Product Datasheet

SP&S Specialty Polymers and Services

EpoPro® 275A/B

TOUGH, IMPACT & SHOCK RESISTANT ENCAPSULANT & IMPREGNATING SYSTEM

EpoPro® 275A/B is a 100% solids, solvent-free, epoxy potting and impregnating system with a low mixed viscosity. It cures to form a tough, chemical resistant polymer with very good mechanical and electrical properties and outstanding thermal shock & impact resistance. It is recommended for many different applications but is most often used in applications that will be exposed to significant vibration, thermal shock or cyrogenic environments. The cured EpoPro 275A/B has been shown to withstand deep thermal cycling and even been dipped in liquid nitrogen without sustaining damage.

The EpoPro 275A/B system is available in a standard clear, light amber color and can also be supplied in other colors such as black, red, or white. Other variants including lower viscosity, faster setting/curing version, and mineral filled versions are also available by request. 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 • Low viscosity - good flow & penetration	• Low shrinkage during curing • Highly resistant to vibration, thermal shock, and cryogenic temperatures.

HANDLING PROPERTIES	VALUE	TEST METHOD
EpoPro 275A (resin)		
Visual Appearance	clear, light yellow to amber	Visual
Density	1.15 g/cm³	ASTM E-201
Viscosity at 25ºC	10,000 – 14,000- cps	ASTM D-2393
Flash Point	>100°C	ASTM D-92
EpoPro 275B (hardener)		
Visual Appearance	clear, light yellow to amber	Visual
Density	0.98 g/cm³	ASTM E-201
Viscosity at 25ºC	55 cps	ASTM D-2393
Flash Point	>100°C	ASTM D-92
Mix Ratio	100A:72B part by weight	
Viscosity Mixed at 25ºC / 40ºC / 50ºC	950 cps / 200 cps / 120 cps	ASTM D-2393
Viscosity rate of increase (10 g)	at 40ºC / at 50ºC	
Initial	200cps / 120cps	
1 hour	270 cps / 310 cps	
2 hours	458 cps / 1500 cps	
3 hours	850 cps / > 10,000 cps	
4 hours	2500 cps / Gelled	
5 hours	6000 cps	

Gel Time (10 g. mass)

25ºC: 18 – 24 hours	40ºC: 6 – 8 hours	60ºC: 180 – 210 minutes
80ºC: 60 – 75 minutes	100ºC: 20 – 30 minutes	

Curing Options: This system can be cured at room temperature or with heat. Minimum cure time at room temperature (around 25ºC) is 24 – 48 hours and final properties may take up to 7 days at room temperature to fully develop. Heat curing options include 16 hours at 40ºC, 6 hours at 60ºC, 3 hours at 80ºC and 1 hour at 100ºC. To minimize shrinkage and stress on embedded components allow the EpoPro 275A/B to gel fully at room temperature (100% - 200% of the gel times listed above), then heat cure using any of the mentioned heat cures. Allowing for a room temperature gel prior to heat curing may reduce curing shrinkage by 50% or more.

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

		TEST METHOD
Appearance	Clear, light amber liquid	Visual
Hardness, Shore D at 25°C	75 - 80	ASTM D-2240
Tensile Strength	5,000 psi	ASTM D-638
Flexural Strength	4,600 psi	ASTM D-638
Glass Transition Temperature (Tg)	45 - 50ºC	ASTM D-648
Coefficient of Thermal Expansion (CTE):		ASTM E-831
Average from -30ºC to +30ºC (ppm/ºC)	95 - 100	
Thermal Conductivity	0.18 W/mK	ASTM D-2214
Thermal Shock test, cycles to failure	>25 cycles	See test note**
Volume Resistivity (ohm-cm) at		Mil-I-46058C
25ºC / 40ºC / 50ºC / 60ºC	1.4×10^{16} / 3.0×10^{15} / 1.7×10^{13} / 5.0×10^{11}	
Dielectric Strength (V/mil)	580 at 3mm	ASTM D-149
Dielectric Constant at 50Hz and		ASTM D-150
4.2K (-269ºC) / 77K (-196ºC)	2.73 / 2.76	
200K (-73ºC) / 273K (0ºC) / 298K (25ºC)	3.10 / 3.49 / 3.60	
Dissipation Factor at 50Hz and		ASTM D-150
4.2K (-269ºC) / 77K (-196ºC)	0.00045 / 0.00184	
200K (-73ºC) / 273K (0ºC) / 298K (25ºC)	0.00747 / 0.00893 / 0.0113	

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

** Thermal shock test – test samples consisted of 3 inch diameter x 1 inch high blocks, each containing a 10mm c 50mm hex headed brass bolt located axially within the block with the threaded end protruding and with a 3mm cap between the encapsulated bolt head and the specimen surface. Sample were submerged directly into liquid nitrogen, removed after 2 minutes, and allowed to warm to room temperature. After thawing the samples were examined for any signs of cracking. Non-cracked specimens were cycled again through the same test. Average cycle time to failure for a batch of 25 specimens is reported.

PROCESSING AND APPLICATION INSTRUCTIONS :

This system should be thoroughly mixed at the indicated ratio for at least 2 minutes prior to use. It may be applied in several different ways. For potting and casting applications it can be poured or dispensed into clean, dry devices under ambient conditions or it may be vacuum de-gassing and/or warmed to reduce its viscosity and help to eliminate any voids or air bubbles.

It may be applied as a coating by brush or automated equipment including by spraying. For spraying applications, the use our Ultralane Thinner #1 or #25 may be helpful to reduce viscosity and control application thickness.

It may also be used to impregnate devices such as rotors and stators and in this case the resin is usually heated to 40ºC or 50ºC after mixing and the components immersed in the resin. Vacuum and/or pressure is then used to ensure full impregnation and the component is then removed and placed into an oven to be heat cured.

Many other application methods including injection from a syringes or cartridges are possible with this versatile material.

PACKAGING AVIALABLE:

This product is available in gallon kits. Other package size including pre-mixed and frozen syringes or cartridges are available by request. Please contact us if you have specific packaging requirements.

STORAGE GUIDELINES:

Store the EpoPro 275A/B in a clean, cool, and dry environment in its tightly closed original containers. If crystallization occurs, heat the entire container of the effected component for 4 hours at 50ºC - 60ºC to re-liquefy the material. Also protect from exposure to extended moisture or high humidity and tightly re-seal containers after use. If the recommended storage conditions are observed the products will have a minimum shelf-life of 12 months at 25ºC from the date of shipment for 2 part kits. Pre-mixed and frozen syringes will have a minimum shelf-life of 6 months from date of shipment at -40ºC or colder.

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:

See SDSs for latest safety information and handling precautions.

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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