

## **CWA Occupational Safety and Health Fact Sheet #10**

### **Solvents & the Workplace**

Organic solvents pose a potential threat to workers' health and efficiency in most occupations and industries. Solvents are substances used to dissolve other materials. For example, solvents may be used as degreasers for cleaning electrical contacts and for removing corrosion from materials. CWA members who work as telecommunications installation and repair technicians, cable splicers, outside plant technicians, central office technicians, manufacturing, and hospital workers frequently utilize solvents to perform their jobs.

A partial list of the solvents utilized by CWA members to perform their work includes: acetone, formaldehyde, methyl ethyl ketone, mineral spirits, perchloroethylene, toluene, trichloroethane, trichlorotrifluoroethane, and xylene. In addition, many CWA members have worked with extremely toxic and carcinogenic solvents such as benzene, carbon tetrachloride, and trichloroethylene that, in most cases, are no longer produced or have been replaced with less hazardous substitutes.

#### **Health Effects**

When exposure to one or more solvents equals or exceeds the prescribed Occupational Safety and Health Administration's (OSHA) permissible exposure levels (PEL), workers may experience associated health effects making it difficult for them to perform their job efficiently and in a safe and healthful manner. In some cases, these health effects may be irreversible and result in permanent damage. Health effects from exposure to solvents may range from simple objection to a low concentration odor to death at high concentrations or exposures.

The primary methods by which solvents enter a worker's body are through inhalation or breathing of airborne vapors, as well as absorption or skin contact and, possibly, ingestion (swallowing) of solvents.

Although a detailed analysis of the physiological effects of solvents cannot be accomplished in this fact sheet, certain generalizations can be made. For example,

- Inhalation of toxic solvent vapors may cause upper respiratory irritation and illness such as bronchial pain and bronchitis. In addition, inhalation of solvent vapors may affect the worker's central nervous system acting as depressants and anesthetics and, in turn, cause headaches, nausea, dizziness, drowsiness, unconsciousness, unusual behavior, and/or a general feeling of irritation or illness. These symptoms should be viewed as warning signs of potential disease. In addition, excessive and continuous exposure to the most toxic solvents may prove to be even more harmful, resulting in the development of cancer or other long-term diseases.
- Skin contact with and/or skin absorption of solvents occurs through direct immersion, splashing, spilling, solvent-soaked clothing, and contact with solvent-wet objects. Skin

contact with solvents may dissolve the body's natural barrier of fats and oils leaving the skin unprotected against irritation and harm. Solvent exposure can cause contact dermatitis, commonly referred to as skin rash or inflammation of the skin. In addition, excessive and continual exposure may produce skin diseases.

- Ingestion or swallowing of solvents occurs primarily as a result of a solvent-contaminated object such as one's fingers, food, or cigarette, coming into contact with the mouth, i.e., the lips or tongue. In turn, this exposure results in the worker swallowing (or absorbing) the solvent and contaminating the body.

When attempting to determine the relationship between solvent exposure and worker health effects (known as the "Cause and Effect" relationship), certain factors such as the identification of the solvent(s) to which the individual was/were exposed, the amount and concentration of solvent exposure(s), the length or duration of exposure(s), and the route of entry or method by which the solvent(s) entered the body must be investigated. In addition, such an investigation must include consideration of the presence and type of engineering, administrative, and personal protective controls as well as individual differences among workers based on sex, age, and the state of the individual worker's health and well-being.

### **Controlling the Hazard**

Based on the above information, CWA members should attempt to prevent/minimize solvent exposures. Given the toxicity associated with many of the different solvents CWA members work (and have worked) with and are exposed to, these efforts become all the more important. These include substances such as benzene, carbon tetrachloride, formaldehyde, Freon, methyl ethyl ketone, perchloroethylene, toluene, trichloroethylene, and xylene.

Whenever possible, employers should provide less toxic substitutes for more toxic solvents. Substitutes might include substances such as mineral spirits, waterless cleaners, and soap and water. The removal of the most hazardous solvents from the workplace should be an employer goal and CWA members should take the necessary steps to ensure that their workplace is free of highly toxic and hazardous solvents.

Where CWA members work with solvents, employers should, and in some cases, must provide employees with the necessary protective equipment. This would include gloves, goggles, face shields, non-porous aprons, protective clothing, and shoe covers. Regarding the use of protective gloves, employers should make certain that the most protective gloves are provided for the particular solvent(s) that is/are being used. Permeability or leakage measurements of gloves should be conducted by the employer before providing them to workers. Where airborne solvent concentrations are excessively high, the employer must provide CWA members with respiratory protection.

### **OSHA Standards**

Most solvents that CWA members work with are covered by OSHA Standards. These standards indicate the permissible "airborne contaminant" levels of exposure, and, in some cases, ceiling

levels to which workers may be exposed without causing detrimental health effects. If CWA members feel that they are being exposed to harmful concentrations of a particular solvent or solvents, they should ask their employer to conduct the necessary industrial hygiene tests to determine the airborne contaminant levels.

The Occupational Safety and Health Act of 1970 requires that all employers provide employees with a safe and healthful workplace. Part of this requirement indicates that the employer must:

- Provide employees with comprehensive training concerning the hazardous and toxic effects of solvents that workers use in the performance of their jobs.
- Where feasible, implement engineering controls such as closed systems and local exhaust ventilation equipment to eliminate or minimize occupational exposure to toxic solvents.
- In addition, where potential exposure to hazardous or toxic solvents exists, employers must have a comprehensive, written program of eliminating or minimizing the hazardous condition(s).

### **What Can You Do?**

All CWA members should make sure that their employer is maintaining a safe and healthful workplace. The key to making the workplace safe for all CWA members is strong, active local safety and health committees. The committee can identify dangerous conditions at the workplace and discuss them with management. If the employer refuses to resolve the safety and/or health hazards, the committee can request an OSHA inspection. The committee should always coordinate its activities through the local officers, the CWA Representatives, and the negotiated safety and health committees.

In addition, CWA members may obtain information and assistance by contacting the:

CWA Occupational Safety and Health Department

501 Third Street, NW

Washington, D.C. 20001-2797

Webpage: [www.cwasafetyandhealth.org](http://www.cwasafetyandhealth.org)

Phone: (202) 434-1160.

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