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# HEXAVALENT CHROMIUM

## SAFETY ISN'T JUST FOR THE HEX OF IT.

### PURPOSE

The purpose of this procedure is to provide guidance on the potential for exposure to Hexavalent Chromium (Cr VI). Subcontractors may utilize their own Cr VI exposure procedures upon review and approval from project supervision.

Cr VI can be formed as dust or fume when performing hot work.

This occurs when performing hot work on chromium-containing metals, such as stainless steel, high chrome alloys (9% chrome or greater), or chrome-coated metals.

In these situations, the chromium is not originally hexavalent, but the high temperatures involved in the hot work process result in oxidation that converts the chromium to a hexavalent state. Also, welding rods containing chromium can produce hexavalent chromium dust and fumes.

This program is based on historical and objective data and constructed to conservatively ensure that no individuals involved in Cr VI-related activities are exposed above the permissible exposure limit (PEL). The PEL for Cr VI is 5.0 µg/m<sup>3</sup>, which means personal exposure to airborne concentrations of Cr VI shall not meet or exceed 5 micrograms per cubic meter of air (5µg/m<sup>3</sup>) calculated as an 8-hour time-weighted average (TWA). The action level for Cr VI is any airborne exposure meeting or exceeding 2.5 micrograms per cubic meter of air (2.5 µg/m<sup>3</sup>) calculated as an 8-hour time-weighted average (TWA).

### ROLES & RESPONSIBILITIES

#### Project Supervision

- Identify chromium-containing materials that can be sources of Cr VI.
- Identify job tasks that have high Cr VI exposure potential.
- Establish appropriate controls to prevent exposure to Cr VI.
- Ensure employee-owner awareness and training has been conducted by the Safety Manager to meet the objectives of this procedure.

#### Employee-owners

- Through training, have the awareness and knowledge concerning operations that involve chromium-containing materials and the potential of exposure to Cr VI.
- Stop work if directed to perform work on chromium-containing materials without proper controls in place.
- Ensure that all processes within this procedure are followed.

### PROCEDURES

#### Exposure Assessment

- For each work activity with potential exposure to Cr VI, an exposure determination must be made so that proper controls and practices can be implemented.
- Once it is determined that the task will involve potential Cr VI exposure, the Hexavalent Chromium Exposure Assessment Matrix will be used to determine appropriate ventilation, personal protective equipment, and regulated area controls, if applicable.
- The requirements included within the Hexavalent Chromium Exposure Assessment Matrix are based on one or more of the following:
  - + Historical data
  - + Subjective Data
  - + Objective Data
- For tasks that do not fall within the Hexavalent Chromium Exposure Assessment Matrix, the Safety Manager is to be contacted for direction on the potential need for exposure monitoring and to determine appropriate controls for the task.

#### ENGINEERING CONTROLS TO REDUCE EXPOSURE

Engineering controls (ventilation) shall be the primary method to control Cr VI exposures below the PEL.

- Employee-owners shall not be rotated to different tasks in order to circumvent protective measures outlined in the Hexavalent Chromium Exposure Assessment Matrix.
- Local exhaust ventilation will be the primary means of engineering controls and shall be placed near the employee-owner performing the work, within 15 inches of the hot work being performed, and provide a rate of air-flow sufficient to maintain a velocity of 100 feet/minute (fpm).
  - + An example of local exhaust ventilation would be a “smoke eater” with HEPA filtration.
- When local exhaust ventilation is not feasible, general mechanical ventilation will be utilized.
  - + General mechanical ventilation will be of sufficient capacity and so arranged to control welding fumes and smoke.
- Additional work methods shall be utilized to reduce the potential exposure such as work practices that keep employee-owners out of fumes or dust.

#### CR VI REGULATED AREAS

- If the Hexavalent Chromium Exposure Assessment Matrix indicates that regulated areas are required for the work task, the following apply:
  - + The area shall be demarcated from the rest of the workplace so that its boundaries alert individuals of the regulated area. Means of demarcation may include ropes, hard barricades, or barricade tape and signage.
  - + The regulated area shall ensure any individual outside of the regulated area is not exposed to Cr VI by inhalation, skin contact, clothing contamination, or ingestion.
  - + Regulated areas will be sufficiently sized to prevent outside individuals’ potential exposure.
  - + Only individuals who are authorized to enter a regulated area may do so after receiving required training.
  - + Any person that enters the regulated area shall be wearing the appropriate PPE and follow the required hygiene practices.
  - + There shall be no eating, drinking, tobacco use, chewing gum, or applying cosmetics when working in Cr VI regulated areas.

#### HYGIENE PRACTICES, DECONTAMINATION, AND DISPOSAL

- Employee-owners working within regulated areas will be provided an area for decontamination which consists of the following:
  - + Barricading and signage to mark the boundaries of the decontamination area.
  - + A shop vac equipped with a HEPA filter for removal of contaminants on soft items such as clothing, gloves, harnesses, etc.
  - + For hard-type materials such as boots, hard hats, etc. sanitary wipes will be provided to remove contaminants.
  - + Hand wash stations or sanitary wipes will be available to clean exposed skin.
  - + The use of compressed air or any other means of cleaning that may cause airborne contaminants will be prohibited.
- Protective clothing and cleaning materials will be placed in a container with a self-closing lid.
- Contaminated clothing removed for laundering, cleaning, maintenance, or disposal, shall be stored and transported in sealed, impermeable bags or other closed, impermeable containers.
- Containers will be labeled stating the following:
  - + “Warning: Contains Hexavalent Chromium; Potential Lung Carcinogen.”
  - + Laundering services will be notified of the potentially harmful effects of exposure to Cr VI and that the clothing and equipment should be laundered and cleaned in a method that minimizes exposure to skin and eye contact.

#### PERSONAL PROTECTIVE EQUIPMENT (PPE)

- At a minimum, half mask type respirators with P100 filters will be utilized for respiratory protection.
- Respiratory protection use will be in accordance with Safety Guidelines Respiratory Protection Program.
- Appropriate fire retardant (FR) protective clothing shall be provided and worn in regulated areas and if indicated on the Hexavalent Chromium Exposure Assessment Matrix.

#### MEDICAL SURVEILLANCE

- Medical surveillance will be made available at no cost to employee-owners who are potentially exposed to Cr VI.

#### TRAINING

##### Hexavalent Chromium Training Requirements

- Training will be provided to those employee-owners involved in and potentially exposed to Cr VI.