PLEXUS®

A brand of ITW Polymers Adhesives North America

TECHNICAL DATA SHEET

MA310

Children & Schools GREENGUARD® Indoor Air Quality Certified

Description

Plexus ® MA310 is a two-part methacrylate adhesive designed for structural bonding of thermoplastic, metal, and composite assemblies[1]. Combined at a 1:1 ratio, MA310 is a meduium curing adhesive system. MA310 offers a combination of high strength and stiffness as well as the ability to bond a wide range of materials. Plexus MA310 is supplied in ready-to-use 400 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**		
	▪ Working Time[2]	15 – 18 minutes	
	▪ Fixture Time[3]	45-55 minutes	
	▪ Operating Temperature[6]	-67°F – 250°F (-55°C – 121°C)	
	▪ Gap Filling	0.03 in. to 0.125 in. (0.75 mm to 3.2 mm)	
	▪ Mixed Density	8.0 lbs/gal (1.00 g/cc)	
	▪ Flash Point	51°F (11°C)	
Chemical Resistance[4]	**Excellent resistance to:**	**Susceptible to:**	
	▪ Hydrocarbons	▪ Polar Solvents	
	▪ Acids and Bases (pH 3-10)	▪ Strong Acids and Bases	
	▪ Salt Solutions		
Typical Physical Properties (uncured) – Room Temperature		**Adhesive**	**Activator**
	Viscosity, cP	40,000 – 70,000	40,000 – 70,000
	Color	Off-White	Yellow
	Density, lbs/gal (g/cc)	8.3 (1.0)	7.8 (0.94)
	Mix Ratio by Volume	1.0	1.0
	Mix Ratio by Weight	1.0	1.0
	Mixer Recommendation:	Cartridge (50ml):	50ml 1:1 static mixer
		Cartridge (400ml):	30 Element 0.34-in. (8.6-mm) square mixer
		Bulk:	See back & refer to ITW Plexus
Typical Mechanical Properties (Cured) – Room Temperature	**Tensile (ASTM D638)**		
	▪ Strength, psi (MPa)	3,500– 4,500 (24.1 – 31.0)	
	▪ Modulus, psi (MPa)	150,000 – 175,000 (1034 – 1207)	
	▪ Strain to Failure (%)	5 – 15	
	Lap Shear (ASTM D1002)		
	▪ Cohesive Strength, psi (MPa)	3,000 – 3,500 (20.7 – 24.1) at 0.03 in. gap (0.75 mm)	

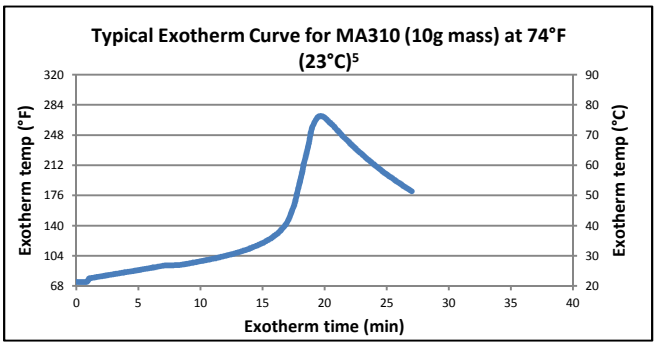
Recommended for:

- ABS
- Acrylics
- FRP
- Gelcoats
- Steel, Carbon*
- PVC
- Polyesters (including DCPD modified)
- Aluminum*
- Steel, Stainless*
- Styrenics
- Urethanes (general)
- Vinyl Esters

* **Plexus Primer** Suggested[7]

VOC's	% (g/L)
During Cure (see back page)	<1 (<10)

Shelf Life	Months
Adhesive (A Side)	7
Activator (B Side)	13
B Side Black	13
Standard Colors in Cartridges	7
Black in Cartridges	7



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SAFETY & HANDLING: ITW Plexus® adhesive (Part A) and activator (Part B) are flammable. Contents include methacrylate esters. 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. For more complete heath and safety information contact ITW Plexus for a Material Safety Data Sheet (MSDS).

