



# PTM&W Industries, Inc.

10640 S. Painter Avenue Santa Fe Springs, CA 90670-4092

562-946-4511 800-421-1518 FAX: 562-941-4773

Visit Us At: [www.ptm-w.com](http://www.ptm-w.com) Send Questions To: [info@ptm-w.com](mailto:info@ptm-w.com)

## RECOMMENDATIONS FOR HANDLING EPOXY PRODUCTS

### Introduction

Epoxy resins and hardeners have been commercially available for over 40 years. They have been used successfully with minimal handling difficulties in the surface coatings, structural components, and adhesives industries. This experience indicates that health problems associated with these materials can be minimized and controlled with proper handling procedures. This bulletin presents the epoxy industry's current recommendations for proper handling and use of epoxy resins, curing agents and related resins and materials.

This information is provided to help users handle epoxy products properly. It is recommended that users establish internal programs for occupational health and safety. In such programs this kind of information can serve as a general guide for the training of workers and supervisors. Questions on specific products should be directed to the manufacturer for detailed information.

### Recommended Practices for Handling Epoxy Resins, Related and Auxiliary Chemicals

Programs for the proper handling of epoxy resins and systems should include the following:

- **Administrative Controls**
- **Engineering Controls**
- **Operational Controls**
- **Personal Controls**

### Administrative Controls

#### Handling Instructions

Recommendations for proper handling, transport, and use should be obtained from the manufacturer or supplier. This information should be understood by all persons assigned to work with the materials prior to use or handling, and it should be readily available to anyone who needs it. To assist users in this responsibility, Material Safety Data Sheets and descriptive literature are available for all products.

#### Training

Supervisory personnel and employees engaged in operations involving these materials should be aware of the associated health effects and fire and safety hazards. Personnel should be trained in the proper use and handling of these products. This training should be under the supervision of a qualified industrial hygienist, medical personnel, or similarly qualified person.

#### Isolation of Operations

Since a small number of persons are sensitive to epoxy resins and/or auxiliary chemicals, the use of these materials should be confined, if possible, to designated work areas, preferably separate from the remainder of the plant.

#### Protective Clothing & Equipment

Persons handling resins, solvents, catalysts, hardeners, or reactive diluents should wear appropriate protective clothing and equipment such as gloves, rubber aprons, and chemical goggles or face shields as required to prevent contact of the material with the skin and eyes. Employees must be instructed on the proper use of such equipment.

Papertowels, soap, and waterless hand cleaner should be available in the work area as cleanup aids. Cleanup facilities such as lavatories and showers should also be available.

Safety showers and eye fountains or other low pressure water sources should be available for emergencies.

#### Housekeeping

The work area should be kept clean, uncluttered, and free of spills. Disposable covers such as kraft wrapping paper are recommended for spreading on work areas. These should be discarded at the end of the day, removing spills, drips, etc. Clean wipe cloths should be available to workers as needed. Covers and wipe cloths should be discarded by placing in a waste container for disposal in an appropriate disposal facility in compliance with local regulations. Dust from the resins or auxiliary materials should not be allowed to accumulate in the work areas or on ledges, beams, or other surfaces which may be obscured from view.

#### Personal Hygiene

All persons handling epoxy materials or auxiliary materials should be instructed to wash their hands thoroughly before each job break, before eating, smoking, drinking, or using toilet facilities.

#### Storage

Epoxy resins, curing agents and auxiliary materials should be stored in a cool place in tight, sturdy containers away from sparks and open flames.

#### Emptied Containers

Emptied containers will retain residual amounts of product(s) and can be hazardous. All label instructions and precautions should be observed for containers which are full, partially filled, or emptied.

Containers for epoxy resins and related materials are generally non-returnable and therefore not intended for reuse. These containers should be marked for disposal with the label prominently displayed and stored in such a manner to prevent inadvertent use of product or container pending disposal. If these recommendations are not followed and containers are reclaimed, do not reuse them until they have been thoroughly cleaned under the supervision of a qualified safety engineer or other qualified person who is aware of all of the potential hazards.

Disposal of containers should be consistent with the hazard information pertaining to the specific product as noted on the label or Material Safety Data Sheet for the product. Dispose of all containers in an approved waste disposal facility in accordance with all federal, state and local regulations. The drained material should be disposed of in the manner described on the Material Safety Data Sheet for the product.

### **Handling and Dispensing**

Resins, curing agents and auxiliary materials should be properly labeled to avoid improper use or indiscriminate handling. These materials should be dispensed only with proper instructions on proportions and mixing.

### **Emergency Instructions**

Supervisors and employees should be provided with instructions on what to do in case of an emergency. Minimum emergency instructions should include:

#### ***Fire & Explosion Emergencies-***

Specific instructions on prevention of fires and explosions should be provided for resin systems and formulations which contain flammable or combustible materials. Vapors can travel long distances to sources of ignition. Remove or extinguish all ignition sources before using flammable mixtures. For more complete information, consult the NFPA (National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471, USA) Fire Codes and Recommended Practices.

### ***First Aid Instructions-***

*Minimum First Aid Instructions Should Include:*

#### **Inhalation:**

Move the victim to fresh air. Administer artificial respiration (i.e., mouth-to-mouth resuscitation) if necessary to restore breathing. Administer oxygen if breathing is difficult. Get medical attention.

#### **Accidental Swallowing:**

If resins or auxiliary chemicals are swallowed, give the victim reasonably large amounts of water to swallow. Never give anything by mouth to an unconscious person. Follow instructions on the package label. Get medical attention immediately.

#### **Eye Exposure:**

If resins or auxiliary chemicals get into the eyes, flush immediately and continue for fifteen minutes at the eye fountain or similar low-pressure water source, holding the eyelids open. Get medical attention.

