

CADMIUM & HEXAVALENT CHROMIUM MANAGEMENT



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1. INTRODUCTION

- a. The purpose of this program is to establish requirements for the use and handling of materials that expose employees to cadmium and/or hexavalent chromium.

2. RESPONSIBILITIES

a. Managers/Supervisors

- i. Shall ensure that all employees are aware of the proper work procedures for cadmium and hexavalent chromium
- ii. Shall ensure that initial training is conducted for all new employees and that retraining is conducted when employee behaviors suggest that retraining is warranted.
- iii. As part of the JSA and other hazard evaluation processes, identifies and evaluates chromium or cadmium hazards and potential exposures during planning and the conduct of work.
- iv. Reviews and approves the Task-Specific Safety Analysis. As necessary, quantitatively determines the presence of chromium or cadmium in materials, substrates, and other media. This may involve the collection of samples for analysis by a qualified laboratory or field testing using acceptable test methods.
- v. Provides results of any chromium or cadmium survey to management/supervision, along with information regarding hazard potential and control measures. As appropriate, makes recommendations to management/supervision to maintain, modify, upgrade, or downgrade controls accordingly.
- vi. Takes prompt corrective measures (or supports any Competent Person in this role) to eliminate hazards; such as recommending to management/supervision to implement or modify engineering, administrative, work practice, and personal protection (including respiratory protection) controls.
- vii. Conducts periodic exposure assessment.
- viii. As appropriate, assists management/supervision in ensuring that workers have the necessary training and medical surveillance based upon the activity and hazard.
- ix. Ensures that medical monitoring is conducted in accordance with 29 CFR 1926.1126 (for chromium) or 29 CFR 1926.1127 (for cadmium) including imposition of work restrictions where appropriate and reviewing results of medical monitoring.
- x. In evaluating chromium or cadmium hazards and specifying controls for a job, (a) utilizes reliable historical exposure monitoring data generated for other similar

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operations or activities, (b) utilizes objective data, and/or (c) plans and conducts initial monitoring to determine exposures and assess the effectiveness of hazard controls.

- x. Conducts initial and periodic exposure monitoring in accordance with National Institute for Occupational Safety and Health (NIOSH)/OSHA methods if lacking historical or objective data.
- xi. Conducts initial and periodic exposure monitoring in accordance with National Institute for Occupational Safety and Health (NIOSH)/OSHA methods if lacking historical or objective data.
- xii. Maintains effective records of jobs monitored, so that a historical database can be used to specify controls and eliminate unnecessary and redundant monitoring for future activities.
- xiii. Supports project management/supervision in responding to exposures above the PEL when workers were not adequately protected.
- xiv. As appropriate, participates in pre-job and daily worker briefings regarding task-specific chromium or cadmium hazards and controls, work practices/plans (such as JSAs), and other applicable information, including any changes that are made to controls or to the work practices or plans.

b. Employees

- i. Shall follow all requirements regarding the safe work procedures for cadmium and hexavalent chromium.

3. CADMIUM PROCEDURE

- a. A written compliance program shall be implemented when the PEL for cadmium is exceeded at a work site.
- b. The following areas shall be addressed within the site compliance program and to ensure emergency plans are in place should a release of cadmium occur:
 - i. Potential exposure determination including a description of each operation where cadmium is omitted, machinery use, material processed, controls in place, crew size, employee job responsibilities and maintenance practices.
 - ii. Air monitoring data or developing a justification for not conducting monitoring based on previous monitoring/historical data or objective data.
 - iii. Engineering controls including the specific means that will be employed to meet compliance.
 - iv. A report of technology considered in meeting the PEL.
 - v. A detailed schedule of implementation.
 - vi. Consideration of respiratory protection.
 - vii. A documented, written plan for dealing with emergency situations involving a substantial release of cadmium.

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- viii. Work practice program.
- ix. Other relevant information such as protective clothing, housekeeping, hygiene areas and practices (including consideration of shower facilities), consideration of medical surveillance, training and recordkeeping.
- c. The written program must be reviewed and updated annually or more often to reflect significant changes in the compliance status for **H2 Enterprises, LLC**.
- d. The program shall be provided for examination and copying upon request of affected employees, their representatives or OSHA officials.
- e. Maintenance procedures while working on ventilation systems and changing of filters will be established. Procedures shall be developed and implemented to minimize employee exposure to cadmium when maintenance of ventilation systems and changing of filters. Examples include: Proper use of PPE, use of HEPA filtered vacuums, wet sweeping or other methods to minimize the likelihood of exposure to chromium. No compressed air shall be used to remove chromium from any surface. Cleaning equipment must be handled in a manner that minimizes the reentry of chromium into the workplace.
- f. Construction work activities that result in exposure to chromium or cadmium may include, but are not limited to, the following:
 - i. Demolition or salvage of structures where chromium or cadmium, or materials containing chromium or cadmium, are present.
 - ii. Removal or encapsulation of materials containing chromium or cadmium.
 - iii. New construction, alteration, repair, or renovation of structures and substrates that contain chromium or cadmium.
 - iv. Installation of products containing chromium or cadmium.
 - v. Working with/around Portland cement (in powder or dust form – chromium only).
 - vi. Torch-cutting chromium/cadmium containing paints.
 - vii. Transportation, disposal, storage, or containment of chromium or cadmium, or materials containing chromium or cadmium.
 - viii. Maintenance operations associated with construction activities.
 - ix. Welding, cutting, burning, or grinding stainless steel, chromium-/cadmium-containing alloy steel, and chromium/cadmium containing alloys.
Note: Exposure to chromium (especially hexavalent chromium) has also occurred when the welding rod or wire in use contains chromium.
- g. The permissible exposure limit (PEL) for cadmium and hexavalent chromium is five (5) micrograms calculated as an 8-hour time-weighted average over a work shift. The action level (AL) of 2.5 micrograms triggers the following requirements:

