



PLEXUS MA420FS

Description Plexus™ MA420FS is a two-part methacrylate adhesive designed for structural bonding of thermoplastic, metal, and composite assemblies¹. Combined at a 10:1 ratio, MA420FS has a working time of 1 to 2 minutes and achieves approximately 75% of ultimate strength in 5 to 6 minutes at 74°F (23°C). Plexus MA420FS is a standard choice for composites automated bonding applications in the transportation industry, because it requires virtually no surface preparation and its rapid fixture time. In addition, this product provides a unique combination of excellent fatigue endurance, outstanding impact resistance, and superior toughness. Plexus MA420FS is blue when mixed and is supplied in ready-to-use 380 ml cartridges, 5 gallon (20 liter) pails or 50 gallon (200 liter) drums to be dispensed as a non-sagging gel.

Characteristics	Room Temperature Cure	
	<ul style="list-style-type: none"> ▪ Working Time² 1 – 2 minutes ▪ Fixture Time³ 3 – 4 minutes ▪ Operating Temperature -40 F – 180 F (-40°C – 82°C) ▪ Gap Filling⁷ 0.03 in. to 0.125 in. (0.75mm to 4mm) ▪ Mixed Density 8.15 lbs/gal (0.98 g/cc) ▪ Flash Point 51°F (11°C) 	

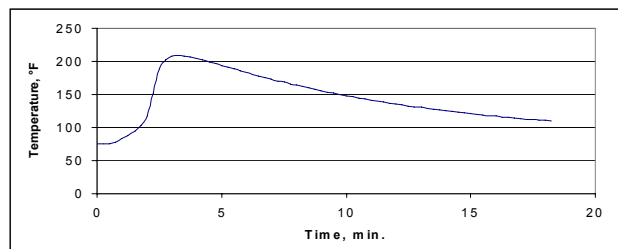
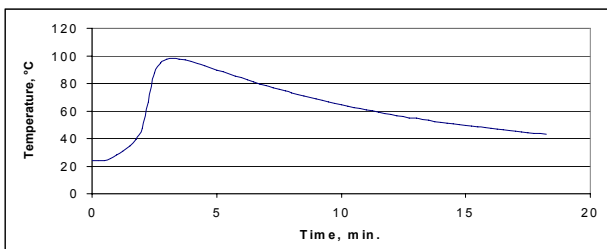
Chemical Resistance⁴	Excellent resistance to:	Susceptible to:
	<ul style="list-style-type: none"> ▪ Hydrocarbons ▪ Acids and Bases (3-10 pH) ▪ Salt Solutions 	<ul style="list-style-type: none"> ▪ Polar Solvents ▪ Strong Acids and Bases

Physical Properties (uncured) – Room Temperature	Viscosity, cp (x's 1000)	Adhesive 80 – 100	Activator 50 – 80
	Color	Off-White	Blue
	Density, lb/gal (g/cc)	7.85 (0.94)	10.40 (1.25)
	Mix Ratio by Volume	10.0	1.0
	Mix Ratio by Weight	7.5	1.0
	Mixer Recommendation	Cartridge (380ml)	MC10:24
		Bulk:	See back & refer to ITW Plexus

Mechanical Properties (Cured) Room Temperature	Tensile (ASTM D638)	
	<ul style="list-style-type: none"> ▪ Strength, psi (Mpa) 1,250 – 1,500 (8.6 – 10.3) ▪ Modulus, psi (Mpa) 35,000 – 50,000 (241 – 345) ▪ Strain to Failure (%) 5 – 15 	

Recommended for:	<ul style="list-style-type: none"> ▪ ABS ▪ Acrylics ▪ FRP ▪ Gelcoats⁶ ▪ Steel, Carbon* 	<ul style="list-style-type: none"> ▪ PVC ▪ Polyesters (including DCPD modified) ▪ Aluminum* ▪ Steel*, Stainless* 	<ul style="list-style-type: none"> ▪ Styrenics ▪ Urethanes (general) ▪ Vinyl Esters

Lap Shear (ASTM D1002)	Cohesive Strength psi (Mpa)	1,300 – 1,600 (8.9 – 11.1) at 0.03 in. gap (0.75 mm)
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Typical Exotherm Curve for MA420FS in a 10 gm Mass at 74°F (23°C)⁵



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HANDLING AND APPLICATION

Plexus[®] MA420FS adhesive (Part A) is 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 0.125in (4mm). Questions relative to handling and applications should be directed to ITW Plexus at 800-851-6692.

DISPENSING ADHESIVE

MA420FS may be applied manually or with all stainless steel bulk dispensing equipment. Static mixer selection is critical to the proper mixing and performance of Plexus adhesives. All machines dispensing Plexus should have shrouds where applicable. Stainless Steel bulk equipment is recommended. For additional information concerning meter-mix equipment, contact ITW Plexus 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.

STORAGE AND SHELF LIFE

Shelf life of MA420FS adhesive (Part A) is 1 year. Shelf life of activator (Part B), including cartridges that contain activators, is 9 months. 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. These products should never be frozen.

ITW PLEXUS, 30 Endicott Street, Danvers, MA 01923 USA

TEL: 800-851-6692

FAX: 978-774-0516

e-mail: info@itwplexus.com

Notes

1. ITW Plexus 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 1 kg dead weight on a 0.50 in. (12mm) overlap joint 1.00 in. (25mm) wide without movement. Times presented were tested at 74°F (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. In a typical bond line, exotherm temperatures will be lower than the temperatures shown.
6. 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.
7. For optimal bond gaps 0.03 in. (0.76 mm) is recommended. Below these values consult with an ITW Plexus representative.
8. Exterior applications require the use of coatings or primers that inhibit oxidation of the steel.

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

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Plexus[®] materials



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