#### **Skin Contact:**

In case of skin contact with resin and/or auxiliary chemicals, remove shoes or clothing, scrape or wipe off excess and wash the affected area immediately with soap and water. If contaminated materials cannot be washed off, use a water less hand cleaner. The use of a water less hand cleaner must be followed immediately by a thorough soap-and-water wash. Contaminated clothing should be laundered before reuse; contaminated leather articles, including shoes, cannot be decontaminated and should be destroyed.

### **Sensitization**

Sensitization is the development of an allergic dermatitis or allergic respiratory response in susceptible individuals. It usually makes a delayed appearance after some weeks or even months of frequent and/or prolonged contact with the sensitizing agent. Following the development of sensitization to one component of epoxy resin formulation, susceptible persons may also become sensitized to other components.

Since sensitization effects may not be immediately apparent, workers may become careless in handling resin formulations. Appropriate administrative controls should be established and the workers should be instructed and reminded to handle these resin systems properly. Education of the worker on these facts and insistence that he or she uses the protection provided are of paramount importance in a preventive program.

Any employee who develops dermatitis or redness of the skin while handling resins or other materials should report this immediately to his or her supervisor who should refer such employees to an appropriate physician.

Employees who develop skin sensitization should be temporarily removed from exposure and further exposure permitted only when approved by a physician.

Employees who develop respiratory sensitization and display asthmatic symptoms may require permanent removal from further exposure to the causative material(s). Medical consultation on an ongoing basis is strongly recommended in such cases.

---

## **Engineering Controls**

### **Ventilation**

Fumes, vapors, or dust from resins, catalysts, curing agents, solvents, or auxiliary materials must be controlled in the workplace. Equipment for handling resins and auxiliary materials should be designed to provide, as nearly as possible, complete containment of these materials. If this is not possible, or if such designed equipment may under any conditions release these products, engineering controls, such as adequate local exhaust ventilation, should be provided in both the mixing and application areas. Equipment should be designed such that the vapors and dust are pulled away from and not into the breathing zone of the worker.

To minimize adverse health effects, workers should not be exposed to airborne contaminants in excess of the Threshold Limit Values (ACGIH) or the Permissible

Exposure Limits (OSHA). As an added benefit of controlling these low limits, the concentration of vapors and dust in the workplace will be far below the lower explosive limits and fire and explosion hazards will be minimized. Design considerations for engineering control should include explosion and fire hazards which could result from motors, drives, and other components.

If engineering controls do not maintain the concentration of air contaminants below the Permissible Exposure Limits, NIOSH-Approved respirators must be provided, but the latter should be used as temporary or emergency measures and not as a long term substitute for ventilation.

### **Industrial Hygiene Monitoring**

If a potential hazard is suspected, the best way to insure that the Threshold Limit Values or Permissible Exposure Limits are not exceeded is to conduct industrial hygiene monitoring, using standard sampling and analytical methods to measure the concentrations of vapor or dust contamination.

---

## **Operational Controls**

### **Mixing and Application**

Persons handling these materials should wear protective equipment such as chemical goggles or side-shield glasses, impervious aprons, gloves and foot-wear as required to prevent all contact with the skin and eyes.

If operations require heating or melting the resin, care should be exercised; hot or molten resin can cause severe burns.

When working in confined spaces such as tank interiors, NIOSH- Approved air-supplied respirators should be used. At least one other person should be immediately available outside the confined area in case assistance is required. Other recognized safety practices and procedures for work in confined spaces should be considered.

### **Curing Operations**

After the formulation has been applied, vapors of solvents, curing agents, and other auxiliary chemicals could be released. The same precautions and practices recommended for mixing and application operations should be followed.

### **Handling of Cured Resin Systems**

If appropriate precautionary measures are not established and observed, skin or respiratory problems may result from grinding, sandblasting, cutting or other finishing operations involving cured resins. These operations must be carried out with adequate ventilation and protective equipment. Dust concentrations in the workplace must be maintained below the permissible levels and lower explosive limits.

### **Housekeeping**

Tools, benches, hoods, and other work areas should be kept clean. Waste materials should not be allowed to accumulate in the work area. Crowded or cluttered work areas increase the potential for accidents, such as spills, breakage, using the wrong material, etc. Some workers, such as assistants who may clean the bench tops or equipment, or persons such as janitors who pick up materials for disposal may not be aware of the nature of materials being handled. These workers should be notified if the area, equipment, containers, etc., have been contaminated. They should also be instructed on cleanup and disposal procedures.

---

## **Personal Controls**

An effective preventative program requires the understanding, concern, diligence, and self-discipline of the worker. He or she should particularly observe the following recommendations -

Know the locations and proper use of:

- **Personal protective equipment and clothing such as aprons, gloves, footwear, chemical goggles or side shield safety glasses.**
- **Respirators**
- **Fire Extinguishers**
- **Eye Fountains**
- **Safety Showers**
- **First Aid Information**
- **Safety Instructions**
- **Fire Alarm**
- **Medical Assistance (hospital, physician and nurse phone numbers and location).**

The Worker Should Practice The Following:

- **Keep the work area as uncluttered and clean as possible.**
- **Clean up minor spills immediately.**
- **Keep tools clean and properly stored.**

- **Put trash in waste containers.**
- **Clean hands before each break and before using toilet facilities.**
- **At the end of the shift, wash up thoroughly.**

Persons working with resins and auxiliary material should understand that they have important roles in preventing adverse health hazards and fire and explosion hazards from developing into serious problems.

One of the greatest contributions the worker can make is to ask for information when there is any uncertainty about any part of the program.