

Section 14

HAZARD COMMUNICATIONS (HAZCOM)

14.1 Working With Chemicals

The OSHA Hazard Communication (HAZCOM) (Right-To-Know) Standard requires all employees be given adequate information and training on the long- and short-term health effects of chemicals they work with. Your company has established a Hazard Communication (HAZCOM) Program to provide this information to you. You can take the steps necessary to safeguard your health by following the procedures established in this program.

A copy of this program – along with a chemical inventory list and corresponding Material Safety Data Sheets (MSDSs) are available for your review and is required to be kept at your local office and at all construction and major modernization jobsites or any other sites where you spend a full shift or eight hours. This program may be made available to others upon request to your Superintendent/Manager.

Chemicals affect the human body differently. The physical makeup of the chemical, the amount of exposure (time and quantity), and the manner in which the chemical is absorbed by the body all play a role in the resulting effects. As long as exposures are not excessive, many potentially dangerous substances are eliminated naturally from the body. It is important to remember that most materials can be removed this way, and their effects are usually not cumulative.

What is important is the dose or amount of a particular chemical that is absorbed over a period of time. Too much of a chemical, either all at once or over time, may be dangerous. Chemicals are absorbed into the body in three ways:

- (a) Inhalation – The chemical is taken in with the air we breathe, either as a vapor, dust, gas, fume or mist.
- (b) Ingestion – The chemical is ingested either intentionally or accidentally. It can be taken in with the food you eat (or drink) especially if you fail to wash your hands before eating or smoking.
- (c) Absorption – It is absorbed through the skin. This occurs for only a limited number of chemicals.

Inhalation is by far the most common way in which chemicals enter the body. How much enters and is subsequently absorbed through the lungs is a function of the chemical. The human respiratory system is extremely effective at removing dust from the air that is breathed. Only the smallest particles reach the lungs. The majority are trapped in the nose and throat, and later eliminated.

The amount of liquid chemicals entering the lung depends on how fast the liquid evaporated into the air. This is a function of the surrounding (ambient) temperature and the vapor pressure of the liquid (the higher the vapor pressure, the faster the evaporation rate). How much is absorbed varies with each chemical.

Industrial Hygienists are engaged in the science of protecting workers from the harmful effects of chemicals. They are trained to recognize, evaluate and control potential exposures to chemicals in the workplace. Today, many chemicals have been studied, and as a result, their effects have been identified. Levels of acceptable exposure for a normal work day have been determined. These are known as threshold limit values (TLV), or permissible exposure limits (PEL).

In general, there are two major types of effects which are of concern when talking about chemical exposure – the short term or acute effects, and the long term or chronic effects. Some chemicals have both, some one or the other.

Asbestos is an example of a substance that can result in chronic health effects. Asbestos fibers enter the body through inhalation of airborne asbestos particles and can become embedded in the tissues of the respiratory or digestive systems. Diseases associated with asbestos exposure often do not manifest themselves for 25-35 years following the start of exposure. The risk of disease is significantly increased when both asbestos exposure and smoking occurs.

Most acid gases exhibit only acute health effects. Exposure to acid gases can be extremely irritating, causing a sore throat, coughing and tearing of the eyes. However, once exposure stops, the effects generally pass with no lasting results. The exposure limits are designed to eliminate both short- and long-term symptoms.

Information on a particular chemical (or mixture of chemicals) can be found on the Material Safety Data Sheet (MSDSs) for that chemical. This gives the trade name, manufacturer, chemical components, exposure limits, effects of exposure, precautions to follow, as well as data on the vapor pressure, flammability, etc., and other physical data.

If you wish to know about a specific chemical you work with, talk to your Superintendent/Manager, review the MSDSs and discuss the procedures for handling the chemical established by your Elevator Company. Fortunately, most chemicals used in the elevator industry are of low toxicity, but like any chemical, must be used correctly to avoid hazardous conditions.

14.2 Oils and Grease

OSHA has established an exposure limit of 5 milligrams per cubic meter (mg/m^3) for oil mist in air. In the elevator industry, exposure results from physically handling the oil. Airborne exposures are virtually nonexistent. The biggest potential hazard results from contact with the oil (especially used oil) on the

skin. Use gloves where appropriate. Always wash your hands when they become oily – use soap and water.

