



Occupational Exposure to Hazardous Chemicals in Laboratories

- ***29 CFR 1910.1450***

Objectives

- In this course, we will discuss:
 - Scope and application
 - Definitions
 - Employee exposure determinations
 - Chemical hygiene plan
 - Employee information and training
 - Medical consultation and examinations
 - Physician's written opinion
 - Hazard identification
 - Recordkeeping
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Scope and Application

1910.1450(a)

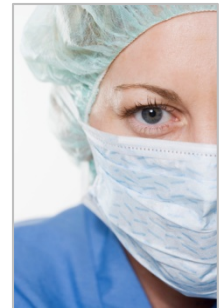
- Applies to employers engaged in *laboratory use of hazardous chemicals*



Scope and Application

1910.1450(a)

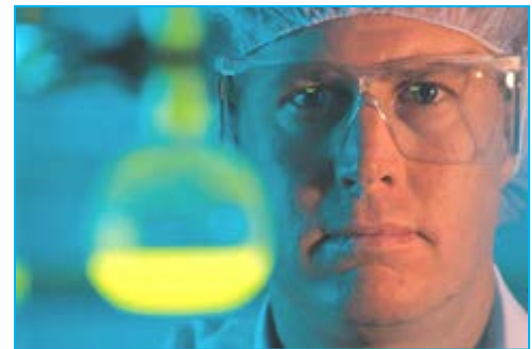
- Supersedes all OSHA health standards in 29 CFR 1910, Subpart Z, **except**:
 - Employee exposure shall not exceed PELs already set by other standards.
 - Prohibition of skin and eye contact set by other standards shall be observed.
 - Where action level is routinely exceeded for a regulated substance, exposure monitoring and medical surveillance requirements apply.



Scope and Application

1910.1450(a)

- Does not apply to:
 - Uses of hazardous chemicals which do not meet the definition of laboratory use
 - Lab use of hazardous chemicals having no potential for exposure, such as:
 - » Chemically-impregnated test media
 - » Commercially prepared kits such as those used to perform pregnancy testing



- **Chemical Hygiene Officer**

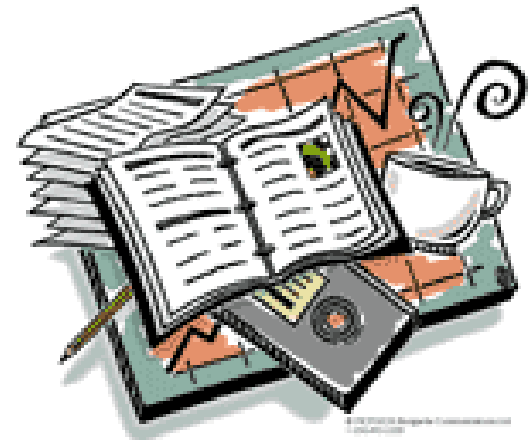
- Employee designated by employer who has training or experience to provide technical guidance in the development and implementation of the Chemical Hygiene Plan.

- » Definition not to place limitations on position description currently held by individual



- **Chemical Hygiene Plan**

- Written program developed and implemented that sets forth procedures, equipment, personal protective equipment and work practices that protect employees from health hazards presented by hazardous chemicals used in the workplace



Definitions

1910.1450(b)

- **Hazardous chemical**

- Chemical that has statistically significant evidence that acute or chronic health effects may occur in exposed employees.
- “Health hazard” includes carcinogens, toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic systems, those that damage the lungs, skin, eyes, or mucous membranes.



Definitions

1910.1450(b)

- **Laboratory**

- Facility where the “laboratory use of hazardous chemicals” occurs.

- » It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.



- **Laboratory scale**

- Work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person.
- “Laboratory scale” excludes workplaces whose function is to produce commercial quantities of materials.



- **Laboratory use of hazardous chemicals**

- Means handling or use of chemicals in which all of the following conditions are met:

- » Chemical manipulations are carried out on a “laboratory scale”
 - » Multiple chemical procedures or chemicals are used
 - » Procedures involved are not part of a production process, nor simulate a production process
 - » “Protective laboratory practices and equipment” are available and in common use to minimize the potential for employee exposure to hazardous chemicals
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- **Select carcinogens**

- Regulated by OSHA as a carcinogen; **or**
 - Listed under category “known to be carcinogens” by National Toxicology Program (NTP); **or**
 - Listed under Group 1 (“carcinogenic to humans”) by the International Agency for Research on Cancer Monographs (IARC); **or**
 - Listed in Group 2A or 2B by IARC or under category “reasonably anticipated to be carcinogens” by NTP, and causes statistically significant tumor incidence in experimental animals
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Permissible Exposure Limits

