

Description

Two-component methyl methacrylate adhesive with a medium cure time. Formulated for bonding metals to be electrostatically powder coated, it bonds a wide range of plastics, metals and composite materials. It is resistant to impact and aging. M480 is flexible, resists temperature fluctuations, has high resistance to a wide range of chemicals and environmental conditions.

- Requires little or no initial preparation of the parts to be bonded.
- Excellent bond strength, impact and fatigue resistance.
- It is easy to apply, does not drip, is thixotropic and cures at room temperature.
- Open time 4 to 6 minutes, working time 15 to 18 minutes.
- Resistant to baking temperature and electrostatic paint line cleaning process.
- Ideal for automotive applications, thermoformed parts, household appliances, electrical components, signs, metal parts and furniture.

Application

Metals: carbon steel, stainless steel, aluminum, anodized aluminum.

Thermosetting plastics: fiberglass, phenolics, coating resins, epoxies, polyurethane, rigid urethane, carbon fiber.

Thermofluid plastics: Acrylics, ABS, Polycarbonate, Nylon, PPO, Vinyl, PVC, Styrene, RIM, PBT.

Physical properties of the product in liquid state:

Resin viscosity @77°F	250,000 – 350,000 cP
Activator viscosity @77°F	100,000 – 200,000 cP
Density of the mixture (Lbs/gal)	8.10
Mixing ratio by weight (Kg/L)	0.97
Mixing radius per volume	10:1
Flash Point	51 °F

Physical properties of the product in solid state:

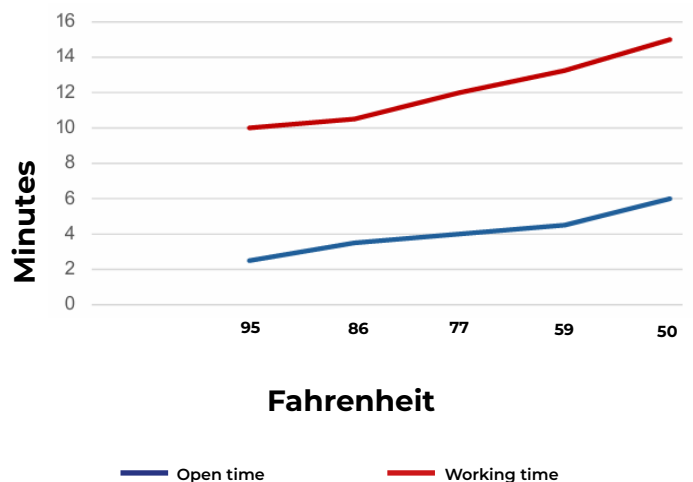
Open time	4 to 6 min
Working time	15 to 18 min
Filling capacity	9 mm
Elongation	50%
Modulus, ASTM D638	125,000 to 200,000 psi
Tensile strength, ASTM D 638	3,200 - 3,500 psi
Impact resistance	21 ft.lb/in
Hardness ASTM D 2240	73D
Operating temperature range	-40 to 250 °F
Color	Black
Bake temperature	400 °F for 1 hour

Overlap shear strength according to ASTM D 1002:

Substrates	Shear strength and failure type
Stainless steel / Stainless steel	3100 psi (21 MPa) - Cohesive failure
Aluminum / Aluminum	2,910 psi (20 MPa) - Cohesive failure
ABS / ABS	1200 psi (8 MPa) - Substrate failure
FRP / FRP	1700 psi (12 MPa) - Fiber tear

Note: The shear strength in plastics is lower due to substrate failure, which means that the bond strength is higher than the strength of the plastic.

Room temperature curing time



Environmental resistance

This adhesive has excellent environmental resistance according to the following test:

Tensile strength measurement according to ASTM D 1002 on stainless steel bonded with stainless steel. Environmental resistance test for 30 days with the following cycles: 8 hours at -22 °F, 8 hours at 185 °F and 8 hours at 86 °F with 100% relative humidity.