14.3 Cleaners

Check the label on the container or the MSDS for the appropriate personal protective equipment to wear prior to working with any chemicals.

Three main types of cleaners are found in the elevator industry.

14.3.1. *Petroleum Naphthas*

- (a) These are petroleum distillates or naphtha-based cleaners commonly used for oil and grease removal. They have a relatively low volatility (do not evaporate fast) and low toxicity. They have an odor like gasoline or kerosene and are generally used in a liquid form, but may also be found in aerosol form.
- (b) Petroleum naphtha cleaners and vapors are flammable. They shall not be used around open flames, welding operations or other ignition sources. Exposure to high vapor concentrations can cause irritation of the eyes, nose and throat, nausea and headaches. Care should be taken to avoid using these materials in areas with inadequate air movement where the vapors can accumulate; ensure proper ventilation before, during and after use.
- (c) Excessive skin contact can cause defatting of the skin, which can lead to skin irritation. Good personal hygiene practices and the use of personal protective equipment (PPEs), such as rubber or neoprene gloves and chemical goggles, can minimize exposure.

14.3.2 *Hydrocarbons*

- (a) These have been used for cleaning electrical components such as controllers and motors. Due to the inherent safety issues with hydrocarbons, water-based cleaners shall be

used. They are usually found in aerosol form. There are two forms of hydrocarbon cleaner: halogenated and non-halogenated.

- (b) Halogenated hydrocarbons contain a high percentage of chlorofluorocarbons (CFCs), various combinations of fluorine and chlorine. Examples of CFCs found in halogenated hydrocarbon cleaners used in the elevator industry include 1,1,1-Trichloroethane (methyl chloroform), Trichloro-trifluoroethane (Freon 113), and dichlorodifluoromethane (Freon 12).

14.3.3 Water-Based Cleaners

- (a) Water-based cleaners are being used as an effective substitute for petroleum naphtha cleaners to remove oils and grease, but without the potential fire and health hazards posed by the chemical compounds found in the petroleum naphthas. Water-based cleaners are generally used in a liquid or semi-liquid (gel) form. They are also available for cleaning electric contacts (e.g. Simple Green, etc.).
- (b) Although the most prevalent ingredient in these cleaners is water, precautions are necessary. Repeated and prolonged skin contact can remove the oil from the skin, leading to irritation and possible infection. Good personal hygiene and the use of gloves and chemical goggles will limit exposure.

14.4 Babbitting

Babbit contains lead, which is a highly toxic material and shall be handled correctly. The primary route of exposure is through the inhalation of fumes, though ingestion can be significant if hands are not washed before eating or smoking. Repeated overexposure can result in elevated concentrations in the body, which is slowly eliminated when exposure ceases.

Significant lead fumes are only released when the lead approaches its boiling point, over 1000°F (537.8°C) which is well above the temperature used in babbitting operations, around 400°F (204.4°C). Adequate ventilation shall also be provided. Chronic overexposure to lead may cause damage to the blood-forming, nervous, urinary and reproductive systems of the body. Symptoms include loss of appetite, metallic taste in the mouth, excessive tiredness, constipation, nausea, nervous irritability, joint pain, tremors, weakness and dizziness.

- (a) Use wedge shackles when ever possible.
- (b) Protective face shields and gloves shall be worn while pouring babbit.
- (c) Preheat the bearing housing or shackle to be poured to be sure that it is dry. The presence of moisture will form captured steam and the hot babbit will explode.
- (d) Avoid breathing fumes. Melt and pour babbit in well-ventilated areas.
- (e) Wash hands prior to eating or smoking after handling babbit.
- (f) Do not use cutting torches to melt babbit. An electric melting pot shall be used, as it will not allow babbit temperatures to exceed a safe level.
- (g) Care shall be taken when using resins for socketing. Use only Company-approved heaters for curing. Do not allow the material to come into contact with exposed skin. Do not store the material in direct sunlight.

