Polymer Composites Incorporated

TECHNICAL DATA SHEET
MAX MCR A/B

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DESCRIPTION

MAX MCR A/B is an epoxy based resin system used for encapsulation or potting compound of electronic circuitry. It is an unfilled, medium working time casting resin that offers a good balance of working time and cure time. MAX MCR A/B cures at room temperature as well as elevated temperatures for faster processing. It cures to a hard but tough compound that is suitable for potting or encapsulating small to medium parts without excessive exotherm. It has a 30 minute working time when mixed up to 200 grams. It is low in viscosity and offers a fast wet-out and bubble-free encapsulation. MAX MCR is mixed 2 to 1 by weight or by volume and is easily poured in place.

GENERAL USAGE

MAX MCR A/B can be used as casting or tooling resin that requires good physical strength and dimensional stability over a wide temperature range. It can also be utilized as a general-purpose adhesive, potting or encapsulating compound for electronic circuitry to impart a hermetic seal against gaseous and liquid compounds. It is also utilized to mask proprietary circuitry in printed circuit boards and similar components.

MIXING INSTRUCTIONS

Dispense 100 parts of Part A and 50 parts of Part B and mix thoroughly until a homogonous consistency is achieved. Mix for 1-minute by scrapping the bottom and side of the container. To insure a complete and thorough mixing, transfer the mixed resin into another container and continue to mix for another minute. Use or apply the material within 30 minutes. Do not allow a large volume of mixed material to collect and cure in a confined mass. High exothermic temperature may develop causing uncontrollable reaction and cause skin burns and noxious fumes.

For mix metering application, ensure that a 2:1 flow rate of Part A and Part B respectively is achieved. A 24 element static mixer provides excellent mix results. Attach the static mixer and dispense and discard approximately ½ ounce of the mixed material before using the mixed resin. Dispense the material in one corner of the component casing and allow the material to completely flow through out. This technique will reduce voids and air entrapment.

For casting or tooling applications

Prepare mold by cleaning and applying a good quality wax mold release or PVA parting film. If using PVA parting film, allow the PVA to dry completely and make sure that the mold is secured on a level plane. Measure out the proper amounts Part A and Part B based on a 2 to1 by weight or volume mix ratio in a clean container. Gently mix until a uniform consistency is achieved (2 minutes). Do not mix aggressively to avoid excessive air entrapment. Transfer the mixture into another clean container and continue mixing for another minute. This will guarantee a thorough mixture. Slowly pour the mixture in the prepared mold unaided to minimize air entrapment. To remove stubborn air bubbles from the surface, use a hot air gun or a propane torch and pass it very quickly over the surface.

For Encapsulating Electronic Parts

Premix the Part A and Part B into a container and then pour the mixed component into another clean container and mix for another minute. This will insure a thoroughly mixed resin is achieved. Pre arrange the wire leads to the desired position and secure. Pour the mixed MAX MCR A/B into the component housing to be encapsulated insuring complete and level coverage. Pour or dispense only from one corner of the component casing and allow the material to completely flow and fill through out the casing. This technique will reduce voids and air entrapment.

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GENERAL CURING

Allow to cure at room temperature; depending on the ambient temperature cures times can vary from 24 to 36 hours. If available, use a Durometer to determine the cured hardness; a reading of 65 D will be sufficient for demolding or handling. To check handling properties attempt to indent the casting with using your fingernail, if it does not indent then it is ready for demolding or can be handled. For a faster thorough cure process, allow the casting to set-up for 2 hours at room temperature then post cure in an oven for 2 hours at 200oF. Allow it to cool.

PHYSICAL PROPERTIES

Viscosity Part A	2,500 cPs at 25 °C
Viscosity Part B	750 cPs at 25 °C
Mixed Viscosity	2,850 cPs at 25 °C
Mix Ratio By Weight	100 Parts A to 50 Parts B (2:1)
Mix Ratio By Volume	100 Parts A to 50 Parts B (2:1)
Mixed Density	1.10 g/cc
Working Time	30 minutes (200 gram mass)
Peak Exotherm	140°C max (200 gram mass)
Cure Schedule	8 Hours Dry To The Touch at 25°C
	12 Hours Demold Time at 25°C
	24 Hours -90% Cure
	96 Hours Full Cure Time At 25°C
Accelerated Cure	Allow To Cure For 3 Hours @ 25°C Then Post Cure at 120°C for 1 hours

