Technical Data Sheet
MXBON® 21406M

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PRODUCT DESCRIPTION

The **MXBON® 21406M** is α-cyanoacrylate adhesive, and it is specially formulated for the assembly of difficult-to-bond materials. It will highly polymerize with moisture in the air for a fast cure and meet the highest industrial standards. **MXBON® 21406M** product does not contain solvent and use in demanding applications where exceptional performance characteristics are required. They include resistance to most types of environmental exposures, moderate heat, aging and many different chemicals, as well as high strength and fatigue resistance. **MXBON® 21406M** is a single component system and does not require heat, mixing, clamps and the use of a catalyst. When a thin layer of **MXBON® 21406M** applied between two surfaces comes into contact with atmospheric moisture, a rapid polymerization occurs producing the ultimate bond strength. It is attractive not only technically but economically.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Base	Ethyl 2-Cyanoacrylate
Appearance (uncured)	Transparent, colorless to yellowish colored liquid
Components	Single part – requires no mixing or heating
Specific Gravity @ 25°C	1.1
Cure	Moisture
Flash point	See SDS
Application	Bonding
Viscosity, Brookfield @25°C mPa · s (cP)	15-40 (ISO 3104/3105)
Service temperature range	-54~121°C (-65~250°F)
Full cure (hrs)	24
Shelf life	18 months unopened when stored at 2-8°C

*Keep in a cool area out of direct sunlight. Refrigeration to 2-8°C gives optimum storage stability. When stored in a refrigerator, allow the adhesive to gradually warm to room temperature prior to use. It will prevent condensation inside the bottle which can reduce shelf life. Containers should be tightly sealed when not in use. The shelf-life is 18 months from date of manufacture.

ISO 10993-5

MXBON® 21406M has been tested to test protocols based on ISO 10993-5 biocompatibility standards, as a means to assist in the selection of products for use in the medical device industry.

TYPICAL CURING PERFORMANCE

The rate of cure can be affected by temperature, humidity, the smoothness of the surface, the closeness of the surface and specific surfaces being bonded. Although full functional strength is developed in a relatively short time, curing continues for at least 24 hours before full chemical/solvent resistance is developed.

Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. Acidic surfaces such as paper and leather may have longer cure times than most plastics and rubbers. Some plastic with very low surface free energies, such as polyethylene, polypropylene, PTFE and silicone rubber may require the use of a primer. The table below shows the fixture time achieved on different materials at 25°C/50% RH. This is defined as the time to develop shear strength of 0.12 N/mm^2 (1.2 kgf/cm^2) and the strength keeps at least 10 seconds.

Bonding Identical Substrate	Fixture time , seconds
Mild steel	<10
Aluminum A5754	<10
ABS (Acrylonitrile Butadiene Styrene)	<5
PVC(Polyvinyl chloride)	<5
PC(Polycarbonate)	10 to 15
Oak wood	20 to 30
Pine wood	15 to 20
Beech wood	<10
NBR(Nitrile-Butadiene Rubber)	10 to 15
Paper	<5

Cure Speed vs. Bond Gap

The rate of cure will depend on the bond line gap. A thinner bond line will give faster polymerization and a strong bond. Large bond gaps will result in a slower cure and lower bond strength. Cartell Activator may be used to increase cure speed.

Cure Speed vs. Activator

Cartell Cyanoacrylate Activators may be used in conjunction with Cartell Cyanoacrylate Adhesive where cure speed needs to be accelerated. Cure speeds of less than 2 seconds can be obtained. The use of an activator may reduce the final bond strength. If bond strength is critical testing on the parts is recommended to measure the effect. When using the activator apply it to one side of the bond and the adhesive to the other.

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 72 hrs @ 25°C
Lap Shear Strength, ISO 4587/ASTM D1002/JIS K6850

Bonding Identical Substrate	kgf/cm^2	N/mm^2	psi
GBMS (Grit Blasted Mild Steel)	267.4	26.2	3803.3
Aluminum A5754	80.6	7.9	1146.4
ABS	90.1*	8.8*	1281.5*
PVC(Polyvinyl chloride)	99.2*	9.7*	1411.0*
PC(Polycarbonate)	111.5*	10.9*	1585.9*
NBR(Nitrile-Butadiene Rubber)	6.5*	0.6*	92.5*

* substrate failure

Important Notice: Strength results will vary depending on the level of surface preparation and gap.