Condition	Overlapping shear strength
Initial	3180 Psi (22 MPa) - Cohesive failure
30-day environmental test	3,200 Psi (22 MPa) - Cohesive failure

The shear strength is increased after the environmental resistance test.

Chemical resistance

Chemical resistance testing of the ADINOX M480 adhesive was performed by bonding two aluminum sheets and the assembly was allowed to cure for 7 days at 77 °F, after which, the assembly was immersed for 30 days in the chemicals listed below. After the 30 days of immersion, tensile strength measurement was performed in accordance with ASTM D 1002.

Chemical	Overlap shear strength, strength, in PSI ASTM D 1002
Gasoline	3180 (22 MPa)
Acetic acid (10%)	3120 (21 MPa)
Xylene	3150 (21 MPa)
Lubricating oil HD30	3240 (23 MPa)
Kerosene	2950 (20 MPa)
Water at 73 °F	3100 (22 MPa)
Water at 194 °F	3000 (21 MPa)

Cautions

Adhesive component A contains methyl methacrylate monomer and should therefore be applied in well ventilated areas. Adhesive component B contains peroxide. Both materials should be stored in a cool, dry place, away from sources of heat, flame or sparks. Keep adhesive covered when not in use. Keep out of reach of children.

Note: The chemical reaction that occurs when the two materials are mixed generates heat. The amount of heat generated depends on the mass and thickness of adhesive applied. Large amounts of adhesive (over 1.5 cm thick) can generate temperatures above 250 °F, with the possibility of emitting toxic gases and flammable vapors.

Application

It is recommended to apply the adhesive directly from the cartridge using a mixing nozzle. The dispenser can be manual or pneumatic. In semi-automatic or automatic dispensing equipment, contact of the adhesive with copper, zinc, bronze and other alloys containing these materials should be avoided. The seals of these equipments should be made of PTFE or UHMW polyethylene.

Surfaces to be bonded should be clean, dry and free of grease. Higher bond strengths are obtained on materials that have been lightly sanded. Always purge the adhesive cartridge before inserting the mixing nozzle and remove some of the mixed material from the nozzle to ensure that properly mixed adhesive is applied to the parts to be bonded.

Apply enough adhesive to ensure that the space between the two pieces to be glued is completely filled. Ensure that the parts to be bonded do not move while the adhesive reacts and the specified handling time for the adhesive is met.

Glossary

1) Open time. It is defined as the time available to perform the assembly counted from the moment the adhesive is mixed.

2) Working time. It is defined as the approximate time that the assembled parts must be left without movement for the adhesive to achieve sufficient bond strength to move the assembly carefully and/or remove the clamping tools.

3) Electrostatic Powder Coating. A coating method in which a powder paint is applied to a surface by means of an electric charge.

4) Elongation. This parameter measures the ability of an adhesive to stretch before fracturing, which is vital to its performance in various applications.

5) Cohesive failure. Occurs when failure occurs within the adhesive itself, rather than at the adhesive-substrate interface. adhesive itself, rather than at the interface between the adhesive and the substrate. means that the adhesive has bonded properly to both surfaces, but the force applied is so great that it breaks the adhesive itself.

6) Substrate failure. Occurs when the failure occurs within the substrate material rather than the adhesive. substrate material rather than the adhesive. This type of failure indicates that the adhesion between the adhesive and the substrate is so strong that the substrate itself breaks before the adhesive breaks before the adhesive peels off.

Storage

Store in a dry and cool place with temperature between 54 and 75 °F. Storage above 75 °F for long periods of time reduces the shelf life of the adhesive. This adhesive should not be frozen.

Note: The data are provided for information purposes only and in accordance with the studies carried out, the data shown here are obtained following the application instructions and under optimum product conditions. We cannot assume responsibility for results obtained by others whose methods we do not control. It is recommended that the product be tested in the application for which it is to be used. For more information about this or any other product, please contact our technical area by e-mail to info@adinoxadhesives.com It is important to properly follow the instructions for use specified on the label.