

HAZARDOUS CONDITIONS AND PRECAUTIONARY MEASURES WHEN WORKING WITH EPOXY RESINS AND SOLVENTS

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Epoxy resin systems are composed of two or more reactive components: uncured resin, and a curing agent generally referred to as the "hardener."

Uncured liquid resins have a consistency of heavy syrup and in this form have limited use; however, when mixed with a hardener, a chemical reaction takes place which converts it to a hard, mechanically strong material with excellent adhesion, cohesion, chemical, and electrical resistance properties. Other additives to the mix may include liquids or solids to produce desired physical properties.

Epoxy resin applications include potting of electrical components, re-inforced plastic and metal laminates, foundry patterns, forming tools and dies, adhesives for metal and plastic bonding, appliance finishes, floor and surface coatings.

Let us look at the hazards problems.

In the December, 1959, issue of the American Medical Association's *Archives of Industrial Health*, the following statement was made: "Epoxy resins are causing more occupational dermatitis than any other new chemical material within the past 10 years!"

The first users of epoxy resins did not appreciate the delayed irritating effect resins and hardeners could have on the skin. Workers got the material on their hands and arms during mixing, pouring, and spreading operations. Since the irritant has a delayed rather than an immediate effect on most people, a few days to several weeks elapsed before severe cases of skin irritation developed.

Recent developments of new hardening agents of low toxicity and minimum irritant potential have somewhat reduced the dermatitis hazard. However, the use of these new hardeners does not eliminate the need for following prescribed precautions to avoid contact with the material. Good housekeep-

ing, personal cleanliness, and ventilation are still essential.

Basic resins, reactive curing agents, reactive diluents, and modifiers are mild to strong primary skin irritants, and some have sensitizing properties.

The volatile materials given off during compounding, handling, and curing operations can cause irritation of the eyes, upper respiratory tract, and lungs if the concentration of the vapors is excessive. No systemic intoxication of any significance has been associated with exposure to epoxy resins.

Contact dermatitis is the common type of skin irritation produced by epoxy resins. The irritation appears at the point of contact and may vary from slight reddening with mild itching to a rash or small eruptions with intense itching. In severe cases there may be open or weeping sores with or without swelling.

If an employee contracting a mild case of contact dermatitis is removed from the exposure and receives the necessary medical care, the irritation will usually clear up in a few days and the employee may return to the job without ill effects; that is, if he is careful to avoid further contact with the irritant. In severe cases the employee may become temporarily disabled and may or may not be returned to the job.

Sensitization dermatitis is the less common type of dermatitis. The term is used to describe an allergic type of reaction from a sensitizing agent. The sensitizing agent may not affect the individual on first contact, but after continued exposure for an extended period a dermatitis suddenly develops. After sensitization occurs, the slightest exposure to the sensitizing agent may precipitate a severe reaction. Irritation may spread from the point of contact to other parts of the body and be accompanied by swelling and other systemic reactions.