M10 Structural Adhesive

Preliminary TDS Version 21-02

ACRAMAXX ENGINEERED BONDING SOLUTIONS

ADHESIVE DESCRIPTION

ACRAMAXX M10 series structural adhesives are based on methacrylate adhesives and formulated for superior metal bonding performance. The M10 adhesives were developed to withstand post bake oven temperatures up to 380°F (194°C) for up to 30 minutes. The M10 adhesives are available in two working times, M10-6A or M10-18A (Component A). These two adhesive components are formulated to be mixed with a single activator M10-1BNAT (Component B) at a 10:1 mix ratio. These products are designed with fast cure times and high strength to adhere to assemblies of thermoset composites, plastics, and are formulated to be primerless on most metal surfaces. (See all notes on back.) ACRAMAXX adhesives, manufactured by Engineered Bonding Solutions, LLC., are packaged in 50mL and 490mL dual cartridges, as well as 5- and 50-gallon containers for application with meter-mix dispensing equipment.

KEY FEATURES

- Easy 10:1 mix ratio
- Excellent retention of strength 380°F oven bake
- Up to 3,500 psi lap shear strength
- True primerless adhesion on AL, CRS, SS
- Good chemical resistance and sealant properties
- Excellent fatigue characteristics and shock load resistance
- Stable formulations with 6-month shelf-life
- Glass Bead (GB) activator available (M10-1B NAT GB)

SUBSTRATES THAT CAN BE BONDED

Polyesters, vinyl esters, SMC, epoxies, acrylics, PVC/FPVC/CPVC, polycarbonate, ABS, styrenics, stainless steel, carbon steel, aluminum, coated metals, galvanized metals, and many other composites, thermoplastics, and metals.

CHEMICAL RESISTANCE

Cured adhesive is generally resistant to intermittent exposures of salt solutions, hydrocarbons, and acids and bases with a pH range from 3 to 10. See more important notes on chemical resistance on back page.

NOT RECOMMENDED FOR BONDING

Polyolefins: TPO's, polyacetals, and PTFE

TEMPERATURE EXPOSURE

Temperature range for this product is from -40 to 180 °F (-40 to 82 °C) with intermittent exposure between -67 to 250°F (-55 to 121 °C).

Property	Comp A	Comp B
Color	CREAM	NAT
Viscosity (cP)	300K-500K	80K-120K
Mix ratio weight	8.6	1
Mix ratio volume	10 part	1 part
Density g/cc	1.018	1.189
WPG lb/gal	8.485	9.91
GB WPG lb/gal	-	TBD

CURED PHYSICAL PROPERTIES	Typical Values psi (MPa)
Tensile strength	2,200 (15)
Modulus kpsi	100-110 (758)
Elongation (max. %):	10-20
AL 6061	3,000-3,500 (24.1)
AL 6061, Bake 30min @380°F	3,000-3,500 (24.1)
SS 304	3,000-3,500 (24.1)
CRS	3,000-3,500 (24.1)
CRS, Bake 30min@380°F	3,000-3,500 (24.1)
Galvanneal, Bake 30min@380°F	3100-3600 (24.8

All lap shear bonds ASTM D1002 using M10-6NAT and were bonded as received with no preparation or just dry wiping except CRS (light sand). Cure cycle 24hr @ RT followed by 1hr post-cure @ 179.6°F. Additional post bake oven exposure as indicated above prior to testing. Typical failure mode: mixed cohesive or thin film cohesive.

Galvannealed Metals vary by vendor and process, all galvanized bonding applications should be tested prior to bonding by the end user to determine suitability.

10:1 MIX RATIO CARTRIDGE PRODUCTS		
CARTRIDGE→	M10-6NAT	M10-18NAT
Activator → Comp B	M10-1BNAT	M10-1BNAT
Adhesive → Comp A	M10-6A	M10-18A
Typical Working Time	6	18
Typical Fixture Time	10-14	30-40

SEE IMPORTANT INFORMATION AND NOTES ON PAGE 2

IMPORTANT INFORMATION

ACRAMAXX is a trade name of Engineered Bonding Solutions, LLC (hereinafter referred to as "EBS"). All ACRAMAXX 10:1 adhesive (Component A) are flammable, and corresponding activators (Component B) are classed as a non-hazardous. Using proper PPE (Personal Protective Equipment) is strongly recommended. Wear gloves and safety glasses to avoid skin and eye contact. Harmful if swallowed. Please always refer to both TDS and SDS before using any ACRALOCK adhesive product. Questions relative to handling and applications should be directed to 1-855-411-GLUE or email us at info@acralock.com

