

SS300 Series METHACRYLATE ADHESIVES

Technical Data Sheet
SS305, SS315, SS316, SS340



DESCRIPTION

IPS WELD-ON® SS300 Series methacrylate adhesives are two-component, 10:1 mix ratio products for bonding metals, composites and other plastic parts¹. Most metals can be bonded without priming². These advanced products are designed to meet specific requirements of the transportation industry, including reduced read through on show surfaces. The combination of minimum surface preparation^{1, 2}, primerless metal bonding and low read through makes the SS300 series products ideal for a variety of assembly operations. Packaging options include 490 ml cartridges and 5 and 50-gallon containers for use with meter-mix dispensing equipment. A higher viscosity product, SS316, is available and recommended for most bulk meter-mix applications.

PERFORMANCE HIGHLIGHTS

- Primerless metal bonding
- Reduced bond line read through
- Choice of 5, 15 and 40 minute open times
- Non-sag application characteristics
- Excellent environmental resistance
- Permanent toughness

BENEFITS

- No surface treatment or primers required for most metals²
- Reduced post finishing requirements
- Selection to fit application and process requirements
- Facilitates application on non-level surfaces
- Permanent bonds in harsh operating environments
- Excellent fatigue, impact and shock load resistance

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

	Part A Adhesive	Part B (SS605B) Activator	Mixed A+B
Color:	Off White	Black	Black ⁵
Mix ratio by volume:	10	1	
Mix ratio by weight:	8.75	1	
Viscosity cps (SS305, SS315, SS340)	180,000 - 250,000	80,000 - 120,000	
Viscosity cps (SS316)	300,000 - 350,000		
Density, grams/ml	1.01	1.15	1.02
Unit weight, lb/gallon	8.40	9.60	8.51

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

Tensile Strength psi (mpa)	2,000 - 2,200 (14 - 15)
Maximum Tensile Elongation (%)	100 - 125
Modulus psi ³ (mpa)	30,000 - 40,000 (207 - 276)
Lap Shear Strength ⁴ psi (mpa)	2,500 - 2,800 (17 - 19)
Service Temperature °F (°C)	-40 to 180 (-40 to 82)

RECOMMENDED SUBSTRATES

Acrylics	Polyester & Vinyl Esters
PVC, ABS	Polyester Gelcoats
Coated Metals	Epoxy
Metals	SMC

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. It is the user's responsibility to 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 wide variations in compositions. Look at important notes a, b & c on reverse side.
2. Prepare metals for bonding 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. Modulus as measured in the linear portion of the stress/strain curve.
4. Lap shear strength for unprimed aluminum to aluminum bond based on ASTM D 1002.
5. Primary cured adhesive color of products offered in cartridges. Other colors are possible with products sold in bulk. Physical properties may vary slightly.

SS300 PRODUCT PROPERTIES @ 75°F (24°C)

Adhesive / Activator	Working Time Minutes	Fixture Time Minutes
SS305 (SS305A / SS605B)	4 - 6	>15
SS315 (SS315A / SS605B)	13 - 17	>30
SS316 (SS316A / SS605B)	14 - 18	>25
SS340 (SS340A / SS605B)	35 - 45	>80

SAFETY AND HANDLING

Read Material Safety Data Sheet before handling or using this product. Adhesive components 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 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 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 75°F/24°C. 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 IPS representative for technical assistance.

DISPENSING EQUIPMENT: Dispensing from disposable cartridges or meter-mix-dispensing 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. 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 stainless steel, aluminum 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 non-metallic seals and gaskets should be fabricated from Teflon[®], or polyethylene based materials. Natural rubber, nitrile rubber (BUNA), neoprene and Viton[®] are not acceptable.

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 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 (0.02 inch) is recommended for all other adhesives. 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, we recommend that it is carefully performed using alcohol or other preferred industrial solvent while the adhesive is still wet or soft. 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.