**Epoxy Systems**

**Spray Lay-Up Operations**

**Safe Handling Practices**

**MOLD PREPARATION**

Molds that are new or have been in storage are cleaned with a stripping and 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
- Use adequate ventilation
- Wear a disposable coveralls or apron
- Wear protective eyewear
- Prepare molds away from open flames or high heat
- Do not wear loose clothing
- Change PPE as needed

**PROTECTIVE MEASURES:**

- Use respirators
- Wear chemical-resistant gloves
- Do not wear loose clothing
- Change PPE as needed

**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 system
- Injection of epoxy resin system through the skin from high-pressure equipment
- Inhalation of solvents

**PROTECTIVE MEASURES:**

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

**BLENDING EPOXY RESINS**

Each component is normally stored in a separate container and combined during spraying through an inline mixer at the head of the spray gun. Solvent or reactive diluents may be added to thin the resin. The resin and curing agent is mixed properly if it 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 and solvents
- Flammability of solvents

**PROTECTIVE MEASURES:**

- Use respirators
- Wear chemical-resistant gloves

**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/compression of the reinforcement is done using a special laminating roller with grooves in it. This procedure is repeated until the desired part thickness is achieved. A ventilated paint booth can be used for small parts.

**SAFETY AND HEALTH CONCERNS:**

- Carbon fibers may cause irritation to eyes and skin
- Injection of epoxy resin through the skin from high-pressure equipment
- Skin and inhalation exposure to overspray mists
- Flammability of solvents

**PROTECTIVE MEASURES:**

- Use respirators
- Wear disposable coveralls
- Wear chemical-resistant gloves
- Use adequate ventilation
- Wear chemical-resistant boots
- Replace contaminated PPE at breaks

**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 will 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 respirators
- Wear chemical-resistant gloves if contact is possible

**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 the part
- Inhalation and skin contact with uncured resin system dust

**PROTECTIVE MEASURES:**

- Use respirators
- Wear protective clothing
- Use adequate ventilation to minimize dust from finishing operations

**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 equipment from high-pressure spray equipment
- Injection of solvent and coating into the skin
- Eating/drinking/smoking before cleaning skin

**PROTECTIVE MEASURES:**

- Ground all equipment while cleaning with solvents
- Use adequate ventilation when cleaning equipment
- Wear disposable coveralls when cleaning equipment
- Wear chemical-resistant gloves when cleaning equipment
- Wear protective eyewear when cleaning equipment
- Remove PPE before entering lunch or other break rooms
- Avoid skin contact when removing PPE
- Clean or dispose of contaminated clothing
- Use industrial skin cleaners to remove any resin system
- Shower at end of shift

Remember: Always read the MSDS before using a chemical.