

EpoPro[®] 231

1 COMPONENT, LOW VISCOSITY EPOXY IMPREGNATING RESIN

EpoPro[®] 230 is 1-part epoxy system that is excellent for VPI, trickle impregnation, and dip and back systems. It features a very low viscosity, very good room temperature stability and an excellent impact and shock resistance. EpoPro 231 is a heat curing resin and is designed to be vacuum stable, so that impregnation can occur under high vacuum without volatilization of the epoxy resin. The system is solvent free and free of volatile organic compounds (VOCs). The EpoPro 231 demonstrates excellent adhesion to most materials and provides very good chemical and heat resistance.

The EpoPro 231 resin is available in a standard clear to light yellow color or in custom colors such as black, red, or white. Many other custom variations are available including toughened or more flexible versions, accelerated versions offering shorter cure times, and many other modification designed to suit your application or production process. Please contact us to discuss your application if you'd like to receive samples of a custom variant that would be suitable for your application.

SUGGESTED APPLICATIONS:

- Solvent and VOC free
- Low viscosity for excellent penetration into tightly wound coils
- Vacuum stable

| HANDLING PROPERTIES | <u>VALUE</u> | <u>TEST METHOD</u> |
|----------------------------|------------------------|---------------------------|
| <u>EpoPro 231</u> | | |
| Visual Appearance | Clear, light yellow | |
| Density | 1.12 g/cm ³ | ASTM E-201 |
| Viscosity, Part A, @ 25°C | 420 cps | ASTM D-2393 |
| Flash Point | >100°C | ASTM D-92 |

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|--|--|
| Mix Ratio (part by weight) | 1 component / No –mix system |
| Shelf-life | at least 6 months @ 25°C or at least 9 months at 5°C |
| Pot life (100 grams) @ 120°C | >20 minutes |
| Cure Schedules: | 2 – 4 hours @ 125°C or 6 hours at 110°C* |
| *Note: many other cure schedules are possible. Please contact us for assistance if you'd like to use an alternate cure schedule. | |

PHYSICAL PROPERTIES (Tested at 25C unless otherwise noted – cured 2 hours @ 150C)

| | | <u>TEST METHOD</u> |
|---|-----------------------|--------------------|
| Appearance | Clear to light yellow | Visual |
| Hardness, Shore D At 25°C | 40D | ASTM D-2240 |
| Tensile Strength | 5,000 psi | ASTM D-638 |
| Tensile Elongation | 12.0% | ASTM D-638 |
| Tensile Modulus | 320,000 psi | ASTM D-638 |
| Curing Shrinkage (linear) | 0.008% | |
| Glass Transition Temperature (Tg) | 110°C | ASTM D-648 |
| Coefficient of Thermal Expansion (CTE): | | ASTM E-831 |
| below Tg / above Tg (ppm/°C) | 72 / 145 | |
| Moisture absorption (24 hour immersion - % weight gain) | 0.1% | ASTM D-570 |
| Thermal Conductivity | 0.18 W/mK | ASTM D-2214 |
| Thermal Rating | -55°C to 105°C | EIC 216 |
| Fungus Resistance | Non-Nutrient | Mil-I-46058C |
| Volume Resistivity (ohm-cm) | | Mil-I-46058C |
| @ 25°C | 3.0×10^{15} | |
| Dielectric Strength (V/mil) | 400 | ASTM D-149 |
| Dielectric Constant @ 25C | | ASTM D-150 |
| @ 1 KHz / 1 MHz | 3.2 / 3.05 | |
| Dissipation Factor @ 25C | | ASTM D-150 |
| @ 1 KHz / 1 MHz | 0.004 / 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 using a Vacuum Pressure Impregnation system or dip and bake process as follows: First heat the components to 60C – 100C to add in removing any volatile components. The place the components to be impregnated under vacuum to remove any volatiles or other contaminants. Hold at full vacuum for at least 10 minutes. Prepare a container of EpoPro 231 by heating to 60C. After vacuum degassing, immerse the components in the hot EpoPro 231 and pull a vacuum to draw the resin throughout the components. Hold for 5-10 minutes then break the vacuum and remove the components from the resin and place into an oven to cure.

PACKAGING AVIALABLE:

This product is available in a wide range of package sizes including quarts, gallons, 2.5 gallons, 5-gallons pails, and 55-gallon drums. It can also be supplied in squeeze bottles or syringes.

STORAGE GUIDELINES:

Product Datasheet



Store the EpoPro 231 in a clean, cool and dry environment in its tightly closed original containers. If crystallization occurs, heat the entire container of 231 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 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 231

CAUTION! 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

Specialty Polymers & Services, Inc. (SP&S)

27822 Fremont Court

Valencia, CA 91355

www.spolymers.com

Tel: 661-294-1790

Fax : 661-294-0640

info@spolymers.com