



MIOSHA Fact Sheet

General Industry Safety & Health Division

Chromium VI

What is chromium VI (hexavalent chromium, hex-chrome, or Cr VI)?

Chromium (Cr) is a naturally occurring metal element with a wide variety of uses including steel alloying, pigments, and plating. Chromium exists in several different forms, including chromium metal, chromium III, and chromium VI. Chromium VI is found in chemical and industrial processes. Chromic acid (CrO_3), chromates (zinc chromate, lead chromate), and dichromates (potassium dichromate, sodium dichromate) all contain chromium VI. Chromium metal found in chrome plated parts, stainless steel, and other metal alloys is not chromium VI. However, it can be generated when welding on stainless steel and other metals alloyed with chromium.

How can chromium VI affect the body?

Inhaling chromium VI as a dust, mist, or fume is known to cause lung cancer and irritation or damage to the nose and throat. Inhalation can also cause an allergic reaction that can result in occupational asthma (wheezing and shortness of breath). As a group, chromium VI compounds are irritants and corrosive. Therefore, contact with the skin and eyes can cause irritation and damage due to a chemical burn. Skin irritation can also result from an allergic skin reaction.

Where can exposure to chromium VI occur?

Employees can inhale or contact chromium VI when:

- Using chromate pigments and powders; chromium catalysts, dyes, and coatings;
- Working near chrome electroplating tanks that use chromic acid;

- Welding on stainless steel, chrome alloys, or chrome-coated metal; or
- Applying and removing chromate-containing paints.

Is employee exposure to chromium VI regulated?

[Part 315, Chromium \(VI\) in General Industry](#) is the MIOSHA standard that regulates employee exposure and requirements in General Industry. This standard includes the following requirements:

- Perform **initial air monitoring** to determine employee exposure. The “action level” (AL) is 0.0025 milligrams of chromium per cubic meter of air (mg/m^3) and the “permissible exposure limit” (PEL) is 0.005 mg/m^3 . Both of these exposure limits are based on an employee’s average exposure for an eight-hour work day. Relative to other exposure limits these limits are very low.
- Perform **periodic air monitoring**, at least every six months, when initial monitoring shows employee exposure at or above the action level.
- When the PEL is exceeded, establish a regulated area and limit access to authorized personnel (people who have to work or be present in the area).
- Use appropriate **engineering or work practice controls** to reduce employee exposure below the PEL. This can include local exhaust ventilation; limiting an operation to a particular area (enclosed room or booth); having prescribed methods of performing the job; or using wet methods to minimize dust.
- Provide **respiratory protection** in accordance with the standard. Respiratory protection cannot substituted for appropriate engineering or work practice controls. Respiratory protection is required when the PEL is exceeded and must be provided in accordance with

MIOSHA [Part 451, Respiratory Protection](#). The respiratory protection standard applies when employers allow or require the use of respirators.

- Provide **personal protective clothing or equipment** when there is likely to be a hazard present from skin or eye contact. Ensure contaminated clothing and equipment is removed at the workplace, properly stored, cleaned, and replaced. Employees cannot take contaminated items from the workplace.
- Implement good **personal hygiene practices** and provide for change rooms, washing facilities, and eating and drinking areas as required by the standard.
- **Maintain all surfaces** as free as practicable of chromium VI by using HEPA-filtered vacuuming or wet cleaning methods. For the most part, it is unacceptable to use compressed air or dry sweeping methods to clean surfaces.
- **Medical surveillance** is required:
 - When the action level is exceeded for 30 or more days per year; or
 - An employee has signs or symptoms of adverse health effects that are associated with chromium VI exposure; or

- When exposure occurs in an emergency situation; and
- At the termination of employment.
- In addition to all requirements of [Part 430, Hazard Communication](#), employees must be provided with **information and training**. Each employee must be able to demonstrate knowledge of:
 - The contents of the chromium VI standard;
 - The purpose and description of the medical surveillance program; and
 - The standard must be readily available to all affected employees.
- **Records** must be kept of all air monitoring and any objective data relied upon to meet the standard's requirements such as materials, operations, processes, etc. Employee medical surveillance records must be maintained for 30 years.

Additional Information

Please visit the MIOSHA website at www.michigan.gov/mioshapublications where additional information may be available; or contact the Consultation, Education & Training Division at (517) 322-1809.

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