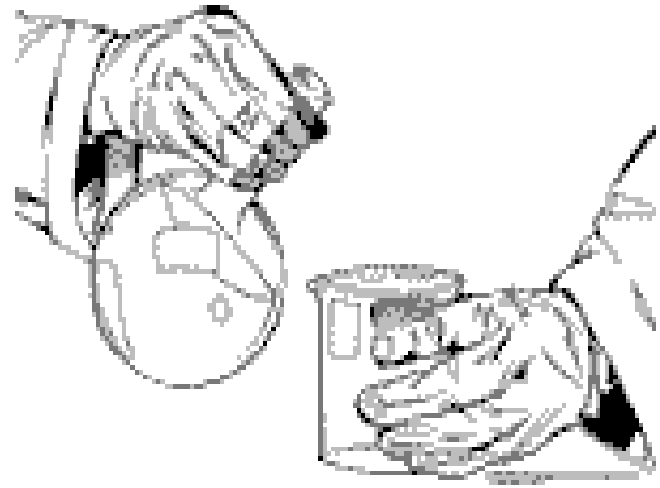
1910.1450(c)

- For laboratory uses of *OSHA regulated substances*
 - Employer shall assure employee exposure to such substances **does not exceed** permissible exposure limits (PEL).



Employee Exposure Determination 1910.1450(d)(1)

- Initial monitoring
 - Employer shall measure employee's exposure to regulated substances if there is reason to believe that exposure levels routinely exceed the action level.



Employee Exposure Determination 1910.1450(d)(2)-(3)

- Periodic monitoring
 - If initial monitoring discloses employee exposure over the action level, the employer shall comply with exposure monitoring provisions of the relevant standard.
- Termination of monitoring
 - Monitoring may be terminated in accordance with relevant standard.



Employee Exposure Determination 1910.1450(d)(4)

- Employee notification of monitoring results
 - Within 15 working days after the receipt of monitoring results, employer must notify employee of results
 - » Written individually, **or**
 - » Posting in an appropriate location accessible to employees

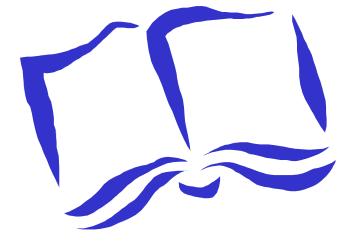




Chemical Hygiene Plan

1910.1450(e)(3)

- Where hazardous chemicals are used in the workplace, the employer shall develop and carry out the provisions of a **written** Chemical Hygiene Plan
 - Capable of protecting employees from health hazards associated with laboratory chemicals
 - Capable of keeping exposures below the PELs
 - Chemical Hygiene Plan shall be readily available



Chemical Hygiene Plan

1910.1450(e)(3)

- Include the following elements and measures taken to ensure laboratory employee protection:
 - Standard operating procedures relevant to safety and health
 - Criteria employer will use to determine and implement control measures to reduce employee exposure
 - Ensure fume hoods and protective equipment are functioning properly
 - Provisions for employee information and training

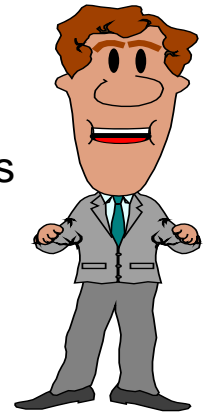
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Chemical Hygiene Plan

1910.1450(e)(3)

- Circumstances under which a particular laboratory operation, procedure or activity requires prior approval before implementation
- Provisions for medical consultation and medical examination
- Assignment of a Chemical Hygiene Officer
- Provisions for additional employee protection for work with particularly hazardous substances
 - » Specific consideration:
 - Establishment of a designated area
 - Use of containment devices such as fume hoods or glove boxes
 - Procedures for safe removal of contaminated waste
 - Decontamination procedures



Chemical Hygiene Plan

1910.1450(e)(4)

- Review and evaluate the effectiveness of the Chemical Hygiene Plan at least annually and update as necessary

CHEMICAL HYGIENE PLAN

FOR

(Company Name)

The general intent of the chemical hygiene plan for _____ (insert company name) is:

1. To protect laboratory employees from health hazards associated with the use of hazardous chemicals in our laboratory,
2. To assure that our laboratory employees are not exposed to substances in excess of the permissible exposure limits as defined by OSHA in 29 CFR 1910 Subpart Z.

The plan will be available to all employees for review and a copy will be located in the following areas:

This plan will be reviewed annually by _____ (insert name or position), and updated as necessary.

