

## What personal protective equipment products are available to help protect me from the risks of exposure to Hexavalent Chromium?

### Respiratory Protection –

Where employee's 8 hour weighted average exposure to Cr(VI) is above the PEL of 5ug/m<sup>3</sup> and cannot be reduced through engineering or administrative controls, employers shall provide respiratory protection for their workers. 3M, a leading manufacturer of respiratory protection, offers the following products which can be used for Cr(VI) exposures:

- N95 filters may be used where no oil aerosols are present
- R or P95 filters may be used where oil aerosols are present (refer to packaging for time use limitations)
- Filtering facepiece respirators and half facepiece respirators with appropriate filters may be used up to 10 X PEL of 5ug/m<sup>3</sup> when qualitatively or quantitatively fit tested
- Full facepiece respirators with appropriate filters may be used up to 10 X PEL of 5ug/m<sup>3</sup> when qualitatively fit tested and may be used to 50 X PEL of 5ug/m<sup>3</sup> when quantitatively fit tested
- Loose fitting facepieces may be used to 25 X PEL of 5ug/m<sup>3</sup>
- Tight fitting facepieces, hoods and helmets with supplied air or powered air purifying respirators may be used up to 1000 X PEL of 5ug/m<sup>3</sup>

Consult your Airgas Safety Specialist for assistance in selecting the proper respiratory protection for your application.



### Protective Work Clothing and Equipment –

Where hazards are present or likely to be present from skin or eye contact with Cr(VI), the employer shall provide appropriate personal protective clothing and equipment. Appropriate personal protective equipment typically includes, but is not limited to, the following: Hand protection, eye, face and head protection, protective clothing, footwear, hand soaps and eyewash stations. Consult your Airgas Safety Specialist for assistance in selecting the right personal protective equipment products for your application.

### What about other products I might need to comply?

**Sampling Pumps** – Worksites shall be monitored to determine the Cr(VI) exposure in your facility.

**LINCOLN ELECTRIC Fume Extractors** – Where Cr(VI) exposures are above the PEL, determine if fume extractors can help reduce the exposure to below the PEL.



Consult with your Airgas Safety Specialist and/or an AIHA accredited laboratory for assistance in the selection of the appropriate sampling methods and engineering control alternatives.



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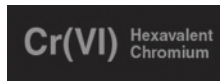
# HEXAVALENT CHROMIUM Cr(VI)

**Protect yourself and your workers from the risks of exposure**



The Occupational Safety and Health Administration's (OSHA) final Hexavalent Chromium Cr(VI) Standard states the new permissible exposure limit (PEL) for Cr(VI) is 5ug/m<sup>3</sup> (micrograms per cubic meter) as an eight-hour time-weighted average (TWA). There are three standards for different industries — General Industry, Construction and Shipyards. The respiratory protection requirements for the three standards are similar. They all require the respiratory protection program, including respirator selection to be in compliance with OSHA 1910.134. For a complete copy of the standard please refer to OSHA's website at [www.osha.gov](http://www.osha.gov). Find out about the respiratory and contact dangers of Hexavalent Chromium and how to stay protected from them.

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# Hexavalent Chromium

## What is Hexavalent Chromium?

Hexavalent chromium is a metal particle that can occur naturally in rocks but is most commonly produced by industrial processes like welding, chrome plating and similar operations. Technically speaking, an oxidizer (like hexavalent chromium) can only gain electrons from other elements.

## Where it is found?

Chromium hexavalent Cr(VI) compounds, often called hexavalent chromium, exist in several forms. One is in chromates, which are often used as pigments for photography, as well as in pyrotechnics, dyes, paints, inks, and plastics. They're also found in stainless steel, textile dyes, wood preservatives, leather tanning products, anti-corrosion coatings, and in cement.

## How does exposure occur?

The primary means of human exposure to hexavalent chromium and chromate salts are inhalation, ingestion and skin contact. Hexavalent chromium can be inhaled when hexavalent chromium dust, mist, or fumes are in the air. Operations include the production of chromate pigments and powders, chromic acid, chromium catalysts, dyes and coatings. Employees who are working near chrome electroplating; those who are welding and hotworking stainless steel, high chrome alloys and chrome-coated metal; applying and removing chromate-containing paints and other surface coatings are affected as well. Airborne particles of chromium dust can also contaminate hands, clothing, beards, food, and beverages. Health effects include lung cancer in workers who breathe airborne hexavalent chromium, irritation or damage to the nose, throat, and lungs (if hexavalent chromium is breathed at high levels), and irritation or damage to the eyes and skin (if hexavalent chromium contacts these organs in high concentrations).

