



DYNAMIS EPOXY, LLC

EPO Shield 400

Technical Data Sheet

Electronic Circuit Board Concealment & Protective Encapsulation Epoxy

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Product Family	Electronic Potting / Encapsulation	Approved By	John Caramanian II
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1. Product Description

EPO Shield 400 is a two-component, opaque, semi-rigid, room-temperature-curing epoxy potting compound intended primarily to conceal proprietary electronic circuit board designs. Its pourable, low-viscosity formulation surrounds components and creates an opaque encapsulation that obscures circuitry, board layouts, and component arrangements from direct visual inspection.

In addition to design concealment, encapsulation helps protect electronic assemblies against moisture, contaminants, and vibration. Its low viscosity also helps the resin flow around intricate components and into confined spaces. Protection performance is application-dependent and should be qualified on the finished assembly.

2. Typical Uses

- Concealment of proprietary circuit designs, component layouts, and electronic assemblies.
- Protective potting of circuit boards and other intricate electronic components.
- Applications requiring a pourable, room-temperature-cure, semi-rigid epoxy encapsulant.
- Encapsulation where an opaque cured finish is preferred to a transparent potting resin.

3. Product Summary

Property	Typical Value / Guidance
Mix Ratio	1 part Part A to 1 part Part B by volume.
Appearance / Colors	Opaque; black or dark red.
Mixed Viscosity	700-800 cps, Brookfield at 80°F.
Working Time / Pot Life	Approximately 1 hour for a 1-quart mass at 80°F.
Cure Time	500 g mass: 1-2 hours at 80°F; 100 g mass: 2-3 hours at 80°F.
Mixing Time	3-5 minutes; low-speed mechanical mixing with a timer.
Maximum Single Mix / Pour	Do not mix and pour more than 1/2 gallon at one time.
Release to Service	Determine on representative assemblies; cure time varies with mass and temperature.
Storage / Shelf Life	Approximately 1 year for unopened, separate components at room temperature.

4. Kit Packaging and Shipping Classification

Listed package sizes are shown below. Confirm current availability, shipping weights, box dimensions, and classification against packaging records and SDS documentation.

Package / Configuration	Shipping Weight	Box / Package Size	Contents / Packing Configuration
1-Quart Unit (6 units / case)	To confirm	To confirm	Six 1-quart units per case.
1-Gallon Unit	To confirm	To confirm	Current configuration to confirm.
2-Gallon Unit	To confirm	To confirm	Current configuration to confirm.
10-Gallon Unit	To confirm	To confirm	Current configuration to confirm.

Shipping classification: Use current Part A, Part B, and kit SDS and shipping documentation. Do not assign a classification from this sheet.

5. Available Colors

Black and dark red. Confirm color availability before accepting orders.

6. Assembly and Environmental Requirements

Requirement	Guidance
Board / Component Condition	Electronic assemblies should be clean, dry, and free of contaminants before encapsulation.
Assembly Compatibility	Test the resin system on representative boards, components, connectors, and housings before production use.
Electrical Condition	Disconnect power before applying material to a circuit board or assembly.
Material Conditioning	Use materials at a controlled room temperature; Dynamis standard handling guidance is 70°F-85°F.
Encapsulation Geometry	Account for cavity size, sensitive components, thermal dissipation, and the heat produced during cure.

7. Mixing Instructions

IMPORTANT: 1:1 by volume. Use low-speed mechanical mixing and a timer. Do not shake. Do not add water. Do not exceed a 1/2-gallon batch for any single mix and pour.

Step	Instruction
1	Verify the correct EPO Shield 400 Part A and Part B containers, lot identification, and application requirements.
2	Condition and inspect the components. Follow the current product-specific SOP for any required individual pre-mixing.
3	Combine Part A and Part B at a 1:1 ratio by volume in a clean, dry mixing container. Kits should remain matched.
4	Mechanically mix at low speed for 3-5 minutes, using a timer. Scrape the sides and bottom of the container as necessary and continue mixing until uniform. Do not shake.
5	Pour promptly, while within the working time. Do not use material that has thickened, gelled, or become excessively hot.