_____ (insert name) is designated as the Chemical Hygiene Officer (CHO). (See sections VI and VII for details.)

I. **STANDARD OPERATING PROCEDURES** to be followed in the laboratory relevant to safety and health when using chemicals.

(These are general procedures of laboratory operation which you likely already have in effect. Section E of Appendix A or 1910.1450 list the following conditions.)

- A. Accidents, spills;
- B. Avoidance of routine exposure;
- C. Choice of chemicals;
- D. Eating, drinking, smoking, etc.;
- E. Equipment and glassware;
- F. Exiting;
- G. Horseplay;

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Employee Information and Training

1910.1450(f)(1)-(2)

- Provide employees with information and training of chemicals in their work
- Provided at time of initial assignment and prior to assignments involving new exposures
- Frequency of refresher information and training determined by employer



Employee Information and Training

1910.1450(f)(3)

- Information includes:
 - Contents of standard and its appendices
 - Location and availability of Chemical Hygiene Plan
 - Permissible exposure limits or recommended exposure limits for hazardous chemicals
 - Signs and symptoms of exposures to chemicals
 - Location and availability of reference material on hazards, safe handling, storage and disposal of hazardous chemicals



Employee Information and Training

1910.1450(f)(4)

- Training includes:
 - Methods and observations used to detect presence or release of hazardous chemical
 - Physical and health hazards of chemicals
 - Measures employees can take to protect themselves from these hazards
 - Details of the Chemical Hygiene Plan



Medical Consultation and Examinations 1910.1450(g)(1)

- Employees provided an opportunity to receive medical attention, including follow-up examinations, deemed necessary by physician
 - Employee develops signs or symptoms
 - Exposure monitoring reveals an exposure level routinely above action level
 - Event resulting in hazardous exposure



Medical Consultation and Examinations 1910.1450(g)(2)

- Medical examinations and consultations
 - Performed by or under the direct supervision of a licensed physician
 - Provided without cost to employee, without loss of pay
 - At reasonable time and place



Information Provided to Physician 1910.1450(g)(3)

- Employer provides to physician
 - Identity of hazardous chemical(s) to which employee may have been exposed
 - Description of conditions under which exposure occurred including quantitative exposure data
 - Description of signs and symptoms that employee is experiencing



Physician's Written Opinion

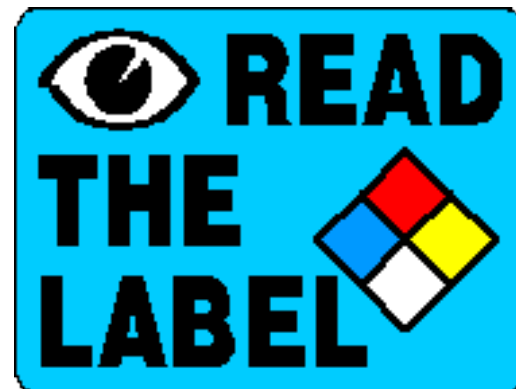
1910.1450(g)(4)

- For examination or consultation, employer shall obtain written opinion that includes:
 - Recommendation for further medical follow-up
 - Results of examination and associated tests
 - Medical condition which may place employee at increased risk
 - Statement that employee has been informed by physician of examination results and medical conditions that may require treatment
 - Not reveal findings unrelated to occupational exposure
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Hazard Identification

1910.1450(h)(1)

- Labels and material safety data sheets (MSDS)
 - Ensure labels on incoming containers of hazardous chemicals are not removed or defaced
 - Maintain MSDSs that are received with incoming shipments of hazardous chemicals
 - » Readily accessible to laboratory employees



Use of Respirators

1910.1450(i)

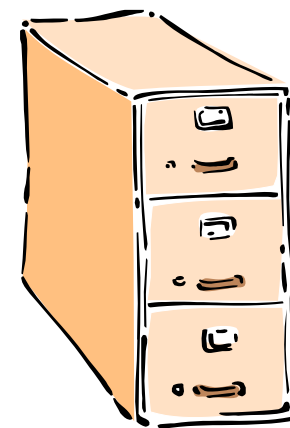
- Proper respiratory equipment provided at no cost to employee
- Selected and used in accordance with requirements of 29 CFR 1910.134



Recordkeeping

1910.1450(j)

- Establish and maintain records of:
 - Measurements taken to monitor employee exposures
 - Medical consultation and examinations including tests or written opinions
- Records must be kept, transferred, and made available in accordance with 29 CFR 1910.1020



Summary

- In this course, we discussed:
 - Scope and application
 - Definitions
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 - Physician's written opinion
 - Hazard identification
 - Recordkeeping



Thank You For Attending!

Final Questions?