## What are the main industries which are affected by Cr(VI)?

According to OSHA, the main industries affected, but are not exclusive, are stainless steel fabrication, manufacturers of heavy-duty coatings and paints, electroplating operations and producers of chrome-based pigments.

## How does hexavalent chromium affect me physically?

Breathing in high levels of hexavalent chromium can cause irritation to the nose and throat. Symptoms may include runny nose, sneezing, coughing, itching and a burning sensation. Repeated or prolonged exposure can cause sores to develop in the nose and result in nosebleeds. If the damage is severe, the nasal



septum (wall separating the nasal passages) can develop a hole (perforate). Breathing small amounts of hexavalent chromium even for long periods does not cause respiratory tract irritation in most people. Some people become allergic to hexavalent chromium so that inhaling chromate compounds can cause asthma symptoms such as wheezing and shortness of breath. Some people can also develop an allergic skin reaction, called allergic contact dermatitis. This occurs from handling liquids or solids containing hexavalent chromium. Once a person becomes allergic, brief skin contact causes swelling and a red, itchy rash that becomes crusty and thickened with prolonged exposure. Allergic contact dermatitis is long-lasting and more severe with repeated skin contact. Direct skin contact with hexavalent chromium can cause a non-allergic skin irritation. Contact with non-intact skin can also lead to chrome ulcers. These are small, crusted skin sores with a rounded border. They heal slowly and leave scars.

## What's the timeline for compliance?

The standard went into effect on May 30, 2006. Employers with 20 or more employees (all employees; not just welders) should have already complied by November 27, 2006. Employers with 19 or less employees must comply by May 30, 2007. Engineering controls to reduce the exposure must be put into place by May 31, 2010.

## What applications are most affected by the standard?

Stainless steel welding operations are affected the most by the standard. Spraying heavy-duty coatings and paints (trains, airplanes, automobiles, boats and ships), and chrome plating are also affected by the new standard.

## How does this impact me?

Employers must reassess their respirator program taking into consideration the lower exposure limit. More employers may have to provide respiratory protection to employees and assess the feasibility of engineering controls (such as ventilation). If they have not done so already, employers in the affected industries should make an exposure determination to establish whether or not the new standard and its requirements apply and, if so, implement the necessary steps for compliance, including selection of proper respirators.

## What steps does OSHA require for employers to comply?

- Limit eight-hour time-weighted average hexavalent chromium exposure in the workplace to 5 micrograms or less per cubic meter of air.
- Perform periodic monitoring at least every 6 months if initial monitoring shows employee exposure at or above the action level (2.5 micrograms per cubic meter of air calculated as an 8-hour time-weighted average).
- Provide appropriate personal protective clothing and equipment when there is likely to be a hazard present for skin or eye contact.
- Implement good personal hygiene and housekeeping practices to prevent hexavalent chromium exposure.
- Prohibit employee rotation as a method to achieve compliance with permissible exposure limit (PEL).

- Provide respiratory protection as specified in the standard.
- Make available medical examinations to employees within 30 days of initial assignment; annually; to those exposed in an emergency situation; to those who experience signs or symptoms of adverse health effects associated with hexavalent chromium exposure; to those who are or may be exposed at or above the action level for 30 or more days a year; and at termination of employment.



## Who should do the exposure determination testing?

There are a few options when it comes to performing the test. Anyone can perform the testing as long as the testing is done by the procedures in the OSHA standard. The equipment can be purchased for testing by the employer. An industrial hygienist can be hired to perform the testing for the employer. Or the employer can call their insurance company and get a recommendation from them as to the correct action to take. Many insurance companies will hire an industrial hygienist to perform the testing and send the samples to an accredited lab for a nominal fee. This is the recommended course of action throughout the field for many shops. The employer will need to check with their insurance company to verify that they are capable and willing to perform this function.

**For additional information on Hexavalent Chromium and how it effects you, check out these web sites:**



### OSHA- Safety and Health Topics: Hexavalent Chromium

<http://www.osha.gov/SLTC/hexavalentchromium/index.html>



### Highlights of the New Hexavalent Chromium Standard-3M

<http://multimedia.mmm.com/mws/mediawebsvr.dyn?6666660Zjcf6IVs6EVs66ScY1COrrrQ->



### Hexavalent Chromium Awareness

<http://www.hexchrome.com>

