

## EpoPro<sup>®</sup> 232FR

### 1 COMPONENT, FLAME RETARDENT EPOXY RESIN – CLASS H

EpoPro<sup>®</sup> 232FR is 1-part epoxy system that is excellent for potting, brush-on, and trickle impregnation applications. It features a heavy build and high resin retention. When cured the resin is semi-flexible and offers excellent room temperature storage stability. It also provides exceptional impact and thermal shock resistance, conform to the UL 94VO flame retardance standard, and provides a high thermal conductivity. EpoPro 232FR is a heat curing resin and is vacuum stable so that impregnation can occur under high vacuum without volatilization of any resin components. The resin is solvent free and has zero volatile organic compounds (VOCs). The EpoPro 232FR demonstrates excellent adhesion to most materials and provides very good chemical and heat resistance.

The EpoPro 232FR resin is available in a standard opaque beige color or in colors such as black, red, or white. Many other custom variations are available including rubber toughened, increased flexibility, and accelerated versions that offer shorter cure times. Many other modifications can be designed to suit your application or production process. Please contact us to discuss your application if you would like to receive samples of a modified system that would better suit your application.

#### **SUGGESTED APPLICATIONS:**

- Solvent and VOC free
- Heavy build / high resin retention
- Conforms to UL 94VO flame retardance requirements

<b>HANDLING PROPERTIES</b>	<b>VALUE</b>	<b>TEST METHOD</b>
<u>EpoPro 232FR</u>		
Visual Appearance	opaque beige	Visual
Density	1.30 g/cm <sup>3</sup>	ASTM E-201
Viscosity at 25°C	40,000 – 60,000- cps	ASTM D-2393
Flash Point	>100°C	ASTM D-92

Mix Ratio (part by weight)	1 component / No –mix system
Shelf-life	at least 6 months at 25°C or at least 9 months at 5°C
Pot life (100 grams) at 150°C	10 – 20 minutes
Cure Schedules:	24 hours at 160C hours <b>or</b> 10 hours at 110°C*
*Note: many other cure schedules are possible. Please contact us for assistance if you would like to use an alternate cure schedule.	

<b>PHYSICAL PROPERTIES</b> (Tested at 25C unless otherwise noted – cured 2 hours @ 150C)		
		<u>TEST METHOD</u>
Appearance	Opaque Beige	Visual
Hardness, Shore D at 25°C	90-95	ASTM D-2240
Tensile Strength	4,000 – 6,000 psi	ASTM D-638
Tensile Elongation	5.0%	ASTM D-638
Flexural Strength	11,000 – 15,000 psi	ASTM D-638
Glass Transition Temperature (Tg)	115°C	ASTM D-648
Coefficient of Thermal Expansion (CTE):		ASTM E-831
below Tg / above Tg (ppm/°C)	60 / 135	
Moisture absorption (24 hour immersion - % weight gain)	0.08%	ASTM D-570
Thermal Conductivity	0.95 W/mK	ASTM D-2214
Thermal Rating	-55°C to 180°C	EIC 216
Fungus Resistance	Non-Nutrient	Mil-I-46058C
Volume Resistivity (ohm-cm)		Mil-I-46058C
at 25°C	3.0 x 10 <sup>15</sup>	
Dielectric Strength (V/mil)	450 at 3mm	ASTM D-149
Dielectric Constant at 25°C		ASTM D-150
@ 1 KHz / 1 MHz	4.5 / 4.0	
Dissipation Factor at 25°C		ASTM D-150
at 1 KHz / 1 MHz	0.009 / 0.003	

**NOTE** : Values are based on laboratory or average production results – not for specification purposes.

### **PROCESSING AND APPLICATION INSTRUCTIONS :**

Apply to clean, dry components. It is helpful for best impregnation to first heat the components to 60°C – 100°C to add in removing any volatile components and to improve wetting and penetration of the resin. Vacuum de-gassing the components once they are how may also be helpful to remove any volatiles or other contaminants improve final results. To do this, hold the components under full vacuum for at least 10 minutes.

Prepare a container of EpoPro 232FR by mixing gentle to ensure the resin is uniform. If desired, heat the resin to up to about 60°C to reduce the viscosity for easier application and better penetration into narrow gaps and tightly wound wires. After vacuum degassing, apply the resin. This may be done by pouring the resin into the component(s), brushing the resin on to the device or immersing the components in the hot EpoPro 232FR and pulling a vacuum to draw the resin throughout the components. If using vacuum, hold for at least 5-10 minutes then break the vacuum and remove the components from the resin and place into an oven to cure. If desired and suitable for the parts, a pressure tank may also be used to aid the resin system in penetrating the components prior to curing the system.

## **PACKAGING AVIALABLE:**

This product is available in a wide range of package sizes including quarts, gallons, , 5-gallons pails, and 55-gallon drums. It can also be supplied in squeeze bottles or syringes as well.

## **STORAGE GUIDELINES:**

Store the EpoPro 232FR in a clean, cool, and dry environment in its tightly closed original containers. If crystallization occurs, heat the entire container of 232 for 2 - 4 hours at 60°C to re-liquefy the material. Also protect from exposure to extended moisture or high humidity. Tightly re-seal containers after use. If the recommended storage conditions are observed the products will have a minimum shelf-life of 6 months at 25° from the date of shipment. The shelf-life may be extended to 9 months by refrigerating the product upon receipt and may be extended further to 12 months or longer if the product is frozen.

## **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 232FR**

**WARNING!** May cause eye & skin irritation. Prolonged or repeated skin contact or inhalation of vapors may cause allergic skin or respiratory reactions. Harmful if inhaled or swallowed. 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.

## **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 supercedes 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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