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- i. Pre-job planning includes, as needed, a thorough identification of chromium or cadmium materials. Identification may include the product name, a Material Safety Data Sheet (MSDS) with the MSDS number (if available) or a sample content analysis. Sampling data includes location, sampling method, sampling dates, laboratory identification, and analytical method.
- ii. If documentation is not feasible or has been determined by the project engineer to be unavailable or unreliable, chromium or cadmium content sufficient to exceed the action level for chromium or cadmium is assumed.
- h. Results of bulk sampling, calculations of potential chromium or cadmium exposure, and other data that demonstrate compliance with this practice (as well as the pertinent standards) are attached to the work package.
- i. Where chromium or cadmium exposure above the action level is suspected, and in the absence of monitoring data, interim protective measures are established that are equal to or greater than the assumed exposure level.

4. HEXAVALENT CHROMIUM PROCEDURE

a. Welding, Cutting, and Grinding

Certain welding and cutting activities have been shown to expose the welder/cutter, and potentially helpers, to hexavalent chromium above the action level when exhaust ventilation is not used. The activities have included the following:

- i. Shielded metal arc welding, Gas metal arc welding
- ii. Flux cored arc welding, Sub arc welding
- iii. Torch cutting through chromate-containing paints, grinding chromium-containing metals.

The types of metal involved have been stainless steel, chromium-containing alloy steel, and chromium-containing nonferrous alloys. Exposure has also occurred when the welding rod or wire in use contains chromium, and exhaust ventilation is not used.

Therefore, exhaust ventilation is always prescribed as a control measure when activities with the materials mentioned above are in use unless historical personal monitoring data performed when similar materials, using similar methods, under similar environmental conditions are used shows conclusively that the welder/cutter and helper (if applicable) are not exposed above the action level without regard to respiratory protection.

No employee shall be exposed in excess of the PEL of 5 micrograms per cubic meter of air as an 8-hour TWA. Employees shall not be exposed in excess of the permissible exposure level.

b. Plasma and Air Arc Cutting and Gouging

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Plasma and air arc cutting and gouging operations have been shown to expose the worker and helpers within 10 feet of the work to levels of hexavalent chromium above the permissible exposure limit (PEL) under most circumstances and conditions. Exhaust ventilation and respiratory protection (at least a half-face, tight-fitting respirator with a HEPA filter/cartridge) are always prescribed as control measures when activities with the materials mentioned above are in use; a higher level of respiratory protection may be prescribed, depending on conditions.

Note: Each discrete task must begin with ventilation and respiratory protection control measures in place. Respiratory protection may be downgraded only upon conclusive results of breathing zone monitoring of the employee(s) involved in each discrete task showing exposure to be less than 50 percent of the protection factor of the respirator relative to the concentration and PEL of hexavalent chromium. Respiratory protection may be eliminated only upon conclusive results of breathing-zone monitoring of the employee(s) involved in each discrete task showing exposure to be less than the PEL as an 8-hour time-weighted average.

Additional controls may also be appropriate to be in compliance with 29 CFR 1926.1126, depending on the results of evaluations of the materials to be used, environmental conditions, length of the work process/activity, etc.

c. Medical Surveillance

Medical surveillance must be provided to employees who are exposed above the PEL for 30 days or more per year or exposed in an emergency. Medical surveillance shall be provided when an employee experiences signs or symptoms of the adverse health effects of Hexavalent Chromium (dermatitis, asthma, bronchitis, etc.). Medical evaluations will be provided at no cost to employees. Examinations will be performed by or under the supervision of a physician or other licensed health care professional.

d. Hygiene

Personal hygiene is very important while working with chromium or cadmium products. To avoid accidental ingestion of chromium or cadmium, employees wash thoroughly (regardless of other controls) prior to eating, chewing, smoking, or drinking.

5. PRACTICES

- a. **H2** Management/supervision supported by safety professional(s), the medical contractor and training providers conduct the following basic steps to control exposure to chromium or cadmium:
 - i. Determine the types of projects, activities, and operations that could involve chromium or cadmium, or chromium or cadmium-containing materials. For those jobs, conduct hazard identification as part of the work design, planning, and control process.

