MA205HV Technical Data Sheet

PRELIMINARY

PLEXUS® Structural Adhesives

Benefits

Fast cure at room temp.
Self-priming to metals [1]
High toughness
High strength
Little to no surface preparation

Typical Characteristics

Working Time [2]:
Approximately 3-5 minutes

Handling Strength (50 psi) [3]:
Approx. 8 min. on polycarbonate

Operating Temperature:
-40°F to 180°F (-40°C to 82°C)

Gap Fill: up to 0.25 in (6.4 mm)

Mixed Density:
8.10 lbs./gal (0.97 g/cc)

Chemical Resistance

Excellent resistance to
- Hydrocarbons
- Acids and Bases (3-10 pH)
- Salt Solutions

Susceptible to
- Polar Solvents
- Strong Acids and Bases

Recommended for:

Metals [4]: Aluminum, Magnesium, Stainless, CRS
Most Engineered Plastics: ABS, Polycarbonate, PVC, Acrylics
FRP: VE, Polyesters (including DCPD modified), Epoxies

Plexus® MA205HV is an advanced non conductive two-part methacrylate adhesive designed for the structural bonding of various electronic assemblies. In addition, MA205HV does a superb job of bonding of metals without primers, and engineered thermoplastics and composite assemblies with little to no surface preparation. Combined at a 10:1 ratio by volume, MA205HV has a working time of approximately 3-5 minutes and achieves a handling strength of 50 psi in approximately 8 minutes on polycarbonate.[3] This product provides a unique combination of high strength, excellent fatigue endurance, outstanding impact resistance, and superior toughness.

NOTE: ALL DATA PRESENTED ARE PRLIMINARY AND SUBJECT TO CHANGE.

Physical Properties (Uncured) –Room Temperature

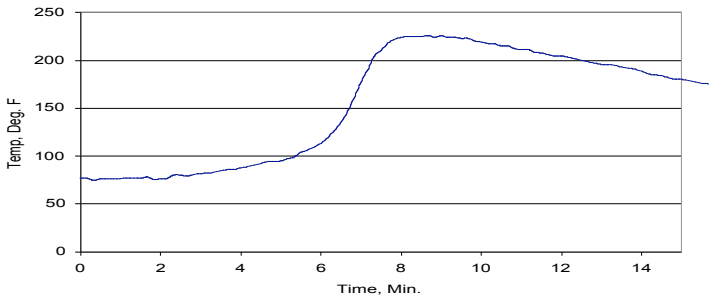
	Adhesive	Activator
Viscosity, cps	100,000 – 130,000	20,000 – 50,000
Color	off-white	Blue
Density, lbs./gal (g/cc)	8.00 (0.96)	8.90 (1.07)
Mix Ratio by Volume	10.0	1.0
Mix Ratio by Weight	9.0	1.0

Adhesion Performance [5a]

Lap Shear Strength, 73° F (23° C)
880 psi (6.1 MPa), on ABS [b] (SF)
1,500 psi (10.3 MPa), on Polycarbonate [c] (SF, CF)
2,500 psi (17.1 MPa), on Aluminum 6061 [d] (CF)

Lap Shear Strength 180° F (82° C)
1,000 psi (6.8 MPa), on Aluminum 6061 [d] (CF)

T-Peel Strength, 73° F (23° C)
42 lbf/inch, on Aluminum 6061 [e] (CF)



Typical Exotherm Curve for MA205HV at 75°F (10 grams) at 10:1 mix ratio by volume[6]

HANDLING AND APPLICATION:

Plexus® MA205HV adhesive (Part A) is flammable and contains 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 nature of this product, excessive heat is generated when large masses of material are mixed at one time. The excessive heat generated by the exotherm can result in the release of entrapped air, steam, and volatile gases. To prevent this, use only enough material as needed for the application within the working time for the product and confine gap thickness of 0.012 inches to no more than 0.25 inch. For gap thicknesses outside this range, consult with an ITW Plexus representative. Questions relative to handling and applications should be directed to ITW Plexus at 800-851-6692.

DISPENSING ADHESIVE:

MA205HV may be applied manually or with ***stainless steel*** bulk dispensing equipment. Static mixer selection is critical to the proper mixing and performance of Plexus adhesives. ITW Plexus recommends a 10-24 static mixer for MA205HV for optimal mixing from standardized cartridges. For additional information concerning meter-mix equipment, contact ITW Plexus Sales Representatives. 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 expires. After indicated working time, parts must remain undisturbed until the fixture time is reached. Clean up is easiest *before* the adhesive cures. Citrus terpene or N-methyl pyrolidone (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. **NOTE:** 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.

EFFECT OF TEMPERATURE:

Application of adhesive at temperatures between 70°F and 80°F will ensure the most consistent cure. Ambient temperature will always affect the rate of cure. For example, temperatures below 60°F will slow the cure rate; above 80°F will increase cure rate. 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. Plexus does not recommend bonding below 60°F.

STORAGE AND SHELF LIFE:

The shelf life of MA205HV is currently under investigation. However, ITW Plexus anticipates its shelf life not to be less than 9 months from date of manufacture. Shelf life is based on continuous storage between 55°F and 75°F. Long-term exposure above 75°F will reduce the shelf life of these materials. Prolonged exposure of activators, including cartridges that contain activators, above 100°F quickly diminishes the reactivity of the product and should be avoided. This product should never be frozen.

Notes

1. ITW Plexus strongly recommends that all substrates be tested with the selected adhesive in the anticipated service conditions to determine suitability. For severe corrosion durability to metals, use of PC120 offers superior durability and performance.
2. Working Time: The time elapsed between the moment when Parts A and B of the adhesive system are combined and thoroughly mixed and the time when the adhesive is no longer useable at approximate 0.25 inches. Times presented were tested at 75°F.
3. Fixture Time: Varies with ambient temperature, bondline gap thickness, and nature of substrates. Typically at 75°F, MA205HV with 0.012-inch gap at a 10:1 ratio by volume reaches 500 psi in 9 minutes and 1,000 psi in 10 minutes on polycarbonate (ASTM D1144). Substrate, temperature and gap may also affect fixture time.
4. Although not necessary, ITW Plexus recommends the removal of all oxides on the metal surface.
5. (a) Cure condition for lap shear and T-peel samples: 4 hrs. RT, then 16 hrs. at 110 °F, and finally 4 hrs. at RT. Crosshead speed for lap shear testing was 0.05 inch/min. Overlap was about 0.5 inches. There is no surface treatment. ASTM D1002 for lap shear and ASTM D1876 for T-peel are followed. SF-Substrate Failure; CF-Cohesive Failure. (b) Thickness of the ABS is 0.116 inches. (c) Thickness of the PC (polycarbonate) is 0.096 inches. (d) Thickness of the Al 6061 is 0.058 inches. (e) Thickness of the Al 6061 is 0.029 inches.
6. In a typical bond line, exotherm temperatures will be lower than the temperatures shown.