Cured for 72 hrs @ 25°C
Block Tensile Strength, ISO 6922/ASTM D2095/JIS K6849

Bonding Identical Substrate	kgf/cm^2	N/mm^2	psi
Stainless Steel	365.6	35.9	5200.1

Cured for 72 hrs @ 25°C
Side Impact Strength, ASTM D950

Bonding Identical Substrate	kJ/m^2	ft-lb/in^2
Stainless Steel	3-5	1.4-2.4
Aluminum	3-5	1.4-2.4

Physical Properties

Cured for 24 hrs @25°C

Coefficient of Thermal Expansion, ISO 11359-2, mm/mm/K	90 × 10^{-6}
Coefficient of Thermal Conductivity, ISO 8302, W/mK)	0.1
Glass Transition Temperature, ISO 11359-2, °C	150
Hardness, ISO 868, Shore D	83

Electrical Properties

Cured for 24 hrs @25°C

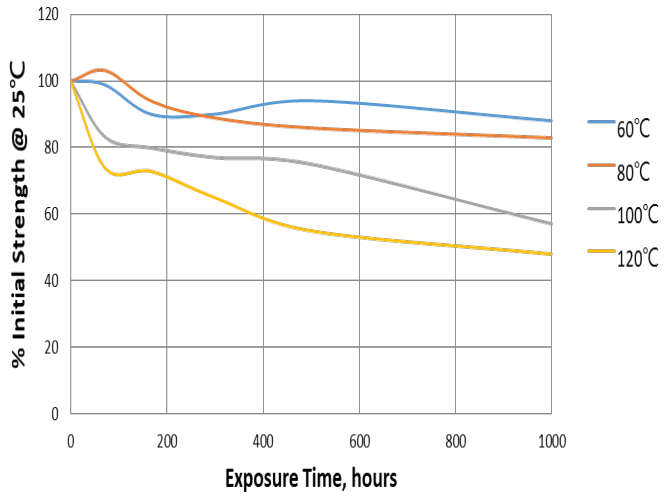
Dielectric Constant, IEC 60250, @ 10kHz	2.5
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	25
Surface Resistivity, IEC 60093, Ω	5-9 × 10^{15}
Volume Resistivity, IEC 60093, Ωcm	5-9 × 10^{15}
Dielectric Dissipation Factor, IEC 60250, @ 10kHz	<0.025

TYPICAL ENVIRONMENTTAL RESISTANCE

Cured for 1 week @ 25°C
Lap Shear Strength, ISO 4587/ASTM D1002/JIS K6850
GBMS (Grit Blasted Mild Steel)

Heat Aging

Aged at temperature indicated and tested @25°C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @25°C

Environment	Temp. °C	% of initial strength 100 hrs	500 hrs	1000 hrs
Water	25	94	91	80
Ethanol	25	103	97	96
Isopropanol	25	105	109	100
Water/Glycol	25	100	102	97
Unleaded Gasoline	25	95	92	94
Motor Oil	25	99	98	92
98% Relative Humidity	40	93	91	78

Chemical/Solvent Resistance

Aged under conditions indicated and tested @25°C
Lap Shear Strength, ISO 4587/ASTM D1002/JIS K6850
PC (Polycarbonate)

Environment	Temp. °C	% of initial strength 100 hrs	500 hrs	1000 hrs
Air	25	101*	103*	102*
98% Relative Humidity	40	92*	97*	92*

*substrate failure

GENERAL INFORMATION

Additional information

This product is not recommended for use in contact with strong oxidizing materials and polar solvents although will withstand a solvent wash without any bond strength deterioration. Users are reminded that all materials, whether innocuous or not, should be handled in accordance with the principles of good industrial hygiene. Full information can be obtained from the Safety Data Sheet (SDS).

Directions for use:

1) Make sure the surfaces to be bonded are clean, dry and grease-free before applying the adhesive.
2) Dispense a drop or drops to one surface only.
3) Bring the components to together quickly and correctly aligned.
4) Apply sufficient pressure to ensure the adhesive spreads into a thin film.
5) Do not disturb or re-align until sufficient strength is achieved, normally in a few seconds.
6) Any surplus adhesive can be removed with solvent, such as nitromethane or acetone.
7) Because **MXBON® 21406M** condenses by polymerization, sometimes blooming will occur on the surface of the container or the bonded materials. Should this happen, wipe surface well with acetone or nitromethane.
8) Product should be allowed to develop full strength before subjecting to any service loads (typically 24 to 72 hours after assembly, depending on bond gap, materials and ambient conditions).

Storage

Keep in a cool area out of direct sunlight. Refrigeration to 2-8°C gives optimum storage stability. When stored in a refrigerator, allow the adhesive to gradually warm to room temperature prior to use. It will prevent condensation inside the bottle which can reduce shelf life. Containers should be tightly sealed when not in use. Product removed from containers may be contaminated during use. Do not pour back any product to the original container. Misuse of product will void all warrantees. The shelf-life is 18 months from date of manufacture.

PRECAUTIONS

1) Use with proper ventilation. Avoid contact with skin and eyes.
2) If contact with skin occurs, rinse with warm water or dissolve gradually with solvent such as acetone or nitromethane. Do not try to remove forcibly.
3) If adhesive gets into eye, keep eye open and rinse thoroughly. Seek medical attention immediately.
4) Keep well out of reach of children.
5) Keep adhesive in a cool, dry location and out of direct sunlight. For long-term storage, refrigeration(2-8°C) is recommended.
6) When take out the product form refrigerator, please allow adhesive to reach room temperature before opening bottle to prevent condensation inside the bottle which can reduce shelf life.

Important Notice:

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