Product Datasheet

SP&S Specialty Polymers and Services

EpoPro 283FR-A/283B

Room Temperature Curing, Flame Retardant Epoxy Encapsulant

EpoPro® 283FR–A/B is a high performance, room temperature curing epoxy system for potting and encapsulation of electrical and electronic components requiring flame retardance. This is a version of our standard EpoPro 283A/B system that has additives that provide improved anti-fungal, antibacterial, and mold-resistance properties. It contains additives that kill microbes and fungi on the polymer surface and this prevents fouling of the cured polymer's surface under most conditions.

Suggest applications include military rated electronic devices, voltage regulators, relays, sensors and toroidal transformers. This system provides has a convenient mix ratio by weight and volume and is insensitive to small variations in mix ratio. EpoPro® 283FR-A/283B is semi-flexible when cured and exhibits minimal shrinkage and low exotherm during its curing process. This makes the system suitable for use with many stress and heat sensitive components. When fully cured, the system has good chemical, environmental and heat resistance as well as excellent insulating properties. EpoPro® 283FR-A/283B is fully compliant with all RoHS and REACH regulations.

Alternate hardeners are available to achieve faster or slower cures than the standard EpoPro 283FR-A/283B system. Custom colored and viscosity modified systems are also available upon request. Please contact us to discuss your application if you think a modified version might be helpful for your application.

TYPICAL APPLICATIONS

- General potting of electronic devices
- Potting of fine wire wind devices
- Sealing voids and cracks

HANDLING PROPERTIES

	VALUE	TEST METHOD
EpoPro 283FR-A		
Appearance	Black Liquid	
Density, g/cm³	1.72	ASTM E-201
Viscosity at 25ºC, cps	55,000	ASTM D-2393
EpoPro 283B		
Appearance	Amber Liquid	
Density, g/cm³	0.96	ASTM E-201
Viscosity at 25ºC, cps	900	ASTM D-2393
Mix Ratio By Weight	100A:25B - 30B	Calculated
Mix Ratio By Volume	100A:50B	Calculated
Viscosity Mixed at 25ºC, cps		ASTM D-2393
Mix ratio 100A:25B	6,400	
Mix ratio 100A:30B	4,800	
Gel Time at 25ºC, 100g mass	40-60 minutes	ASTM D-2471

Recommended Cure Schedules:	24 hrs. at 25ºC **or** allow to gel (~60 min at 25ºC) then cure for 4 hrs. at 65ºC or 2 hrs. at 80ºC

PHYSICAL PROPERTIES

	VALUE	TEST METHOD
Color	Black*	Visual
Density, g/cm³	1.46	ASTM E-201
Shore Hardness	78D	ASTM D-2240
Tensile Strength, psi	2,100	ASTM D-638
Tensile Elongation at break	25%	ASTM D-638
Glass Transition Temp. (Tg)	50ºC	
Coefficient of Thermal Expansion	76 ppm/ºC (below Tg)	ASTM E-381
Thermal Conductivity	0.65 W/mK	ASTM D-2214
Flame Retardance	Self-extinguishing - complies with UL 94V0 at 6mm	

*Black, white, and custom colors available by request.

ELECTRICAL PROPERTIES

	VALUE	TEST METHOD
Electrolytic Corrosion	Grade A-1	DIN 53489
Dielectric Strength, V/mil	>550	ASTM D-149
Volume Resistivity, ohm-cm	1.2×10^{15}	ASTM D-257
Dielectric Constant, 60 Hz / 1 MHz	5.2 / 3.2	ASTM D-150
Dissipation Factor, 60 Hz / 1 MHz	0.01 /0.03	ASTM D-150

NOTE : Typical Properties determined using EpoPro 283FR-A/283B cured for 1 hour at 25ºC + 4 hours at 65 ºC using mix ratio of 100A:25B. Values are based on laboratory or average production results – not for specification purposes.

SUGGESTED PROCESSING GUIDELINES:

EpoPro 283FR-A/283B can be applied by pouring, brushing, injection from a syringe, or dipping components into the mixture. It is also suitable for meter-mix dispensing and can be supplied in premixed and frozen syringes for small volume applications.

The EpoPro 283FR-A is a filled may settle or separate during shipment or storage. Be sure to thoroughly re-mix the 283FR-A prior to use using a spatula or by placing on a paint shaker for 5-10 minutes. When ready to use, weigh the resin and hardener in the recommended ratio as accurately as possible into a clean mixing container. Always use weighing equipment having accuracy in proportion to the amounts being weighted – ideally the accuracy of the scale should be less than 1% of the mass being weighed. Blend by using a stainless steel spatula or stirring stick for 2-3 minutes using a figure eight motion. Scrape the bottom and sides of the mixing container carefully and frequently to produce a uniform mixture. For bubble free parts, vacuum degas the mixture prior to use at 29 inches of mercury or greater. For best adhesion apply to clean, dry surfaces.

Please note that the EpoPro 283FR-A/283B system can be used at a weight ratio of 100 parts A to 25 - 30 parts 283B. The 100A:25B ratio will give the most chemical and heat resistance to the cured parts but is a bit higher in viscosity. The 100A:30B by weight mix ratio will be more fluid

and produces a cured part that is a bit more flexible. Any mix ratio between 100A:25B and 100A:30B by weight will produce a cured polymer with excellent insulating properties and very good mechanical performance.

STORAGE GUIDELINES:

Store these materials in a clean, cool, and dry environment in their tightly closed original containers. The 283FR-A resin may settle or separate during storage and should be thoroughly re-mixed prior to use. Avoid extended exposure to high humidity. Tightly re-seal after use. If the recommended storage conditions are observed the products will have a minimum shelf-life of 12 months from the date of shipment.

HANDLING PRECAUTIONS:

Mandatory and recommended industrial hygiene procedures should be followed whenever these products are being handled and processed. For additional information please consult the corresponding material safety data sheets.

PERSONAL HYGIENE:

EpoPro 283FR-A

WARNING! May cause eye irritation. Prolonged or repeated skin contact may cause irritation, may cause allergic skin reaction. Avoid contact with eyes, skin, or clothing. Wear eye protection and impervious gloves when handling. Wash thoroughly after handling. Avoid breathing vapor or mist. Keep containers closed when not in use. Use only with adequate ventilation. Do not take internally.

EpoPro 283B

WARNING! May causes skin and eye irritation. May cause allergic skin and respiratory reactions. Harmful if inhaled or swallowed. Do NOT get in eyes, on skin, or clothing. Wear chemical splash goggles and impervious gloves when handling. Wash skin and clothing thoroughly after handling. Avoid breathing vapor or mist. Use only with adequate ventilation. Keep containers closed when not in use. Do NOT take internally.

FIRST AID

In case of contact:

Skin – Immediately wash skin thoroughly with mild soap and water. Remove contaminated clothing and wash before reuse. Destroy contaminated shoes and other articles made of leather.

Eyes – Immediately flush eyes with plenty of water for 15 minutes and get prompt medical attention.

Inhalation - Remove person to fresh air. Administer oxygen or artificial respiration if necessary. Call a physician.

Ingestion - Do not induce vomiting. Dilute with plenty of water and contact physician immediately. Never give anything by mouth to an unconscious person.

DISCLAIMER:

IMPORTANT: The following supersedes Buyer's documents. **SELLER / MANUFACTURER MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE**. No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller / Manufacturer be liable for incidental, consequential or indirect damages for alleged negligence, breach of warranty, strict liability, tort or contract arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results presented are based on controlled or laboratory work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has not been tested for, and is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended; or for uses for which implantation within the human body is intended.

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