



TECHNICAL DATA SHEET – PLEXUS MA420

Date: 03/2017

PRODUCT DESCRIPTION

Plexus MA420 is a two-part methacrylate adhesive designed for structural bonding of thermoplastic, metal, and composite assemblies¹. Combined at a 10:1 ratio, MA420 is a rapid-curing system. Plexus MA420 is the standard choice for composites bonding applications in the transportation industry, because it requires virtually no surface preparation. In addition, this product provides a unique combination of excellent fatigue endurance, outstanding impact resistance, and superior toughness. Plexus MA420 is available in off-white or blue colours and is supplied in ready to use cartridges, 20 litre pails or 200 litre drums to be dispensed as a non-sagging gel.

CHARACTERISTICS

ROOM TEMPERATURE CURE	
WORKING TIME ²	4 - 6 minutes
FIXTURE TIME ³	18 - 22 minutes
OPERATING TEMPERATURE ⁶	-55°C - 121°C
GAP FILLING ⁷	0.75mm to 9.5mm
MIXED DENSITY	0.98 g/cc
FLASH POINT	11°C

CHEMICAL RESISTANCE⁴

EXCELLENT RESISTANCE TO	SUSCEPTIBLE TO
Hydrocarbons	Polar Solvents
Acids and Bases (3-10 pH)	Strong Acids and Bases
Salt Solutions	

PHYSICAL PROPERTIES (UNCURED) – ROOM TEMPERATURE

	ADHESIVE	ACTIVATOR
VISCOSITY, cP	100,000 - 125,000	35,000 - 80,000
COLOUR	Off-White	Blue*
DENSITY, G/CC	0.97	1.09
MIX RATIO BY VOLUME	10	1
MIX RATIO BY WEIGHT	8.9	1
MIXER RECOMMENDATION	Cartridge (380ml): 180AN-830/ITW Bulk: Refer to Plexus	

* MTO activator colours – Neutral

PLEXUS MA420

MECHANICAL PROPERTIES (CURED) - ROOM TEMPERATURE⁹

	TENSILE (ASTM D638)	
	Strength, MPa	18.6 - 20.7
	Modulus, MPa	517- 689
	Strain to Failure (%)	30 - 50
LAP SHEAR (ASTM D1002)	Cohesive Strength MPa	20.7- 26.2 (GBS A-0.75mm gap)

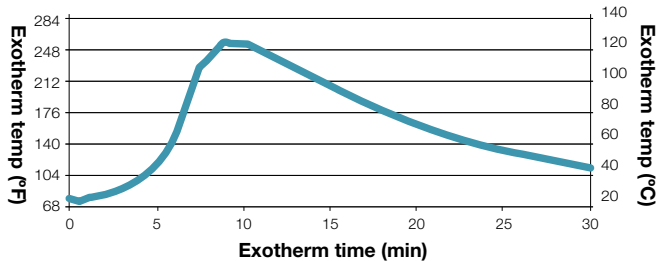
RECOMMENDED FOR:

- ABS
 - Acrylics
 - FRP
 - Gelcoats
 - Steel, Carbon*
 - PVC
 - Polyesters (including DCPD modified)
 - Aluminium*
 - Steel, Stainless*
 - Styrenics
 - Urethanes, Rigid (general)
 - Vinyl Esters
- *Plexus Primer PC 120 Recommended¹⁰

NOTES

1. ITW EP 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 23°C.
3. Fixture Time: Varies with bond gap and ambient temperatures. 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. 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 temperatures. Consult with ITW EP for values at specific temperatures.
7. For bond gaps below the minimum quoted please contact ITW EP.
8. All machines dispensing Plexus should have shrouds where applicable.
9. Attained test values will vary with test method, approach and speed.
10. Exterior applications require the use of coatings or primers that inhibit oxidation of the steel.

Typical Exotherm Curve for MA420 (10g mass) at 74°F (23°C)⁵



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

HANDLING AND APPLICATION

Plexus 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 its maximum gap filling capability. Questions relative to handling and applications should be directed to ITW Engineered Polymers at +353 61 771 500.

DISPENSING ADHESIVE AND APPLICATION

Plexus adhesives may be applied manually or with all stainless steel bulk dispensing equipment. Automated applications may be accomplished with variable ratio equipment capable of 10:1 by volume dispensing. Gear pump machines would be most typically be used to achieve this. 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 Engineered Polymers. 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 and degreasers can be used for best results. If the adhesive is already cured, careful scraping, followed by wiping with a cleaning agent may be the most effective method of clean up.

EFFECT OF TEMPERATURE

Application of adhesive at temperatures between 18°C and 30°C will ensure proper cure. Temperatures below 18°C or above 30°C will slow down or increase cure rate significantly. Temperature affects viscosities of Parts A and B of this adhesive. To ensure consistent dispensing when using automated dispense machine 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 EP for specific values.

STORAGE AND SHELF LIFE

Shelf life of MA420 adhesive (Part A) is 13 months. Shelf life of activator (Part B), including cartridges that contain activators, is 10 months. Shelf life is based on continuous storage between 12°C and 23°C. Long term exposure above 23°C will reduce the shelf life of these materials. Prolonged exposure of activators, including cartridges that contain activators, above 37°C quickly diminishes the reactivity of the product and should be avoided. These products should never be frozen. For **expiry date** see label.