



Safety Matters

FACT PACK

Sheet Metal Occupational Health Institute Trust

Hexavalent Chromium

The following information is presented courtesy of the 3M Occupational Health and Environmental Safety Division (OH & ESD), and was adapted to promote the SMOHIT Total Wellness Program.

What is hexavalent chromium?

Hexavalent chromium Cr(VI) is a metal particle that typically is created by industrial process but can also develop naturally in rocks. It is a strong oxidizer, meaning that it can react easily with other elements, and because of this hexavalent chromium has the ability to produce hard coatings. It's a common ingredient in paints for automobiles, boats, and aircraft for this reason, but this fact also accounts for why hexavalent chromium is considered to be a health hazard, too.

What is OSHA's Hexavalent Chromium Cr(VI) Standard?

In early 2006, the Occupational Safety and Health Administration (OSHA) released what is called the final "Hexavalent Chromium Cr(VI) Standard." The new standard set the permissible exposure limit (PEL) for hexavalent chromium at 5 µg/m³ (micrograms per cubic meter) as an eight-hour, time-weighted average (TWA). The respiratory protection requirements for different industries (general industry, construction, and shipyards) are similar. The standard mandates that all respiratory protection requirements, including respirator choice, to follow OSHA 1910.134 requirements; for a complete copy of the Hexavalent Chromium Cr(VI) Standard, visit the OSHA website at www.osha.gov.

What are the primary industries and applications affected?

According to OSHA, the central industries most affected by the standard are those involving stainless steel fabrication; heavy-duty coatings and paints for automobiles, planes, trains, and boats; electroplating; and chrome-based pigment producers. Primary applications affected include welding (specifically on stainless steel surfaces), spraying heavy-duty coatings and paints, and chrome plating.

- i** [Click here](#) to read OSHA's Small Entity Compliance Guide for the Hexavalent Chromium Standards.
- i** [Click here](#) for Hexavalent Chromium Air Monitoring Variables Checklist.
- i** [Click here](#) to read SMACNA's fact sheet on the major provisions of the final standards for occupational exposure to hexavalent chromium.

Which types of Cr(VI) exposure are covered by the standard?

The OSHA standard covers exposures from any source with the exception of the following:

1. Portland cement.
2. Application of regulated pesticides.
3. All cases where an employer has objective data showing that a material, process, operation, or activity involving chromium will not release dusts, fumes, or mists of chromium (VI) in concentrations at or above 5 µg/m³ as an eight-hour TWA under normal conditions of use.

When does the standard take effect?

The PEL, respiratory protection, and engineering controls take effect on these dates:

- Employers with more than 20 employees: November 27, 2006
- Employers with fewer than 20 employees: May 30, 2007
- Feasible engineering controls must be in place: May 31, 2010

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How will the standards affect sheet metal workers?

First and foremost, employers, foremen, and supervisors need to take a fresh look at their respirator programs in light of the lower exposure limit. Certain employers might have to provide respiratory protection to sheet metal workers and determine the feasibility of engineering controls including ventilation. If they have not done so already, sheet metal work employers need to make an exposure determination to establish whether or not the new OSHA standard and its requirements apply and, if so, put into place the necessary compliance measures.

How do I check for exposure sources in the workplace?

The Hexavalent Chromium Cr(VI) Standard allows exposure determinations to be performed either through monitoring or by estimating exposures utilizing and combination of air sampling, historical monitoring data, and objective data. If historical or objective data are used, it must reflect workplace conditions closely mirroring the processes, material types, control methods, work practices, and environmental conditions in the customer's current operations.

What is the best way to check for the presence of Cr(VI)?

You should use a sampling pump and filter in order to monitor for hexavalent chromium for an eight-hour TWA, referring to NIOSH Methods 7604 (by ion chromatography) and 7600 (by visible absorption spectrophotometry) or OSHA Method ID-215 as noted in the Hexavalent Chromium Cr(VI) Standard. Also be certain to check with an American Industrial Hygiene Association (AIHA) accredited laboratory for assistance in choosing the right sampling and analytical method for you. To contact an AIHA lab or an industrial hygienist, visit AIHA's home page at www.aiha.org, and select "Consultants" or "Laboratories."

When is respirator use necessary?

Initially, all employers should attempt to achieve permissible exposure limits through engineering and work practice controls. If this is not possible, respirator use is a must in cases where exposure levels exceed the PEL, including: a. While engineering and work practice controls are being developed; b. During maintenance and repair activities for which engineering and work practice controls are not possible; c. When all possible engineering and work practice controls are in place and are still not capable of reducing exposure levels to or below the PEL; d. When sheet metal workers are



exposed above the PEL for fewer than 30 days per year and the employer has not chosen to put in engineering and work practice controls; and e. Any emergency situation.

Which respirator is right for sheet metal work?

Sheet metal workers should choose their respirator type based on their workplace conditions and contaminant levels:

1. N95 filters may be used where no oil aerosols are present;
2. R or P95 filters may be used where oil aerosols are present;
3. Filtering facepiece respirators, elastomeric half-facepiece respirators, and full-facepiece respirators, when qualitatively fit-tested, may be used up to $10 \times$ PEL with appropriate filters;
4. Full-facepiece respirators may be used up to $50 \times$ PEL when they are quantitatively fit-tested and are equipped with appropriate filters;
5. Loose-fitting facepieces may be used up to $25 \times$ PEL; and
6. Tight-fitting full facepieces, hoods, and helmets with supplied air or powered-air purifying respirators may be used up to $1,000 \times$ PEL.

An employer's initial compliance measures for the standard should include:

1. Read and understand the new standards in their entirety.
2. Complete an initial exposure assessment.
3. Acquire all necessary protective work clothing and equipment.
4. Make certain to comply with other provisions of the standard as required.