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# Occupational Exposure to Hexavalent Chromium [Cr(VI)]

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EFCOG/DOE Chemical Management Workshop

March 13, 2007

# What is Hexavalent Chromium?

- Toxic form of chromium metal that is generally man-made
- Used in many industrial applications primarily for its anti-corrosive properties
- Created during certain “hot” work processes where the original form of chromium was not hexavalent

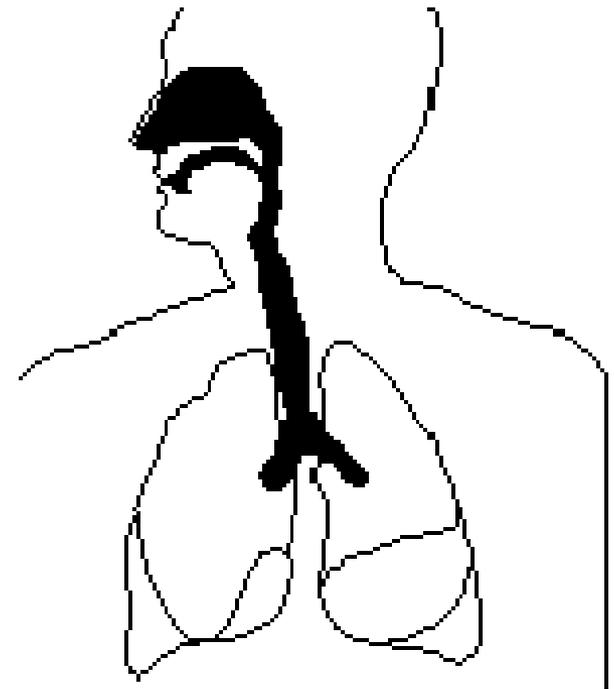


# How Can Occupational Exposures to Hexavalent Chromium Occur?

- Inhalation of mists, dusts or fumes created during processes involving the use of Cr(VI) compounds or hot processes that cause the formation of Cr(VI)
- Eye or skin contact with powders, dusts or liquids containing Cr(VI)

# Major Health Effects

- Lung cancer
- Nasal septum ulcerations and perforations
- Asthma
- Skin ulcers
- Allergic and irritant contact dermatitis



# Three Cr(VI) Standards

- 1910.1026 General Industry
- 1926.1126 Construction
- 1915.1026 Shipyards

# Major Provisions of the Standards

- Scope
- Permissible Exposure Limit (PEL)
- Exposure Determination
- Regulated areas \*\*
- Methods of Compliance
- Respiratory Protection
- Protective Work Clothing and Equipment
- Hygiene Areas and Practices
- Housekeeping \*\*
- Medical Surveillance
- Communication of Hazards
- Recordkeeping
- Dates

\*\* General industry only

# Scope: Who is Covered by the Standard?

All occupational exposures to Cr(VI) compounds **except**:

- Exposures that occur in the application of pesticides
- Exposures to portland cement
- Where employers have objective data demonstrating that a material containing chromium or a process involving chromium cannot release Cr(VI) in concentrations at or above  $0.5 \mu\text{g}/\text{m}^3$  as an 8-hour time-weighted average (TWA) under any condition of use

# Permissible Exposure Limit (PEL) and Action Level (AL)

- PEL: 5  $\mu\text{g}/\text{m}^3$  – TWA
- AL: 2.5  $\mu\text{g}/\text{m}^3$  - TWA

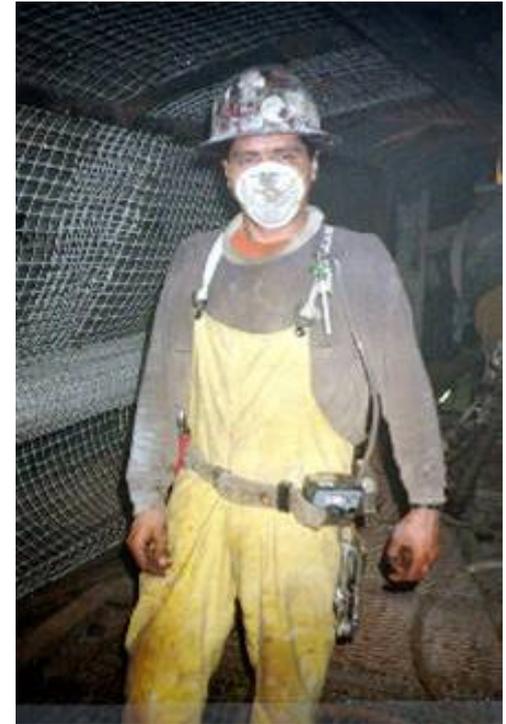
# Exposure Determination

Two options allowed for determining employee exposures:

