# Product Datasheet

SP&S Specialty Polymers and Services

# EpoPro® 273A/B

RoHS 76/769/EEC

## FLEXIBLE EPOXY ENCAPSULATION SYSTEM

EpoPro® 273A/B is 2-part epoxy system that cures with heat to form a tough, flexible polymer. It is ideal for potting pressure sensitive components and provides excellent protection from thermal shock, impact, and environmental conditions. It has been used in many automotive under-the-hood applications where it provides excellent heat resistance even in moist conditions. In addition, the EpoPro® 273A/B demonstrates excellent adhesion to most materials, is solvent free, and has low or no volatile organic content.

The EpoPro 273A/B resin is available in a standard black color, but many other custom colors and other variations are available including accelerated versions offering shorter cure times, and many other modifications 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:**

- Potting and encapsulation of Stress-sensitive components
- Automotive sensors and modules
- Encapsulation of Thermal shock or Impact sensitive components

| HANDLING PROPERTIES | VALUE | TEST METHOD |
|---|---|---|
| EpoPro 273A | | |
| Visual Appearance | Black filled Liquid | |
| Density | 1.40 g/cm³ | ASTM E-201 |
| Viscosity, Part A, @ 25ºC | 20,000 cps | ASTM D-2393 |
| Flash Point | >121°C | ASTM D-92 |
| EpoPro 273B | | |
| Visual Appearance | Clear liquid | |
| Density | 1.00 g/cm³ | ASTM E-201 |
| Viscosity, Part A, @ 25ºC | 150 cps | ASTM D-2393 |
| Flash Point | >121°C | ASTM D-92 |
| Mix Ratio (part by weight) | 100A:60B | |
| Mix Ratio (part by volume) | 100A:85B | |
| Mixed Viscosity @ 25ºC, initial | 2,000 cps | |
| Pot life (100 grams) @ 25ºC | >8 hours | |
| Pot life (100 grams) @ 100ºC | 10 – 24 minutes | |
| Cure Schedules: | 1 hour @ 100ºC **or** 2-3 hours at 80C* | |

*Note: many other cure schedules are possible. Please contact us for assistance if you'd like to consider an alternate cure schedule.

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| **PHYSICAL PROPERTIES** (Tested at 25C unless otherwise noted – cured 2 hours @ 150C) | | TEST METHOD |
|---|---|---|
| Appearance | Black Solid | Visual |
| Hardness, Shore A At 25°C | | |
| Initial result | 50A | |
| After 1 week aging @ 100°C | 50A | |
| After 1 week aging @ 125°C | 55A | |
| After 1 week aging @ 150°C | 60A | |
| Tensile Strength at Break | | ASTM D-638 |
| Initial result | 450 psi | |
| After 1 week aging @ 100°C | 630 psi | |
| Tensile Elongation at break | | ASTM D-638 |
| Initial result | 100% | |
| After 1 week aging @ 100°C | 110% | |
| Tear Strength | | |
| Initial result | 31 pli | |
| After 1 week aging @ 100°C | 43 pli | |
| After 1 week aging @ 125°C | 47 pli | |
| Glass Transition Temperature (Tg) | -17ºC | ASTM D-648 |
| Coefficient of Thermal Expansion (CTE): | | ASTM E-831 |
| below Tg / above Tg (ppm/ºC) | 57 / 200 | |
| Moisture absorption, % weight gain) | | ASTM D-570 |
| 24 hours @ 25°C | 0.85% | |
| 4 hours in boiling water | 1.70% | |
| Thermal Conductivity | 0.28 W/mK | ASTM D-2214 |
| Thermal Rating | -55ºC to 150ºC | EIC 216 |
| Surface resistivity (ohms) | $3.4 \times 10^{15}$ | ASTM D-257 |
| Volume Resistivity (ohm-cm) | | Mil-I-46058C |
| @ 25ºC | $1.0 \times 10^{15}$ | |
| Dielectric Strength (V/mil) | 640 | ASTM D-149 |
| Dielectric Constant @ 25C @ 60 KHz | 8.8 | ASTM D-150 |
| Dissipation Factor @ 25C @ 60 KHz | 0.074 | ASTM D-150 |
| Capacitance @ 25C @ 60 KHz | 0.46 microfarads | ASTM D-150 |

**Pressure Cooker Test** (samples exposed to boiling water at 121ºC and 2 atmospheres of pressure for the indicated time periods then tested for the properties shown below.)

| | **2 hour Exposure** | **24 hour Exposure** | |
|---|---|---|---|
| Glass Transition Temperature (Tg) | -15ºC | -13ºC | ASTM D-648 |
| Moisture absorption, % weight gain) | 0.32% | 3.2% | ASTM D-570 |

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

**PROCESSING AND APPLICATION INSTRUCTIONS :**

Mix using Meter-mix dispensing, or manually, as follows: Weigh the desired amount of Part A into mixing container whose weight has been tared. If material has been heated, allow to cool to 25 ± 5°C before continuing. (The pot life of mixed material will be shortened considerably if hot material is used.) Then weigh the desired amount of Part B into mixing container with resin. Mix thoroughly by means of mechanical mixer or manual stirring. We suggest mixing for at least 1-2 minutes, with frequent scrapping of the sides and bottom of the mixing container to ensure a complete Check for uniform color as a sign of complete mixing.

Vacuum deairing is recommended to remove any entrapped air from the mixing procedure. To deair most products, 1-2 minutes under full vacuum is recommended for each quart of volume of mixed material. Quickly dispense potting material into cavity or channel to be sealed. For best adhesion ensure that the surface to be bonded is clean and dry.

**PACKAGING AVAILABLE:**

This product is available in a wide range of package sizes including quarts & 5-gallon pails. It can be supplied pre-mixed and frozen in syringes or in custom kit sizes on request. Please contact us to discuss your preferred packaging if a custom packaging solution would be of interest.

**STORAGE GUIDELINES:**

Store the EpoPro 273A&B in a clean, cool and dry environment in its tightly closed original containers. Protect from extended exposure to temperatures below 15ºC (59ºF) to prevent crystallization. If crystallization occurs, heat the entire container for 2- 4 hours at 70ºC 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 12 months from the date of shipment.

**HANDLING PRECAUTIONS:**

Follow all mandatory and recommended industrial hygiene procedures whenever these products are being handled and processed. For additional information please consult the corresponding material safety data sheets.

**EpoPro 273A**

**DANGER!** Corrosive, causes skin and eye burns. May cause allergic skin reaction. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated contact with skin. Avoid breathing vapor or mist. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

**EpoPro 273B**

**DANGER!** Corrosive, causes skin and eye burns. Harmful if swallowed, or if absorbed through skin. Do not get in eyes, on skin, on clothing. Avoid breathing vapor or mist. Keep container closed. Use with adequate ventilation wash thoroughly after handling.

**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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