

The uncured resin is usually the condensation product of "Bis Phenol-A" and epichlorohydrin which, at room temperature, can be either in the liquid or solid state. Fillers such as fiberglass, silica flour, asbestos, and diatomaceous earth may be added to the uncured resin. Diluents such as organic solvents may also be added.

Curing agents commonly used include aromatic or aliphatic amines, acid anhydrides, organic acids, polyamides, and organic peroxides. The chemical process of curing can be done at room temperature (cold cure) or at elevated temperatures. The curing time will vary from a few minutes to several hours, depending upon chemicals and temperatures used.

Health Hazards. The principal hazard associated with epoxy resin systems is a skin reaction or dermatitis. Epoxy resin dermatitis is largely due to curing agents and solvents. The condition is simply irritation or allergic reaction of skin rather than a general systemic toxicity. Amine compounds, acid anhydrides, organic acids, and organic peroxides which are used as curing agents are both primary irritants and skin sensitizers. Probably the most troublesome of the chemicals are amine catalysts.

Skin contact with these curing agents is responsible for the majority of dermatitis cases associated with epoxy resin systems. The completely cured epoxy resins are relatively inert and do not constitute a dermatitis exposure. However, dermatitis cases are common among workers machining or cutting resins thought to be cured, but which still contain free catalysts. Amine vapors, which are usually abundantly liberated during hot curing processes, cause irritation of the eyes and mucous membranes. In some individuals, they also can cause a lung reaction resembling asthma. These vapors may cause dermatitis among sensitized workers.

Exposure to dust from fillers such as silica flour, asbestos, and diatomaceous earth may present potential health hazards. Fiberglass, which is used in laminating operations, can cause irritation to the skin, eyes, and mucous membranes. Dust resulting from cutting, grinding, and shaping of completely cured resins is relatively inert. If an excess of curing agent is present in the resin, the cured product may contain unreacted curing agents which present a dermatitis exposure.

Explosion Hazards. Most uncured epoxy resins have flash points above 300°F and do not present a serious fire hazard. Some diluents, curing agents, and solvents used with epoxy resin systems are flammable. The fire and explosion hazards associated with epoxy resin systems are normally considered to be slight.

First Aid. If skin contact with unreacted epoxy resin system components occurs, affected areas should immediately be thoroughly washed with a mild soap and water. If eye contact occurs, wash for at least 15 minutes and refer to a physician.

Preplacement Medical Procedures. Workers with a history of skin diseases, allergies or abnormal pulmonary conditions should not be employed in areas where epoxy resin materials are used.

Health Hazard Control Methods.

1. Good general ventilation is necessary for areas using epoxy resin systems. Local exhaust ventilation may be needed at mixing stations and curing areas, especially if large quantities of materials are involved. Curing ovens should be exhausted to the outside.

2. Adequate wash facilities should be provided in the area where epoxy resin systems are used. An ample supply of mild soap and disposable towels should be provided.

3. If possible, areas using epoxy resin systems should be isolated from other areas of the plant.

4. Good housekeeping is essential. All spills should be cleaned immediately. The use of disposable paper overlap on work areas is desirable. Contaminated paper should be removed and stored in covered metal containers. The scrap should be removed from the plant daily.

5. All gloves or tools contaminated with epoxy resin components should be washed in a suitable solvent such as acetone or alcohol, followed by soap and water.

6. Workers should be thoroughly instructed in proper handling techniques for epoxy resin systems, be acquainted with potential hazards, and have close supervision.

Personal Protection.

1. Rubber or plastic gloves (preferably cotton lined) or disposable surgical gloves and arm protection should be worn where