- Scheduled monitoring option
- Performance-oriented option

# Scheduled Monitoring Option

- Prescribes a schedule for performing initial and periodic personal monitoring
- If initial monitoring indicates exposures are:
  - Below the AL: monitoring can be discontinued
  - At or above the AL: monitor every 6 months
  - Above the PEL: monitor every 3 months



# Performance-Oriented Option

- Exposures characterized using any combination of air monitoring data, historical monitoring data or objective data
- No fixed schedule for performing periodic monitoring

# General Requirements for Exposure Determination

- Affected employees must be notified where exposures exceed the PEL
- Methods used for air monitoring and analysis must be sufficiently accurate
- Employees or their representatives must be allowed to observe Cr(VI) monitoring

# Regulated Areas

- For general industry employers only
- Areas where exposures exceed or can be reasonably expected to exceed the PEL
  - Must be demarcated from other areas
  - Must limit access to employees who have a need to be there

# Methods of Compliance: What methods must employers use to achieve the PEL?

- Establishes engineering and work practice controls as the primary means of achieving the PEL
- Exceptions:
  - Painting aircraft or large aircraft parts
  - Processes or tasks that do not result in exposures above the PEL for 30 or more days per year
- Prohibits job rotation to achieve compliance with the PEL

# Respiratory Protection

Respirators and a program per 29 CFR 1910.134 required during:



- Periods necessary to install or implement feasible engineering and work practice controls
- Maintenance or repair operations where engineering and work practice controls are infeasible
- Operations where all feasible controls have been used and exposures are still above the PEL
- Operations where exposures do not exceed the PEL for 30 or more days per year
- Emergencies

# Protective Work Clothing and Equipment

- Required where a hazard is present or is likely to be present from skin or eye contact with Cr(VI)
- Not linked to the PEL
- Provided and paid for by the employer
- Cr(VI)-contaminated clothing and equipment must be removed when work shift or task is completed
- Special provisions for cleaning, storage and labeling of Cr(VI)-contaminated clothing and equipment



# Hygiene Areas and Practices

- Must provide change rooms and washing facilities per 29 CFR 1910.141
- Employees must wash their hands and face at the end of a work shift and prior to eating, drinking, smoking, etc.
- Employer-provided eating areas must be kept as free as practicable of Cr(VI)
- No eating, drinking, smoking etc. in regulated areas



# Housekeeping

- For general industry employers only
- Keep all surfaces as free as practicable of accumulations of Cr(VI)
- Use HEPA vacuums or other methods that minimize exposure to Cr(VI)
- Use of compressed air prohibited unless:
  - Used in conjunction with a ventilation system to capture the dust cloud created by the compressed air, or
  - No alternative method is feasible
- Dispose of Cr(VI)-contaminated waste in labeled, impermeable bags/containers



# Medical Surveillance

- Provisions for conducting baseline and periodic health assessments of exposed employees
- Performed by or under the supervision of a physician or other licensed health care professional (PLHCP)
- Provided at no cost to employee and at a reasonable place and time

# Which Employees Must Be Provided Medical Surveillance?

- Exposed at or above the action level ( $2.5 \mu\text{g}/\text{m}^3$ ) for 30 or more days per year
- Experiencing signs or symptoms of Cr(VI) exposure
- Exposed in an emergency



