ADINOX®
METAL BONDING SOLUTIONS

Technical Data Sheet
ADINOX® M410
23/01/2025

Description

ADINOX M410 is a two component adhesive with a 10:1 mix ratio, low odor and very low shrinkage during cure. It is specially formulated for bonding metals, composites, thermoset plastics and thermo-flowable plastics.

It provides very high bond strength, very durable, with excellent impact and environmental resistance. This adhesive resists temperature cycling, is flexible and resistant to a wide variety of chemicals.

- Requires little or no initial preparation of the parts to be bonded.
- Excellent bond strength, impact and fatigue resistance.
- It is easy to apply, non-drip, thixotropic and cures at room temperature.
- Open time 2 to 4 minutes, working time 6 to 8 minutes.
- Ideal for automotive applications, thermoformed parts, household appliances, electrical components, signs and advertisements, metal parts and furniture.

Application

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

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

Thermo-fluid plastics: Acrylics, ABS, Polycarbonate, Nylon, PPO, Vinyl, PVC, Styrene, RIM, PBT.

Physical properties of the product in liquid state:

Resin viscosity @77°F	160,000 – 200,000 cP
Activator viscosity @77°F	60,000 – 80,000 cP
Density of the mixture (Lbs/gal)	8.10
Mixing ratio by weight (Kg/L)	9:1
Mixing ratio by volume	10:1
Flash point	51 °F

Physical properties of the product in solid state:

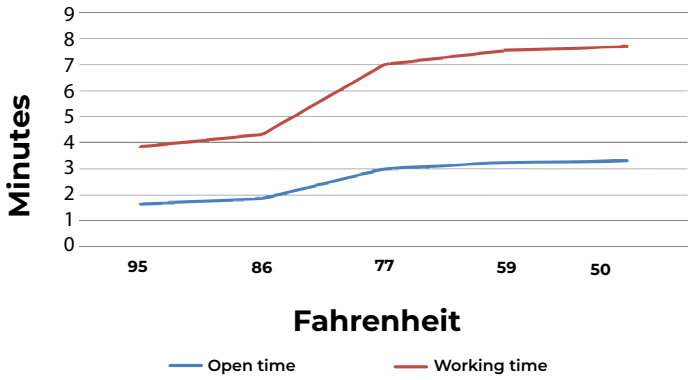
Open time	2 to 4 min
Working time	6 to 8 min
Filling capacity	15 mm
Elongation	80%
Modulus, ASTM D638	70,000 to 90,000 psi
Tensile strength, ASTM D 638	1,800 to 2,500 psi
Impact strength	22 ft.lb/in
Hardness (ASTM D 2240)	65D
Operating temperature range	-40 to 250 °F
Color	White

Overlap shear strength according to ASTM D 1002:

Substrates	Shear strength and type of failure
Stainless steel / Stainless steel	2,650 a 2,980 psi – cohesive failure
Aluminum / Aluminum	2,300 a 2,755 psi – cohesive failure
ABS / ABS	950 a 1,350 psi – substrate failure
Fiberglass / Fiberglass	900 a 1,850 psi – fiber rupture
Aluminum / ABS	1,750 a 2,050 psi – substrate failure

Note: the tensile 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	2,650 a 2,950 psi
30-day environmental test	2,550 a 2,900 psi

Tensile strength is increased after the environmental resis tance test.

Chemical resistance

Chemical resistance testing of the ADINOX M410 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	Overlapping shear strength, strength, in PSI ASTM D 1002
Gasoline	2,450 a 2,755 psi
10% solution of water and acetic acid	2,425 a 2,750 psi
Xylene	2,400 a 2,720 psi
Lubricating oil HD30	2,450 a 2,775 psi
Kerosene	2,350 a 2,750 psi
Water at 73 °F	2,450 a 2,745 psi
Water at 194 °F	2,425 a 2,750 psi

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. Acoating 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. substratematerialratherthantheadhesive.Thistypeoffailure indicates that the adhesion 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 12 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.