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- ii. If chromium or cadmium materials are involved, ensure that project safety (for chromium) or a competent person (for cadmium) conducts a hazard evaluation to determine the potential exposure and to recommend initial controls.
- iii. Develop and implement a Task-Specific Safety when exposure is or is likely to be above the PEL. The JSA (or equal) addresses the scope of work activities; provides initial exposure assessment; and prescribes exposure controls, air-monitoring requirements, work practices, personal protective equipment and additional information as required.
- iv. Incorporate recommendations from project safety for chromium or cadmium hazard control measures into any JSA and work control documents.

b. Exposure Monitoring

Periodic monitoring shall be conducted at least every 6 months if initial monitoring shows employee exposure. Air monitoring will be performed at the beginning of each job task. If exposure monitoring results indicate exposure is above the PEL, a written notification must be included with the corrective action being taken to reduce exposure to or below the PEL.

- i. Notify each affected employee, in writing, of the results of monitoring within five (5) working days.
- ii. Air monitoring for chromium or cadmium may be waived provided the following conditions are met:
 - 1. Monitoring has been performed in the last 12 months.
 - 2. Data from historical monitoring originates from work operations that closely resemble the planned work operations.
 - 3. Workplace and environmental conditions (such as indoors or outdoors, temperature, wind speed, ventilation, and space configuration) are similar to those when the monitoring was performed.
 - 4. The processes, types of material, control methods and work practices are similar.
 - 5. Justification for waving initial monitoring shall be included in the Task-Specific Safety Analysis or equal. Employees involved are briefed regarding the existence of such data.

c. Medical Surveillance

- i. Medical surveillance shall be provided when an employee experiences signs or symptoms of the adverse health effects of Hexavalent Chromium (dermatitis, asthma, bronchitis, etc.). Medical evaluations will be provided at no cost to employees. Examinations will be performed by or under the supervision of a physician or other licensed health care professional.

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d. Change Room and Hygiene Facilities

- i. **H2** will provide change rooms for decontamination and ensure facilities prevent cross-contamination. Washing facilities shall be readily accessible for removing chromium from the skin. Workers must wash their hands and face or any other potentially exposed skin before eating, drinking or smoking.

di. Regulated Areas

- i. Regulated areas shall be established when exposure to an employee is or is expected to be in excess of the PEL. Regulated areas shall be marked with warning signs to alert employees and access is restricted to authorized persons only.

dii. Controls

- i. **H2** is responsible for implementing effective engineering and work practice controls if the exposure level is above the permissible limit for more than 30 days per year.
- ii. Engineering and work practice controls should be provided to reduce exposure to the lowest feasible level. If employees can demonstrate that such controls are not feasible, **H2** shall use engineering/work controls to reduce employee exposure to the lowest levels achievable, and shall supplement them by the use of respiratory protection.

diii. Recordkeeping

- i. **H2** will maintain and make available an accurate record of all employee exposure monitoring, medical surveillance and training records upon request.

div. Respiratory Protection & PPE

- i. Respirators must be used when engineering controls and work practices cannot reduce employee exposure, during work operations where engineering controls and work practices are not feasible, and emergencies.
- ii. Respirators shall be provided in accordance with 1910.134 (Respiratory Protection) (see **H2** Respiratory Protection Program). Specific requirements contained within 1926.1127 (Cadmium) regarding respiratory protection.

dv. Housekeeping

- i. Surfaces shall be maintained as free as practicable of accumulation of chromium.
- ii. All spills and releases of chromium shall be cleaned promptly. Methods of cleaning include HEPA filtered vacuums, dry or wet sweeping, shoveling or other methods to minimize exposure.

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- iii. No compressed air shall be used to remove chromium from any surface unless the compressed air is used in conjunction with a ventilation system designed to capture the dust cloud created by the compressed air or no alternative method is feasible.
- iv. Cleaning equipment must be handled in a manner that minimizes the reentry of chromium into the workplace.

6. TRAINING

- a. **H2** shall provide appropriate types of training for employees who are potentially exposed to chromium or cadmium prior to their initial assignment and annually thereafter. **H2** will assure employee participation and maintain a record of the training contents. This training includes:
 - i. Hazard communication training for potentially exposed employees.
 - ii. Chromium hazards, control methods and medical surveillance.
 - iii. Training specified by the applicable chromium or cadmium standard for workers exposed at the action level for any one day, or who are exposed to chromium or cadmium compounds that are skin irritants.
 - iv. Respirator training if respirators are to be used.
 - v. Provide information to workers regarding task-specific chromium or cadmium hazards and control methods, the JSA, work practices, medical surveillance and other applicable information, including any changes that are made to these controls.
 - vi. Provide training annually, as appropriate, to workers who continue to have exposure to chromium or cadmium at or above the action level on any one day.
 - vii. All training will be recorded and include the identity of the employee trained, the signature of the person who conducted the training and the date of the training.
 - viii. Training records must be kept for one year.