



TDCJ Risk Management's Training Circular

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Risk Management Issues

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January Chemical Safety



It's the time of year when facilities begin to compile their workplace chemical lists in efforts to submit their Tier II report.

What better time is there to bring up the subject of chemical safety?



Definitions

“Chemical” is any element, chemical compound, or mixture of elements and/or compounds.

“Expose or Exposure” is subjected to a hazardous chemical in the course of employment through any route of entry, including inhalation,

ingestion, skin contact, or absorption. “Handle” is to touch, move, or manipulate hazardous chemicals.



“Hazardous Chemical” is any chemical that is identified by the manufacturer as having the capability of producing adverse effects on the health.

“Health Hazard” is a chemical or other substance for which there is statistically significant evidence that acute or chronic health effects may occur in exposed individuals.

The term “health hazard” includes chemicals, which are carcinogens, toxic or highly toxic agents, reproductive

toxins, irritants, corrosives, sensitizers, and other agents, which damage the lungs, skin, eyes, or mucous membranes.

“Toxic Material” is a substance through which a chemical reaction or mixture can produce possible injury or harm to the body by entry through the skin, digestive tract, or respiratory tract. The toxicity is dependent on the quantity absorbed and the rate, method, site of absorption, and the concentration of the chemical.



“Personal Protective Equipment” (PPE) is the protective clothing (e.g., gloves, safety glasses, safety harness, res-

pirator) or like items intended to be worn by an individual to create a barrier against workplace hazards.

"Physical Hazard" as defined by OSHA standard 29 CFR 1910.1200 ©, a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable or reactive.



Texas Hazard Communication Act

The Texas Hazard Communication Act (TTCA) requires public employers to provide information regarding hazardous chemicals workers may be exposed to in the workplace. Hazard determination is the responsibility of the chemical manufacturer.

Persons authorized to use, handle or are subject to exposure due to reasonably foreseeable emergencies are informed about those hazards via Material Safety Data Sheets (MSDS) or Safety Data



NOTICE TO EMPLOYEES

Sheets (SDS), as well as primary container labels provided by the manufacturer.

Safety Data Sheets

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products.



The SDS have 16 sections and include pictograms and important information such as Identification, hazards, composition/ingredients, first-aid measures, fire-fighting measures, accidental release measures, handling and storage precautions, exposure controls/PPE, etc.

Routes of Entry into the Body

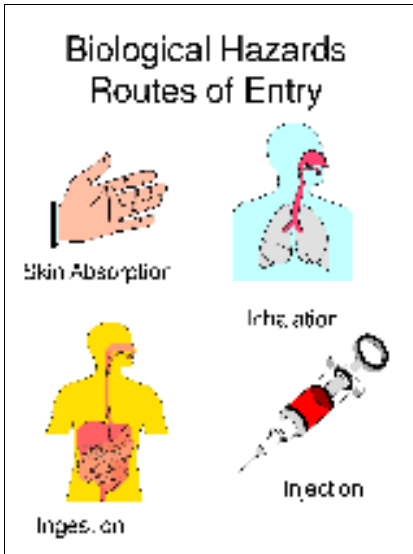
There are four main routes by which hazardous chemicals enter the body:

Absorption through the respiratory tract via inhalation.

Absorption through the skin

via dermal contact.

Absorption through the digestive tract via ingestion. (Ingestion can occur through eating or smoking with contaminated hands or in contaminated work areas.)



Absorption through percutaneous challenge (syringe needle or broken glass). This is possible but not a common route of exposure. However, needle sticks are significant routes of exposure in biomedical, health care and radiological work.

Most exposure standards, such as the Threshold Limit Values (TLVs) and Permissible Exposure Limits (PELs), are based on the inhalation route of exposure. These limits are normally expressed in terms of either parts per million (ppm) or milligrams per cubic meter (mg/m³) concentration in air. If a significant route of exposure for a substance is through skin contact, the MSDS, PEL and/or TLV

will have a "skin" notation.