14.5 Painting

- (a) Some paints contain solvents that can be combustible or flammable. Some spray containers have flammable propellants. Some paints have undesirable odors.
- (b) Use spray paint only in well ventilated areas.
- (c) Field employees shall only use paints approved by their company. Follow the training you have been given and

follow the instructions for use on the container label. If you have concerns, contact your supervisor and review the material safety data sheets to be certain no hazard exists to yourself, fellow employees or the public.

14.6 Welding

- (a) Welding produces fumes from the metals being joined and the welding rods being used. In addition, radiation from the arc can damage the eyes, so appropriate goggles or a welding mask or hood shall always be used.
- (b) In the elevator industry, iron oxide fumes are the primary exposure encountered. The recommended exposure level is 5 mg/m³ (even in industrial environments where welding operations are continuous this level is seldom exceeded). Overexposure can cause welding fume fever which causes flu-like symptoms. Welder's exposure is further reduced by the welding mask or hood.
- (c) In cases where welding is to be performed on painted surfaces, the paint shall first be removed, using your company's approved method, in case the paint contains lead, which can rapidly vaporize during the welding process. Adequate ventilation must always be provided. (See Section 13.)
- (d) A MSDS is required for welding rods.

14.7 Asbestos

- (a) The term "asbestos" refers to a number of naturally occurring silicate materials. Asbestos in the forms of sprayed-on fireproofing, pipe insulation and acoustical plaster was used in commercial and residential buildings until the mid-to-late 1970s, when its use was banned.
- (b) The presence of asbestos-containing materials does not, in itself, present a health risk. Only when asbestos becomes airborne does it pose a potential hazard. Asbestos, con-

taining materials that are susceptible to contact, water damage and/or air flow are more likely to result in fibers being released. Only approved testing methods can determine whether asbestos is present, and at what levels.

- (c) Employees shall not perform any construction, maintenance or repairs in areas where there is a potential exposure to Presumed Asbestos Containing Material (PACM) or Asbestos Containing Material (ACM) in excess of the Personal Exposure Limits or in regulated areas in the normal scope of their work without first receiving the proper training and personal protective equipment for the type or class of work to be performed. If any employee is asked to enter such areas they shall first contact their supervisor for instructions, before entering the areas. Employees shall not, under any circumstances intentionally disturb, remove or clean up asbestos containing material without first contacting their supervisor.
- (d) **CAUTION** when drilling in doors that you suspect contain asbestos, special training and work practices are required. Contact your supervisor.

14.8 Flammable Liquids and Solvents

- (a) ONLY NON-FLAMMABLE PVC GLUE SHALL BE USED FOR BONDING SECTIONS OF IN-GROUND PVC HYDRAULIC JACK LINERS.
- (b) When using paints, solvents and chemicals, read the warning labels, appropriate MSDSs and follow instructions.
- (c) Avoid getting solvent on clothing. If clothing becomes contaminated, it shall be changed immediately.
- (d) Flames, sparks or any other ignition source shall be kept away from flammable liquids and their vapors. Smoking is prohibited in areas where such materials are used or stored, and "No Smoking" signs shall be posted in these areas.

- (e) Flammable liquids shall not be transferred from one container to another unless electrically interconnected.
- (f) Store in properly labeled safety cans or in original container if one gallon or less.
- (g) Flammable and combustible materials shall not be stored in areas used for exits, stairways or areas normally used for the safe passage of people.
- (h) Be sure there is adequate ventilation when storing flammable or combustible materials.
- (i) No more than 25 gal. (90.84 L) of such materials shall be stored in a room, unless an approved safety storage cabinet is provided.

14.9 Carbon Dust

Most electrical brushes expel carbon dust onto machine room equipment. When cleaning components, avoid irritation to skin and breathing passageways. You may want to consider wearing a dust mask and latex gloves or use a closed system (bonnet). Safety glasses/goggles are also required if liquid cleaning agents are being used.

14.10 Sulfuric Acid Type Batteries

- (a) Batteries may contain sulfuric acid and as such shall be handled with care. The acid is contained in a gel media and is not subject to leaking (unless case is cracked), however at high temperatures (greater than 140° F) the gel may liquefy causing leakage. Similarly discharged batteries may freeze at temperatures below 10° F which can crack the case and cause subsequent leakage.
- (b) Sulfuric acid is corrosive and can cause burns to the skin and eyes. Fumes can cause eye, nose and throat irritation, but significant fumes would only be generated in unusual circumstances if the battery were to become overheated.

