ATMOSPHERIC PRODUCTS AND SERVICES (APS)

Integrity ◘ Innovation ◘ Excellence ◘ Dedication

SafetyAlert-45

Epoxy Systems Spray Lay-Up Operations

General

All personnel involved in the handling and use of these materials must be thoroughly familiar with the hazards associated with the products as described in the Material Safety Data Sheet (MSDS). In addition, the application of epoxy systems requires that applicators be familiar with each of the steps required in the application and the necessary safety precautions for each step.

Safe Handling Practices

STEP 1. MOLD PREPARATION

Molds that are new or have been in storage are cleaned with a stripping or cleaning agent. A release agent, either liquid or paste, is then rubbed onto the mold surface. This may require the use of an electric or air powered buffer.

Safety and Health Concerns

- Flammability of solvents (e.g., MEK)
- Skin contact with solvents
- Inhalation of solvents

Protective Measures

- Use adequate ventilation
- Wear disposable coverall or apron
- Wear protective eyewear
- Prepare molds away from open flames or high heat
- Use respirators
- Wear chemical-resistant gloves
- Do not wear loose clothing
- Change personal protective equipment as needed

STEP 2. EQUIPMENT AND MATERIALS PREPARATION

Spray equipment for the epoxy resin system may need to be prepared prior to use. Solvents may be used to purge lines and clean spray heads. The equipment must be assembled and tested.

Safety and Health Concerns

- High-pressure lines
- Skin contact with solvents and residual resin system
- Injection of epoxy resin system through the skin from high-pressure equipment
- Inhalation of solvents
- Flammability of solvents

Protective Measures

- Wear protective eyewear
- Use respirators
- Wear chemical-resistant gloves
- Use adequate ventilation
- Wear disposable coverall
- Avoid open flames or high heat

Responsible Care
Good Chemistry at Work

STEP 3. BLENDING EPOXY RESINS

Each component is normally stored in a separate container/ tank and combined during spraying through an in-line mixer at the head of the spray gun. Solvent or reactive diluents may be added to thin the resin. The resin and curing agent are mixed properly if the mixture is uniform in color (no streaking).

Safety and Health Concerns

- Skin exposure by direct contact with the resin system
- Skin and inhalation exposures, if thinning epoxy resins with reactive diluents or solvents
- Flammability of solvents

Protective Measures

- Use adequate ventilation
- Wear disposable coverall
- Wear protective eyewear
- Wear chemical-resistant gloves

STEP 4. RESIN APPLICATION AND REINFORCEMENT

Resin is applied to the surface using a spray gun (compressed air, high-pressure airless, air-assisted airless, or flow coater). A layer of fiberglass or carbon reinforcement is then laid over the resin. Wet-out/compaction of the reinforcement is done using a special laminating roller with grooves in it. The procedure is repeated until the desired thickness is achieved. A ventilated paint booth can be used for small parts.

Safety and Health Concerns

- Irritation to eyes and skin caused by carbon fibers
- Injection of epoxy resin through the skin from high-pressure equipment
- Skin and inhalation exposure to overspray mists

Protective Measures

- Spray equipment and mold should be properly grounded
- Use respirators
- Wear chemical-resistant gloves
- Wear protective eyewear
- Use adequate ventilation
- Wear disposable coverall
- Wear chemical-resistant boots
- Replace contaminated personal protective equipment at breaks
- Remove personal protective equipment outside of work area and avoid skin contact with resin system

STEP 5. CURING

When lay-up is complete, the part will need to be cured. Depending on the resin formulation, a ventilated curing oven may be used or the part may cure at room temperature for a number of hours or days.

Safety and Health Concerns

- Inhalation of resin system vapors
- Flammability of solvent vapors from uncured resin systems
- Skin contact with uncured resin

Protective Measures

- Use adequate ventilation
- Wear chemical-resistant gloves
- Use respirators

STEP 6. DEMOLDING / FINISHING

After the part is partially cured, it is removed from the mold. Finishing operations such as cutting or sanding, using electric or air powered tools, may be required.

Safety and Health Concerns

- Cuts and scrapes from flash around edges of part
- Inhalation and skin contact with uncured resin system dust

Protective Measures

- Wear heavy cotton or leather gloves
- Wear protective eyewear
- Use adequate ventilation to minimize dust from finishing operations
- Use respirators
- Wear protective clothing

STEP 7. CLEANUP

When the job is complete, tools and equipment must be cleaned. This includes purging feed lines with solvent and partially disassembling spray equipment.

Safety and Health Concerns

- Grounding of equipment and flammability of solvents
- Skin contact with solvents and residual epoxy system
- Inhalation of solvents during cleaning of equipment
- Injection of solvents and coating into skin from high-pressure spray equipment
- Eating/drinking/smoking before cleaning skin

Protective Measures

- Ground all equipment while cleaning with solvents
- Use adequate ventilation while cleaning equipment
- Use respirators while cleaning equipment
- Wear disposable coverall while cleaning equipment
- Wear chemical-resistant gloves while cleaning equipment
- Wear protective eyewear while cleaning equipment
- Remove personal protective equipment before entering lunch or other break rooms
- Avoid skin contact with contaminated personal protective equipment when removing
- Clean or dispose of contaminated clothing
- Use industrial skin cleaners to remove any resin system; NEVER use solvents
- Shower at the end of the shift

Information Sources

- Compressed Gas Association
  1725 Jefferson Davis Highway, Suite 1004
  Arlington, VA 22202-4102
  Phone: 1-703-412-0900
- National Fire Protection Association
  1 Batterymarch Park, P.O. Box 9101
  Quincy, MA 02269-9101
  Phone: 1-800-344-3555

Emergency Response Telephone Numbers

USA

CHEMTRAC
1-800-424-9300 (Toll Free in the U.S., Canada, and U.S. Virgin Islands)
703-527-3887 for calls originating elsewhere (Collect calls are accepted)

CHEM-TEL, INC.
1-800-255-3924 (Toll Free in the U.S., Canada, and U.S. Virgin Islands)
813-248-0585 for calls originating elsewhere (Collect calls are accepted)

INFOTRAC
1-800-535-5053 (Toll Free in the U.S., Canada, and U.S. Virgin Islands)
352-323-3500 for calls originating elsewhere (Collect calls are accepted)

3E COMPANY
1-800-451-8346 (Toll Free in the U.S., Canada, and U.S. Virgin Islands)
760-602-8703 for calls originating elsewhere (Collect calls are accepted)

NATIONAL RESPONSE CENTER (NRC)
Call NRC (24 Hours)
1-800-424-8802 (Toll Free in the U.S., Canada, and U.S. Virgin Islands)
202-267-2675 in the District of Columbia

MILITARY SHIPMENTS
703-697-0218 Explosives/Ammunition Incidents (Collect calls accepted)
1-800-851-8061 All other dangerous goods incidents

NATIONWIDE POISON CONTROL CENTER (United States Only)
1-800-222-1222 (Toll Free in the U.S.)

CANADA

CANUTEC
613-996-6666 (Collect calls are accepted)
*666 Cellular (In Canada only)

Visit Web Site: www.apsusa.biz for further information
or
Call 410-833-7170
or
Ask your local sales representative