Adhesives are supplied in dual-component cartridges, 5-gallon pails, and 50-gallon drums to facilitate mixing through approved stainless steel meter mix dispensing equipment. Always use a static mixer with sufficient elements to ensure a homogeneous mix. We do not recommend mixing by hand. Please contact your EBS representative for questions about dispensing equipment manufacturers and approved seal and gasket materials. Automated equipment should be constructed of stainless steel. An exothermic chemical reaction occurs when components A and B are mixed and will generate heat. The amount of heat generated is relative to amount of mass of mixed product, and also the working time of the Components A and B are more relative to reactivity of product. Generally, faster curing products applied in larger beads or mixed product left in large quantities can cause rapid boiling of monomers under excessive heat of reaction. These vapors are flammable and harmful if inhaled. Cutting and scraping is advised. Avoid sanding and grinding as this can produce noxious smoke that could contain harmful constituents. In this case, consider a forced air breathing apparatus (PPE). After proper mixing of components, the VOC content of cured product will be less than 20 g/L (0.17 lbs/gal).

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. The working time is the approximate time that the adhesive remains fluid and will still wet the surface of the adherend after mixing component A (adhesive) and component B (activator). The fixture time is the approximate time after mixing that the bonded assembly can be unclamped or moved. However, both working time and fixture time will increase or decrease depending on ambient temperatures and thickness of application. Thin applications in colder conditions can substantially increase fixture time. The reported data presented in the TDS are based on tests conducted under laboratory conditions of 75°F/24°C. For applications in hot or cold ambient conditions, please consult your EBS representative. Clean-up is easiest before the adhesive has cured with citrus terpene, N-methylpyrolidone (NMP), polar solvents, or ketones. To avoid contaminating wet adhesive cosmetic surfaces with these cleaners, use masking tape, and remove after applying while adhesive is wet. If the adhesive has already cured, the most effective method of clean-up may be carefully removing by scraping with a sharp tool followed by a solvent wipe.

IMPORTANT NOTES:

Surface Preparation: The need for surface preparation must be determined by the user based on comparative testing of unprepared and prepared substrates to determine if strengths are adequate for application. Clean adhesive surface failure is not desired for long-term durable performance. In all cases, initial shear strength tests must be followed up with simulated or actual durability tests to ensure 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.

Most thermoplastics listed above 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. Low surface energy plastics like polyolefins, thermoplastic polyesters, and fluorocarbon plastics are generally not bondable.

Metals: Acramaxx M10 adhesives were primarily developed to bond aluminum, stainless, and cold-rolled steel with little to no preparation based on "as received" condition. If oxidation and/or surface contamination is present, then you should clean and sand to remove before bonding. Some galvanized metals can be bonded, however the Acramaxx M1 series is suggested for all galvanized metals. We recommend environmental testing to determine the performance for your intended application and use.

Thermoset composites are generally bonded without preparation; however, mold releases and process can produce varied bonding performance, thus testing should be performed.

Elevated temperature cohesive strength at 180°F retains a minimum of 500 psi as measured on aluminum. Bonds can be exposed to intermittent temperatures up to 250°F, provided at the higher temperature range bonding assembly is in a fixture and not under shear load. User must determine suitability for all applications and operating conditions. Specific oven bake exposures were tested on unprepared aluminum coupons for 30 minutes at 384°F and 400°F providing higher shear strength results after heat exposure.

Chemical Resistance: EBS strongly recommends laboratory and end-use testing representative of the environmental conditions and how the bonded assembly will be used. Bonds are generally resistant to the effects of heat, water and moisture, aqueous chemicals, and some intermittent exposure of gasoline, motor oil, and diesel fuel. Not recommended for immersion or long-term exposure to all hydrocarbons, concentrated acids or bases, or aggressive organic solvents, such as toluene, ketones, and esters.

The shelf life of Components A and B in unopened containers is approximately six months from the date the product is manufactured at EBS 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. Shelf-life of both components can be extended by air-conditioned or refrigerated storage between 55°F and 65°F (13°C and 18°C).