

DESCRIPTION

WELD-ON® SS230 HV (High Viscosity) methacrylate adhesive, is a two-component, 10:1 mix ratio product for bonding composite and other plastic parts with little to no surface preparation^{1,2}. The adhesive is designed to work with a selection of activators to provide a wide range of working times from 30 to 120 minutes. SS230 HV is mostly used in marine, transportation and construction applications. It is especially suited for bonding large structural parts requiring long working times and for filling deep irregular gaps up to 1.5 inches (39 mm). SS230 HV is available in 5 and 50-gallon (19 and 189 liters) bulk containers for application with meter-mix dispense equipment. The combination of SS230 HV A with SS220 B activator is recommended only for use above 85°F (29°C) ambient temperature.

PERFORMANCE BENEFITS

- Unique high viscosity formulations → *Reduced slide or sagging even on inverted surfaces*
- Reduced emissions → *Less offensive odor, cleaner air in work place*
- Choice of 30, 40, 60, 80 and 120 minute working times → *Single adhesive, choice of activators, reduced inventory*
- Improved tack free cure, thin film cure → *Little to no residual odor after cure*
- Minimal surface preparation^{1,2} → *Reduced cost, faster cycle time & cleaner work place*
- Excellent environmental resistance → *Permanent bonds in harsh operating environments*
- Permanent toughness and elasticity → *Excellent fatigue, impact and shock load resistance*

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

	Part A Adhesive	Part B (SS216 HV B) Activator	Mixed A+B
Color	Off White	Gray ⁵	Gray
Mix ratio by volume	10	1	
Mix ratio by weight	8.4	1	
Viscosity, cps	900,000 - 1,400,000	120,000 - 180,000	
Density, g/cc	0.97	1.15	0.99
Unit weight, lb/gallon	8.09	9.60	8.25

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

Tensile Strength psi (MPa)	3,000 - 4,000 (20 - 28)	Lap Shear Strength (FRP) psi (MPa)	1,850 - 2,200 (12.8 - 15.2)
Maximum Tensile Elongation (%)	150 - 230	Lap Shear Strength ⁴ psi (MPa)	1,700 - 2,100 (11.8 - 14.6)
Tensile Modulus ³ psi (MPa)	80,000 - 103,000 (550 - 710)	Service Temperature °F (°C)	-40 to 180 (-40 to 82)

RECOMMENDED SUBSTRATES

- **COMPOSITES**
 - Epoxy
 - Polyester & DCPD Modified
 - Vinyl Ester
- **GEL COATS**
- **METALS²**
 - Aluminum
 - Carbon Steel
 - Stainless Steel
- **COATED METALS**
- **THERMOPLASTICS¹**
 - ABS
 - Acrylic
 - PVC/CPVC
 - Styrenics
 - Other Thermoplastics

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

Adhesive / Activator	Working Time Minutes	Fixture Time Minutes
SS230 HV A / SS605 B	25 - 35	>45
SS230 HV A / SS214 B	35 - 45	>60
SS230 HV A / SS216 B	50 - 70	>140
SS230 HV A / SS218 B	70 - 90	>180
SS230 HV A / SS220 B	100 - 130	>260

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.

NOTES:

- 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 due to variations in bondability. See important notes a, b, and c on reverse side.
- Prepare metal for bonding by removing all dust, loose scale, rust, and other surface residue including oil and grease. Use of MP100 Metal Primer is a necessity and strongly recommended for stainless steel and aluminum bonding. Heavy grinding or sanding may interfere with the chemical action of MP100 and is not recommended, especially with aluminum and stainless steel. For maximum bond strength on steel, abrade the mating surfaces prior to bonding. See notes a, b and c on reverse side. Value will depend on strength and stiffness of substrate.
- Tensile modulus as measured in the linear portion of the stress/strain curve.
- Lap shear strength for primed aluminum to aluminum bond based on ASTM D 1002.
- Gray is the primary activator choice for SS230 HV. Other colors are also available; contact your representative for more information.

Technical Data Sheet

SS230 HV

METHACRYLATE ADHESIVE

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 1.5 inch (39 mm) thick can develop heat in excess of 250°F (121°C) and can generate vapors 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 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 dispense equipment is highly recommended. Both methods employ convenient static motionless mixer technology. Product 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 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 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, 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. SS230 HV adhesive and SS218 B and SS220 B activators should not be applied in gaps of less than 1/8 (0.125) inch. A minimum gap of 20 mils (0.02 inch) is suitable for all the other activator combinations. Use a soft faring tool to remove excess adhesive from the bonded assembly. The use of a masking tape or other protective barriers should be used to prevent contamination on any cosmetically sensitive areas. Test the curing adhesive at the edges for fingernail hardness before removing clamps or fixtures. Partially cured adhesive can be removed with a sharp knife and any remaining cured adhesive 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 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 for your use.

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 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.