Types of Effects

How the body reacts to chemical exposure can vary. Below are several types of common effects of chemical exposures:

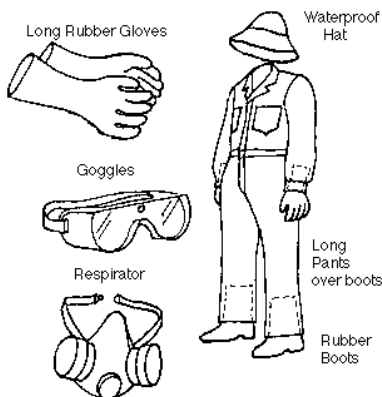
- An acute effect is characterized by sudden and severe exposure and rapid absorption of the substance. Normally, a single large exposure is involved.
- A chronic effect is characterized by prolonged or repeated exposures of a duration measured in days, months or years. Symptoms may not be immediately apparent. Health effects are often irreversible. Examples: lead or mercury poisoning.
- A local effect refers to an adverse health effect that takes place at the point or area of contact (skin, the respiratory tract, eyes, etc.). Absorption does not necessarily occur.
- A systemic effect refers to an adverse health effect that takes place at a location distant from the body's initial point of contact and presupposes absorption has taken place.
- Cumulative poisons build up in the body as a result of numerous chronic exposures. The effects are not

apparent until a critical point is reached.

- Synergistic effect: When two or more hazardous materials are present at the same time, the resulting effect can be greater than the effect anticipated based on the cumulative effect of the individual substances. This is also called "potentiating effect."

Personal Protective Equipment (PPE)

Understanding how hazardous chemicals enter the body is crucial in the selection of Personal Protective Equipment (PPE). Each department supervisor shall ensure adequate and appropriate PPE is provided to staff and offenders dispensing and using hazardous chemicals in accordance with the manufacturer's specifications identified on the respective MSDS.



Information regarding PPE can be found on the manufacturer provided SDS and pri-

mary labels. Additional information regarding PPE can be found in Environmental Advisory EA-05.09 Hazard Communication Program Table II. *Barriers to Prevent Contact with Chemical Hazards.*

Injury Reporting

Employees and offenders shall report all injuries to their supervisor immediately. Supervisors shall report injuries in accordance with agency policy. If the injury directly or indirectly involves chemical exposure or involves lack of air, and is fatal to one or more employees or results in the hospitalization of five or more employees, the accident shall be reported to the Texas Department of State Health Services (TDSHS), Toxic Substance Control Division, Hazard communication Branch within 48 hours after the occurrence.

Safe Work Practices

By following safe practices when using chemicals, employees can protect themselves against chemical haz-



ards.

chemicals and their use?

- Always read the labels on the products before you use them.

Are all containers labeled as to their contents and appropriate hazards as stated on the MSDS?

- Understand the hazards and how to protect yourself.

Are chemicals being stored and accounted for in accordance with the requirements based on the information found on the MSDS and agency policy?

- Do not mix chemicals! For example, never mix bleach with ammonia.

- Learn emergency procedures in case you or others are exposed to chemical splash or fumes. These procedures can be found on the MSDS.

Is there appropriate personal protective equipment available and is its use being enforced?

- Keep containers closed when not in use. Store chemicals in original containers in a cool, dry place.

You Have a Right to Know and an Obligation to Use Your Knowledge to Work Safely!

- Only use chemicals in well-ventilated areas.

Self Evaluation

References

Each department should evaluate their areas and identify all chemicals within their department and ask a few simple questions to determine if chemical safety is being followed:

Lawrence Berkley National Laboratory, Environmental Health and Safety Division
<http://www.lbl.gov/ehs/chsp/html/toxicology.shtml>

Is the chemical needed? Is there a safe alternative?

National Institute of Occupational Safety and Health (NIOSH). www.cdc.gov.

Are Material Safety Data Sheets (MSDS) available?

TDCJ AD-03.16 Chemical Control and Accountability.

Are affected employees and offenders trained on the hazards associated with such

TDCJ Environmental Advisory EA-05.09 Hazard Communication



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