8. Encapsulation / Application Guidance

- Position the board in a clean, dry fixture or enclosure and verify that it is electrically disconnected.
- Pour steadily to promote flow around components and minimize trapped air or unfilled cavities.

- Select the fill depth and cavity geometry to conceal the intended design features without exceeding the recommended batch limit.
- Check heat-sensitive assemblies for compatibility with the cure exotherm before production use.
- Allow the encapsulant to cure before handling, installing, or energizing the assembly; qualify the release-to-service interval for the application.

9. Cure Time and Exotherm

Test Condition	Typical Value
500 g mixed mass without a heat sink	Maximum exothermic temperature: 170°F.
100 g mixed mass without a heat sink	Maximum exothermic temperature: 94°F.
500 g mixed mass at 80°F	Cure time: 1-2 hours.
100 g mixed mass at 80°F	Cure time: 2-3 hours.

Cure time and exotherm depend on batch mass, shape, ambient temperature, heat dissipation, and assembly construction. Qualify the time to handling or electrical service for the finished assembly.

10. Physical and Electrical Properties

Property	Typical Value / Qualification
Specific Gravity	1.15.
Shore A Hardness at 80°F	99 ± 5; verify the hardness specification if critical to the application.
Shore D Hardness at 80°F	78 ± 5.
Dielectric Strength	450 volts per mil; verify the electrical requirements for the finished assembly.
Heat Resistance	Up to 311°F (155°C); qualify for the intended service temperature.
Flammability	Self-extinguishing (descriptive); no UL 94 rating is claimed.

11. Chemical Resistance

The following are qualitative chemical-exposure observations. Confirm compatibility for the intended exposure conditions and service requirements.

Chemical / Exposure	Typical Observation
50% Caustic Soda	No effect
10% Hydrochloric Acid (HCl)	No effect
10% Sulfuric Acid (H ₂ SO ₄)	No effect
10% Nitric Acid (HNO ₃)	No effect
Glacial Acetic Acid	Attacks surface
Salt Spray - 1,000-hour exposure	No effect
Fuel Oil	No effect
Lubricating Grease	No effect
Water (H ₂ O)	No effect
10-weight non-detergent transformer oil	No effect

Chemical / Exposure	Typical Observation
30-weight non-detergent oil	No effect
Kerosene	No effect

12. Storage and Shelf Life

EPO Shield 400 has an approximate shelf life of one year from the date of manufacture when separate components are stored in tightly closed containers at room temperature. Dynamis standard handling guidance is to store material at 70°F-85°F and protect it from temperature extremes. Consult the current product label and SDS.

13. Cleanup, Safety, and Handling

Clean equipment before the epoxy cures using the cleaning method approved for the product and permitted by the current SDS. Once cured, material generally requires mechanical removal. Follow the current Part A and Part B SDS for personal protective equipment, ventilation, spills, handling, waste disposal, and transport.

14. Common Problems and Likely Causes

Observed Issue	Potential Cause / Check
Soft or incompletely cured material	Incorrect 1:1 ratio, incomplete mixing, off-temperature material, or inadequate cure time.
Trapped air / unfilled spaces	Air introduced by mixing, rapid pour, or complex component geometry.
Excessive heating	Large batch mass, thick section, inadequate heat dissipation, or elevated initial temperature.
Incomplete design concealment	Insufficient fill, uncovered circuit features, or voids in the cured mass.

15. Applicable Standards and Product Limitations

No specific UL 94 fire rating, IPC electronic encapsulation certification, moisture-ingress rating, vibration test method, or tamper-resistance certification is claimed. Descriptive performance characteristics do not constitute third-party certification.

EPO Shield 400 is intended to discourage visual inspection of proprietary designs; it is not represented as tamper-proof or as a guarantee against reverse engineering. Buyers and applicators must test the material with representative electronic assemblies to establish suitability, including electrical and thermal performance.

16. Technical Support and Limitation

This Technical Data Sheet describes EPO Shield 400, including its primary application in electronic circuit-board design concealment and its protective encapsulation characteristics. Technical values are typical guidance and not a product-specific warranty. The user is responsible for confirming suitability for the intended design, substrate, operating temperature, and service conditions.

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