# What Must the Medical Examination Include?

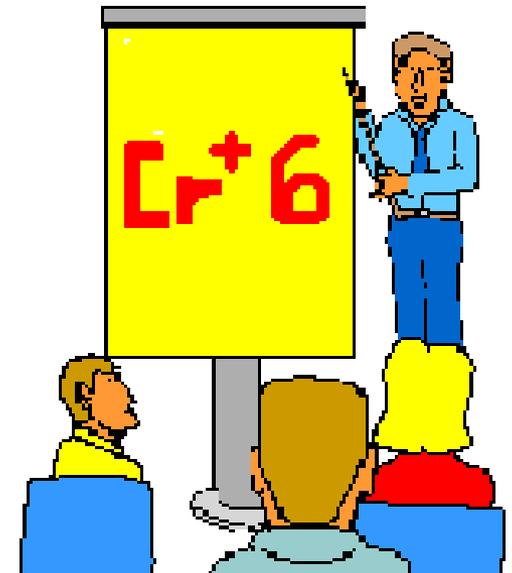
- Medical and work history, with emphasis on:
  - Cr(VI) exposure (past, present, future)
  - History of respiratory system dysfunction
  - History of asthma, dermatitis, skin ulceration or nasal septum perforation
  - Smoking status and history
- Physical examination, with emphasis on the respiratory tract and skin
- Any additional tests deemed appropriate by the PLHCP

# When Must Medical Examinations Be Offered?

- Within 30 days after initial assignment and annually thereafter
- Within 30 days after a PLCHP recommends additional examinations
- When employees shows signs or symptoms of Cr(VI) exposure
- Within 30 days after exposure during an emergency
- At the termination of employment

# Communication of Hazards

- Provide employee training in accordance with OSHA's Hazard Communication standard (29 CFR 1910.1200)
- Additional training on the contents of the Cr(VI) standard and the purpose and description of the medical surveillance program required by the standard



# Recordkeeping

- Must maintain records per 29 CFR 1910.1020 for:
  - Air monitoring data
  - Historical monitoring data
  - Objective data
  - Medical surveillance information, including:
    - PLHCP's written opinions
    - Information provided to the PLHCP
- No requirement to maintain training records



# When Must Employers Comply with Provisions of the Standards?

## Start-up dates:

- All provisions except engineering controls
  - For small employers (19 or fewer employees):  
May 30, 2007
  - For all others: Nov. 27, 2006
- Engineering Controls
  - For all employers: May 31, 2010

# Major Industries/Operations Covered by the Cr(VI) Standard

- Electroplating
- Welding on stainless steel or Cr(VI) painted surfaces
- Painting
  - Aerospace
  - Auto body repair
- Chromate pigment and chemical production
- Chromium dye and catalyst production
- Glass manufacturing
- Plastic colorant production
- Construction
  - Traffic painting
  - Refractory brick restoration
  - Paint removal from bridges

# Top Three Industries/Operations Covered

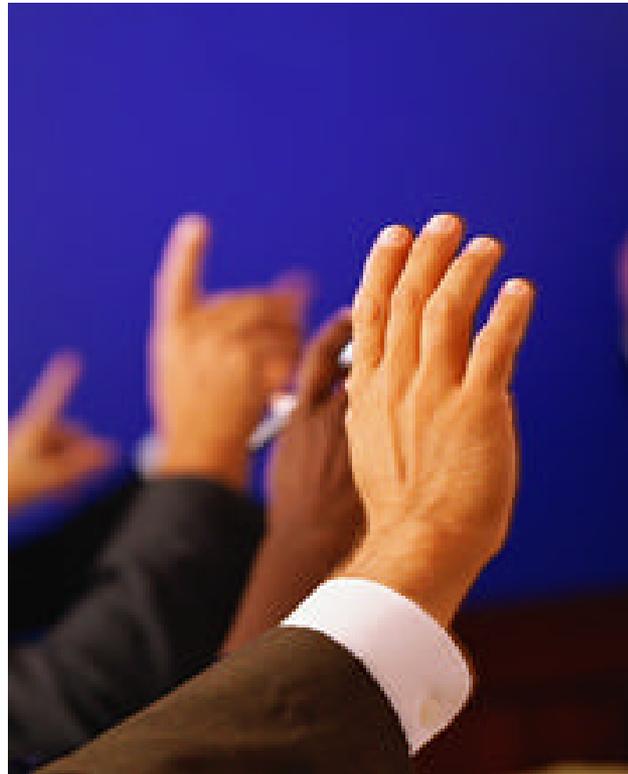
- Welding - 269,380 (48%)\* employees
- Painting - 81,893 (15%)\* employees
- Electroplating - 66,857 (12%)\* employees

\* % of total employees (558,451) covered by the standard

# Guidance and Outreach

- Small Entity Compliance Guide – available at [http://www.osha.gov/Publications/OSHA\\_small\\_entity\\_comp.pdf](http://www.osha.gov/Publications/OSHA_small_entity_comp.pdf)
- Compliance Directive
- Other guidance products

# Questions?



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