

PLEXUS MA515

Description Plexus® MA515 is a two-part methacrylate adhesive designed for structural bonding of thermoplastic, metal, and composite assemblies¹. Combined at a 1:1 ratio, MA515 has a working time of 10 to 15 minutes at 74 F (23 C). MA515 achieves lap shear values of 5MPa and 10 MPa within 30 and 60 minutes respectively. This product has been designed for use on large structures where a moderate open time product is needed. Plexus MA515 may be used for composite and metal bonding for small to large structures. In addition, this product provides a unique combination of excellent fatigue endurance, outstanding impact resistance, and superior toughness. Plexus MA515 is gray when mixed and is available in ready-to-use 400 ml cartridges, 5 gallon (20 litre) pails and 50 gallon (200 litre) drums to be dispensed as a non-sagging gel.

Characteristics	Room Temperature Cure	
	▪ Working Time ²	10 – 15 minutes
	▪ Fixture Time ³	30 – 35 minutes
	▪ Operating Temperature ⁶	-40°F – 250°F (-40°C – 120°C)
	▪ Gap Filling	0.03 in. to 0.70 in. (0.75mm to 18mm)
	▪ Mixed Density	7.95 lbs/gal (0.95 g/cc)
	▪ Flash Point	51°F (11°C)

Chemical Resistance⁴	Excellent resistance to:	Susceptible to:
	▪ Acids and Bases (3-10 pH) ▪ Salt Solutions	▪ Polar Solvents ▪ Strong Acids and Bases

Physical Properties (uncured) – Room Temperature	Adhesive	Activator	
	Viscosity, cp	140,000 - 200,000	140,000 - 200,000
	Color	White	Black
	Density, lbs/gal (g/cc)	7.75 (0.95)	7.95 (0.95)
	Mix Ratio by Volume	1.0	1.0
	Mix Ratio by Weight	1.0	1.0

Mechanical Properties (Cured) Room Temperature	Tensile (ASTM D638)	
	▪ Strength, psi (MPa)	2,500 – 3,500 (17.2 – 24.1)
	▪ Modulus, psi (MPa)	50,000 – 70,000 (344 – 483)
	▪ Strain to Failure (%)	TBC

Recommended for:	▪ ABS	▪ PVC	▪ Styrenics
	▪ Acrylics	▪ Polyesters	▪ Vinyl Esters
	▪ FRP	(including DCPD modified)	
	▪ Gelcoats ⁵	▪ Stainless Steel*	
			* Plexus Primer Suggested ⁷

Lap Shear (ASTM D1002)	Cohesive Strength psi (MPa)	2,000 – 2,500 (13.8 – 17.2)
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HANDLING AND APPLICATION

Plexus® MA515 adhesive (Part A) and activator (Part B) are flammable. Contents include Methacrylate Ester. Keep containers closed after use. Wear gloves and safety glasses to avoid skin and eye contact. Wash with soap and water after skin contact. In case of eye contact, flush with water for 15 minutes and get medical attention. Harmful if swallowed. Keep out of reach of children. Keep away from heat, sparks, and open flames. Reference the Material Safety Data Sheet for more complete safety information.

Note: Because of the rapid curing features of this product, large amounts of heat are generated when large masses of material are mixed at one time. The heat generated by the exotherm resulting from the mixing of large masses of adhesive can result in the release of entrapped air, steam, and volatile gases. To prevent this, use only enough material as needed for use within the working time for the product and confine gap thickness to no more than 0.70 in. (18mm). Questions relative to handling and applications should be directed to ITW Polymers at +353 61 471 299.

DISPENSING ADHESIVE

MA515 may be applied manually or with all stainless steel bulk dispensing equipment⁸. Static mixer selection is critical to the proper mixing and performance of Plexus adhesives. All machines dispensing Plexus should have shrouds where applicable. For additional information concerning meter-mix equipment, contact ITW Polymers Sales Representatives. Pre-measured cartridges are also available, as well as the hand-held guns with which to dispense the adhesive. To assure maximum bond strength, surfaces must be mated within the specified working time. Use sufficient material to ensure the joint is completely filled when parts are mated and clamped. All adhesive application, part positioning, and fixturing should occur *before* the working time of the mix has expired. After indicated working time, parts must remain undisturbed until the fixture time is reached. Automated equipment should be constructed of stainless steel or aluminum. Avoid contact with copper or copper containing alloys in all fittings, pumps, etc. Seals and gaskets should be made of Teflon, Teflon-coated PVC foam, ethylene/propylene or polyethylene. Avoid the use of Viton, BUNA-N, Neoprene or other elastomers for seals and gaskets. Clean up is easiest *before* the adhesive has cured. Citrus terpene or N-methyl pyrrolidone (NMP) containing cleaners and degreasers can be used for best results. If the adhesive is already cured, careful scraping, followed by a solvent wipe may be the most effective method of clean up.

EFFECT OF TEMPERATURE

Application of adhesive at temperatures between 65°F (18°C) and 80°F (26°C) will ensure proper cure. Temperatures below 65°F (18°C) will slow cure speed; above 80°F (26°C) will increase cure speed. The viscosities of Parts A and B of this adhesive are affected by temperature. To ensure consistent dispensing in meter-mix equipment, adhesive and activator temperatures should be held reasonably constant throughout the year. Do not ship below 32°F (0°C). If this occurs, one can expect the material to recover in a reasonable time, depending on ambient temperature and mass.

STORAGE AND SHELF LIFE

Shelf life of MA515 adhesive and activator is 6 months from day of shipment from ITW Plexus. Shelf life is based on continuous storage between 54°F (12°C) and 74°F (23°C). Shelf life is based on continuous storage between 54°F (12°C) and 74°F (23°C). Long term exposure above 74°F (23°C) will reduce the shelf life of these materials. Prolonged exposure of activators, including cartridges that contain activators, above 98°F (37°C) quickly diminishes the reactivity of the product and should be avoided. Shelf life can be extended by refrigeration 60°F - 65°F (15°C - 18°C). These products should never be frozen.

Notes

1. ITW Polymers strongly recommends that all substrates be tested with the selected adhesive in the anticipated service conditions to determine suitability.
2. Working Time: The time elapsed between the moment Parts A and B of the adhesive system are combined and thoroughly mixed and the time when the adhesive is no longer useable. Times presented were tested at 74°F (23°C).
3. Fixture Time: The interval of time after which surface being joined will support a 1kg dead weight on a 12.1 mm overlap joint 25.4 mm wide without movement. Times presented were tested at 23°C
4. Resistance to chemical exposure varies greatly based on several parameters including; temperature, concentration, bondline thickness, and duration of exposure. The chemical resistance guidelines listed assume long term exposures at ambient conditions.
5. Urethane-modified super-weathering gelcoats may require an alternate adhesive. As with all substrates, these gelcoats should be tested with the selected adhesive to determine suitability.
6. All adhesives soften with temperature and should be evaluated at expected conditions. Consult with Plexus for values at a specific temperature
7. Exterior applications require the use of coatings or primers that inhibit oxidation of the metals.
8. All machines dispensing Plexus should be stainless steel and have shrouds where applicable.

NOTE: All information on this data sheet is based on laboratory testing and is not intended for design purposes. ITW Polymers makes no representations or warranties of any kind concerning this data. Due to variance of storage, handling and application of these materials, ITW Polymers cannot accept liability for results obtained.