



MIOSHA Fact Sheet

Construction Safety & Health Division

Chromium (VI) Exposure in

Construction and General Industry

MIOSHA, effective August 7, 2006, regulates exposure to Hexavalent Chromium [Cr (VI)] under [MIOSHA Part 604, Chromium \(VI\) in Construction](#) and [MIOSHA Part 315, Chromium \(VI\) in General Industry](#). Exposure to other forms of Chromium such as Cr (II), Cr (III), and Chromium metal (as Cr) are addressed under [MIOSHA Part 301, Air Contaminants for General Industry](#) and [MIOSHA Part 601, Air Contaminants for Construction](#).

The focus of this Fact Sheet is Part 604 and Part 315, which address exposure to Cr (VI).

Workers in many different occupations are exposed to Cr (VI). Occupational exposures occur mainly among workers who handle pigments containing dry chromate, spray paints and coatings containing chromate, operate chrome plating baths, and weld or cut metals containing chromium. Stainless steel welding can be associated with construction or maintenance welding and cutting operations in electrical generating power plants, chemical plants, aerospace plants and any operation where stainless steel pipe or other stainless steel materials are used.

Health Hazards:

Calcium chromate, chromium trioxide, lead chromate, strontium chromate, Cr (VI) produced during welding operations, and zinc chromate are known human carcinogens. An increase in incidence of lung cancer has been observed among workers in industries that produce chromate and manufacture pigments containing chromate, and has also been reported among producers and consumers of pigment containing chromate. One study of chromium-nickel alloy foundry workers showed a statistically significant increase in lung cancers. Exposure to welding fume containing Cr (VI) fume is of particular concern because the fume particles produced are very small and can be easily respired into the deep lung. Exposure to chromium can also cause upper respiratory tract and skin irritation.

Employer Requirements:

The MIOSHA Part 604 and Part 315 apply to construction work and general industry work, respectively, where employees may be exposed to Cr (VI). Unless otherwise stated, the following requirements apply to both construction and general industry.

- **Exposure determination** – The employer must determine each employee's 8-hour, time weighted average (TWA) exposure to Cr (VI). Monitoring results must be compared to the Permissible Exposure Limit (PEL) of 5 micrograms per cubic meter of air (5 ug/m³), and the Action Level of 2.5 ug/m³.
- **Regulated area** – In general industry only, the employer must establish a regulated area wherever an employee's exposure is or can be expected to be in excess of the PEL.
- **Methods of compliance** – The employer must reduce employee exposure to Cr (VI) to at or below the PEL by the use of engineering and work practice controls unless the employer can show that such controls are not feasible. Also, if the employer can show that an employee is not exposed to Cr (VI)

above the PEL for more than 30 days a year, then the requirement to implement engineering and work practice controls does not apply.

- **Respiratory Protection** - Respirators must be provided in all cases where employees are exposed above the PEL including: during the period when feasible controls are being implemented, during work operations when such controls are not feasible, where employees are exposed above the PEL fewer than 30 days a year, and during emergencies.
- **Protective work clothing and equipment** - Where a hazard is present or is likely to be present from skin or eye contact with Cr (VI), the employer must provide appropriate personal protective clothing and equipment at no cost to employees, and must ensure that employees use such clothing and equipment. Employees must not remove contaminated clothing from the workplace and the employer is responsible for cleaning and laundering contaminated clothing and equipment.
- **Hygiene areas and practices** – Where protective clothing and equipment is required, the employer must provide change rooms with separate storage facilities for protective clothing and equipment, and street clothes. Washing facilities must also be provided. Certain activities such as eating and smoking are prohibited in the exposure area.
- **Housekeeping** – In general industry only, there are additional requirements for housekeeping. These include maintaining work surfaces as free as practicable from contamination of Cr (VI), and specific clean up and disposal methods for Cr (VI) contaminated surfaces and materials.
- **Medical surveillance** - The employer must make medical surveillance available at no cost to the employee, and at a reasonable time and place, for all employees:
 - Exposed to Cr (VI) at or above the Action Level for 30 or more days a year,
 - Experiencing signs or symptoms of the adverse health effects associated with Cr (VI) exposure, or
 - Exposed in an emergency.
- **Communication of hazards** – Employees must be trained in accordance with the MIOSHA Right to Know/Hazard Communication rules, Part 430 in construction and Part 92 in general industry. The Cr (VI) rules have additional training requirements.
- **Record keeping** – The employer must maintain records of air monitoring data, historical and objective-monitoring data, and records pertaining to the employers medical surveillance program.

How to Avoid Hazards:

The best way to prevent over-exposure to Cr (VI) is to install and maintain engineering or other controls to eliminate or reduce the hazard. Examples of engineering and other controls include:

- Consult Material Safety Data Sheets and/or other information to determine if chromium is present in materials with which employees will work.
- Eliminate chromium-containing materials when possible.
- Conduct bulk material analysis to determine if chromium is present.
- Use exhaust ventilation and dust/fume collection systems. Power tools used for grinding surfaces coated with chromium-containing material can be equipped with dust collection systems. Local exhaust ventilation, where feasible, is an effective way to capture Cr (VI) containing welding fume.
- Do not dry sweep or use compressed air to clean work areas contaminated with chromium materials; use wet methods or a vacuum equipped with a high efficiency particulate (HEPA) filter.
- Provide respiratory protection, protective work clothing and equipment, housekeeping, hygiene facilities, medical surveillance, and training, in accordance with the rules.
- Provide respiratory protection when engineering and work practice controls cannot be used or do not reduce exposure to an acceptable level. The type of respiratory protection required is based on the level of exposure determined by air monitoring. Where respirators are necessary, the employer must implement a respiratory protection program as required by MIOSHA Part 451, Respiratory Protection.

- Establish a regulated area in construction operations where respirators are used to prevent unprotected employees from entering the exposure area. Remember, a regulated area is required under the general industry rules.

For additional information regarding the hazards of Cr (VI), please contact the Construction Safety and Health Division at 517-322-1856, the General Industry Safety & Health Division at 517-322-1831, or the Consultation Education and Training Division at 517-322-1809. Construction and General Industry Standards can be viewed on the MIOSHA website at www.michigan.gov/miosha/standards. The OSHA **Small Entity Guide for the Hexavalent Chromium Standards** can be viewed on the OSHA website at: www.osha.gov.

DELEG is an equal opportunity employer/program.
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