MECHANICAL PROPERTIES

Shore Hardness	75- 80 Shore D
Shrinkage	<0.50 % Upon Full Cure
Compressive Strength	13,800 psi
Tensile Strength	9,900 psi
Tensile Elongation	4% Maximum
Heat Distortion Temperature	110°C

ELECTRICAL PROPERTIES

Volume Resistivity	4.7 X 10^{13} Ohms-Cm
Dielectric Strength-60 Cycles	500 Volts/Mil
Dielectric Constant	4.0 (10 kHz)
Dissipation Factor	.014 (10 kHz)

PACKAGING AND STORAGE

MAX MCR A/B is available in use size kits, 5-gallon, and 55-gallon kits; special packaging requests are also available.

Replace lid and seal tightly and store in a dry place. Store containers between 20°C to 33ºC; do not store below 10°C as the resin component or PART A may crystallize.

If resin crystallization occurs, the PART A or resin component must be heat processed to revert the solidified resin into a liquid.

If the MAX MCR A/B has been stored for over 4 months, the resin component may have solidified and must be heat processed as described below. Both Resin and Curing Agent components must be in a liquid form to form a uniform mixture when mixed. MAX MCR A/B is guaranteed for 12 months from the date of shipment.

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COLD WEATHER NOTICE & RESIN CRYSTALLIZATION

During the colder months, the resin and curing agent should be warmed to at least 21°C to 27°C (75°F to 80°F) before use to reduce its viscosity and cure as noted in the physical properties table.

The cold temperature exposure can occur during transport or delivery of the kit were the package can be exposed to temperatures below 10°C (50°F) and initiate the resin to crystallize or develop seed crystals. The resin component may also crystallize after prolonged storage and should be heat processed before use and ensure proper cure.

Once a seed crystal develops, crystallization will continue even if stored at the proper storage temperature. Do not throw away or use the resin until it has been melted back to a free-flowing liquid phase by gentle heating 120°F to 150°F. The high purity epoxy component and the absence of any accelerators and other non-reactive impurities in its formulation are some of the many key factors that control its high-performance properties. The cold temperature will also make the resin much thicker than the stated viscosity and lengthen the working-time values as stated on the physical tables.

Inspect the Resin Component or PART A for any solidified chunks or graininess; this is an indication of RESIN CRYSTALLIZATION.

Clear Resin Used For Reference And Illustration

DO NOT USE UNLESS PROCESSED

The crystallized or solidified resin component will appear as a white wax-like consistency, which will not combine with the curing agent to form a uniform mixture.

COMMON AND NOTICEABLE THE EFFECTS OF COLD TEMPERATURE EXPOSURE

- Higher or thicker viscosity
- Less accuracy in volumetric measurement due to its thicker consistency
- Crystallized or solidified resin component; it appears as a white wax-like consistency
- More bubble entrapment during mixing
- Slower reactivity
- Longer cure times
- Lower cured performance due to none full cure polymerization

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The crystallization can be reversed with no adverse affect on its cured mechanical performance or shelf life. Simply warm the resin gently by placing it in a sealed plastic bag and immerse it in hot water bath or a warm environment at 75°C to 90°C (167°F to 194°F) for 30 minutes or until the resin is again a uniform liquid.

Allow the PART A to acclimate to room temperature until it is uniformly 23ºC TO 27ºC before adding the curing agent. Mixing the resin and curing agent above 30ºC will cause rapid polymerization and generate high exothermic heat that can exceed 145ºC in mass.

To counter act the affects of the cold temperature exposure, warm the resin gently by placing it in a plastic bag and immerse it in hot water or a warm room and allow it to acclimate until it is a very clear and liquid in consistency allow the resin to cool 23°C (75°F to 80°F) maximum before adding the curing agent.

IMPORTANT NOTICE

This product is for industrial use only. Please review all precautions before using this product. As with all products of the same nature, avoid prolonged inhalation and repeated skin contact. Always wear safety goggles and impervious rubber gloves when handling this material. Large mass curing of this product is not recommended for it may produce noxious fumes.
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