- (c) Always use personal ground straps to dissipate static discharge if you must handle hot batteries. Battery cabinet shelves are to be lined with plastic to prevent leaking batteries from eating the shelf which, if undetected, may cause it to collapse.

NOTE: Sixteen 12V batteries in a series can generate up to 192 volts. Remember disconnecting the main line switch does not protect you. Use proper gloves and insulated tools and follow safe electrical work practices.

- (d) When working on or in rooms with sulfuric acid batteries the following items shall be kept onsite/inside the elevator machine room:
 - (1) One (1) Pair of Rubber Gloves
 - (2) One (1) Pair of Safety Goggles
 - (3) One (1) Spill Kit
 - (4) One (1) Rubber Apron
 - (5) One (1) Face Shield
 - (6) One (1) Eye Wash Kit
 - (7) One (1) Bottle of Sterile Water
 - (8) One (1) Box of Baking Soda
- (e) In addition, it is recommended that the proper warning signage be posted on the machine room door.
- (f) When handling or testing batteries, you shall wear gloves, apron and full face shield (and goggles) to avoid contact with acid which may leak from the battery.
- (g) If acid gas/fumes are detected, immediately exit the room and notify your supervisor.
- (h) Acid gas/fumes are readily detected by an irritation in the nose and throat.
- (i) As charging produces hydrogen which readily burns, machine rooms should be well ventilated to prevent hydrogen build up.

- (j) Smoking, flames or sparks shall be kept away from batteries. Use personal ground straps when handling hot batteries to control static discharge.
- (k) The following procedures should be followed in case of contact with acid:
 - (1) Eyes: Flush with water for 15 minutes – use eye wash in safety kit and follow up with ordinary water if necessary. Seek medical attention.
 - (2) Skin: Flush affected parts of the body with large amounts of water, then neutralize with baking soda or sodium bicarbonate and remove contaminated clothing. If the burn is severe, go immediately to the emergency room at the nearest hospital.
 - (3) Inhalation: Remove immediately to fresh air, if dizzy or unconscious, transport immediately to the emergency room at the nearest hospital.
 - (4) Ingestion: If sulfuric acid is swallowed, DO NOT INDUCE VOMITING, wash out the mouth with water, if milk is available drink as much as possible, if not, then drink as much water as possible and go immediately to the emergency room at the nearest hospital.
- (l) Before energizing equipment, ensure doors on battery compartment are closed. There have been isolated reports of batteries exploding when first put under load.
- (m) Batteries shall not be stacked on each other as this may crack the case.
- (n) Do not clean battery cases with cleaning solvents.
- (o) Return all used batteries to local office for proper disposal.
- (p) Be aware that all bottles of eye wash and boxes of baking soda are dated and shall be routinely checked and replaced as necessary. Make certain that a currently dated eye wash bottle and box of baking soda is available.

14.11 Radio Frequency (RF) Awareness

Radio frequency (RF) exposure may be encountered during machine-room access. Be aware and obey the following safety practices.

- (a) Be aware that RF energy exists.
- (b) Obey all posted signs.
- (c) Never stop directly in front of an antenna.
- (d) The maximum permissible exposures are set approximately 10 times lower than the levels that are known to cause adverse effects. ANSI has guidelines for these limits.
- (e) Never touch an antenna. Touching un-insulated antennas or other un-insulated objects on an antenna may cause burns. Most antennas are insulated by a fiberglass coating for your protection.
- (f) Assume that all antennas are active and maintain a minimum of 3-ft. safe distance per FCC guidelines. Some communication providers recommend maintaining a 7-ft. distance from the emitting source.
- (g) As a precaution, if a pacemaker is worn, you should consult your physician before entering an outlined area around an antenna.
- (h) Effects of RF exposure do not accumulate over time.
- (i) Prolonged exposure to low levels of RF energy are not considered to be a health risk.
- (j) Prolonged exposure to sufficiently high levels of RF energy can cause a buildup of heat.
- (k) Contact your supervisor if you have concerns.