is limited to the replacement of defective IPS products.