NOTE: This material is mass sensitive. A large amount of heat may be generated when large masses of material are mixed at one time. Further, the heat generated by the exotherm resulting from the mixing of large masses of this system can result in the release of entrapped air, steam, and volatile gases. To prevent this, dispense only enough material as needed for the application and for use within the working time of the product and confine gap thickness to no more than its maximum gap fill capability. Questions relative to handling and applications should be directed to ITW Plexus at 800-851-6692.

DISPENSING ADHESIVE AND APPLICATION: ITW Plexus Adhesives may be applied manually or with all stainless steel bulk dispensing equipment. Automated applications may be accomplished with a variety of 1-to-1 meter-mix equipment delivering both components to a static mixer. 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. For more information, contact ITW Plexus. 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. Clean up is easiest *before* the adhesive has cured. Citrus terpene or N-methyl pyrrolidone (NMP) containing cleaners, degreasers, and soap and water can be used for best results. If the adhesive is already cured, careful scraping, followed by a wiping with a cleaning agent, may be the most effective method of clean up.

EFFECT OF TEMPERATURE: Application of adhesive at temperatures between 65°F (18°C) and 85°F (30°C) will ensure proper cure. Temperatures below 65°F (18˚C) or above 85°F (30°C) will slow down or increase cure rate significantly, respectively. Temperature affects viscosities of Parts A and B of this adhesive. To ensure consistent dispensing in meter-mix equipment, adhesive and activator temperatures should be held reasonably constant throughout the year. Adhesive in cured state behaves differently at elevated and low temperatures. See ITW Plexus for specific values.

STORAGE AND SHELF LIFE: 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. Prolonged exposure above 98°F (37°C) quickly diminishes the reactivity of the product. These products should never be frozen.

VOC'S: As calculated according to Appendix A to Subpart PPPP of EPA Part 63, Plastics Part and Coatings MACT. The amount of volatile material released when 10-15g of mixed adhesive is allowed to cure between foil for 24 hours at room temperature followed by 1 hour at 220°F (104°C). See ITW Plexus for specific values.

PRODUCT USE: Many factors beyond ITW PLEXUS® control and uniquely within user's knowledge and control can affect the use and performance of an ITW PLEXUS® product in a particular application. Given the variety of factors that can affect the use and performance of an ITW PLEXUS® product, the end user is solely responsible for evaluating any ITW PLEXUS® product and determining whether it is fit for a particular purpose and suitable for user's design, production and final application.

EXCLUSION OF WARRANTIES: AS TO THE HEREIN DESCRIBED MATERIALS AND TEST RESULTS, THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF ITW PLEXUS® MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SINCE THE USE OF THE HEREIN DESCRIBED INVOLVES MANY VARIABLES IN METHODS OF APPLICATION, DESIGN, HANDLING AND/OR USE, THE USER, IN ACCEPTING AND USING THESE MATERIALS, ASSUMES ALL RESPONSIBILITY FOR THE END RESULT. ITW PLEXUS® SHALL NOT OTHERWISE BE LIABLE FOR LOSS OF DAMAGES, WHETHER DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL, REGARDLESS OF THE LEGAL THEORY ASSERTED, INCLUDING NEGLIGENCE, WARRANTY OR STRICT LIABILITY.

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: Varies with bond gap and ambient temperature. Present values were measured at 74°F (23°C).**
4. **Resistance to chemical exposure varies greatly based on several parameters including temperature, concentration, bond line 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. **All adhesives soften with temperature and should be evaluated at expected conditions. Consult with ITW Plexus for values at a specific temperature.**
7. **Exterior applications require the use of coatings or primers that inhibit oxidation of the metals.**

NOTE: The technical information, recommendations, and other statements contained in this document are based upon tests or experience that ITW PLEXUS® believes are reliable, but the accuracy or completeness of such information is not guaranteed. The information provided is not intended to substitute for the customers own testing.

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