

# OSHA's new hexavalent chromium standard

## What it means to you and your employees

By Shannon DeCamp

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Changes are necessary to make sure your welding operation is compliant with OSHA's new permissible exposure limit for hexavalent chromium.

On Feb. 28 the Occupational Safety and Health Administration (OSHA) amended the existing standard that limits occupational exposure to hexavalent chromium [Cr(VI)].

This new rule significantly reduces the permissible exposure limit (PEL) from 52 to 5 micrograms of Cr (VI) per cubic meter of air as an eight-hour time-weighted average (TWA). OSHA has determined that the previous PEL for Cr(VI) posed a significant risk to workers' health. OSHA believes this lower PEL is necessary to reduce the significant health risks of occupational exposure to Cr(VI).

### What Is Hexavalent Chromium?

Hexavalent chromium is prevalent in the metal fabricating industry. Cr(VI) compounds are used most commonly as a structural and anticorrosive element in stainless steel, iron, and steel production and in welding and painting.

Occupational exposures to Cr(VI) can occur from inhaling its mist (such as from chrome plating), dusts [including inorganic pigments or Cr(VI)-painted surfaces], or fumes (as in stainless steel welding) and from dermal contact. Exposure to Cr (VI) has been linked conclusively to lung cancer, asthma, nasal ulcerations and perforations, skin ulcerations (or chrome holes), and allergic and irritant contact dermatitis.

### How the New Standard Affects the Metal Fabricating Industry, Your Company

While multiple industries are affected by this ruling, welding applications account for the largest number of businesses and employees affected. Welding occurs in more than 40,000 establishments in the U.S. Welders work on a variety of base metals using different welding methods. These can vary in the course of a project or even during a single work shift. Because of these factors, welding is not separated easily into high- and low-exposure operations.

This focus on hexavalent chromium likely means that OSHA will focus on metal fabricating compliance in general. That makes this a good time to reconfirm that all aspects of your business are compliant.

Specifically relating to this standard, employers must:

1. Monitor employee exposure.
2. Establish regulated areas where exposures may reasonably be expected to exceed the PEL.
3. Implement engineering and work practice controls to reduce employee exposures to Cr (VI).
4. Provide respiratory protection where engineering and work practice controls are not feasible or are insufficient to meet the PELs.
5. Provide other protective clothing and equipment as necessary for dermal protection.
6. Establish housekeeping procedures and provide industrial hygiene facilities (hand washing stations).
7. Provide medical surveillance when employees are exposed above the PEL.
8. Train workers about Cr(VI) hazards (including elements already required by OSHA's Hazard Communication Standard).
9. Keep records related to the standard.



*Photo courtesy of 3M Occupational Health & Environmental Safety Division, St. Paul, Minn.*

**Exposure Determination.** Each employer covered by this standard must determine the eight-hour TWA exposure for each employee exposed to Cr(VI). OSHA allows employers to choose between a scheduled monitoring option and a performance-based option for making exposure determinations when there is the potential for exposure to hexavalent chromium at or above the action level.

The **action level** is set at one-half of the PEL, or 2.5 micrograms per cubic meter of air calculated as an eight-hour TWA. Because employee exposures to airborne concentrations of Cr(VI) are variable, workers may sometimes be exposed above the PEL even if exposure samples (which are not conducted on a daily basis) generally are below the PEL. Maintaining exposures below the action level provides increased assurance that employees will not be exposed to Cr(VI) at levels above the PEL because of exposure variations in the workplace.

**Regulated Areas.** The employer must establish a regulated area wherever an employee's exposure to airborne concentrations of Cr(VI), or can reasonably be expected to be, is in excess of the PEL. The employer must ensure that regulated areas are demarcated from the rest of the workplace in a manner that adequately establishes and alerts employees of the boundaries of the regulated area.

**Methods of Compliance.** Employers must use engineering and work practice controls to achieve the proposed PEL, or the lowest levels feasibly achievable. This could include ventilation systems, materials substitution, or work practice modifications. Wherever feasible engineering and work practice controls are not sufficient to reduce employee exposure to or below the PEL, the employer must provide respiratory protection. Rotating employees to different jobs to achieve compliance with the PEL is prohibited.

**Respiratory Protection.** The employer must provide respiratory protection for employees during:

- Periods necessary to install or implement feasible engineering and work practice controls.
- Work operations, such as maintenance and repair activities, for which engineering and work practice controls are not feasible.
- Work operations where controls are not sufficient to reduce exposures to or below the PEL.
- Work operations where employees are exposed above the PEL for fewer than 30 days per year, and the employer has elected not to implement engineering and work practice controls to achieve the PEL.
- 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 it must ensure that employees use such clothing and equipment. In addition, a stringent program must be developed for removing, handling, and cleaning contaminated clothing and equipment.

**Housekeeping and Hygiene.** All surfaces must be maintained free of accumulations of Cr(VI), and all spills and releases of Cr(VI)-containing material must be cleaned up promptly. Dry shoveling, sweeping, and brushing may be used only when HEPA-filtered vacuuming or other methods that minimize the likelihood of exposure to Cr(VI) have been tried and found ineffective. Effective wet shoveling, sweeping, and brushing are allowed.

OSHA also allows the use of compressed air to remove Cr(VI) when no alternative method is feasible, but only when used with a ventilation system designed to capture the dust cloud created by the compressed air. Waste, scrap, debris, and any other materials contaminated with Cr(VI) and consigned for disposal must be collected and disposed of in labeled, sealed, impermeable bags or containers. Employers must provide washing facilities in areas where skin contact with Cr(VI) can occur and ensure that employees use them as needed.

**Medical Surveillance.** Medical surveillance is required for employees experiencing signs or symptoms of the adverse health effects associated with Cr(VI) exposure or those exposed in an emergency. "Emergency" means any unexpected and significant release of Cr(VI), such as equipment failure, rupture of containers, and failure to control equipment. Employers must make medical surveillance available at no cost to the employee, and at a reasonable time and place for all employees who are:

- Occupationally 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.
- Exposed in an emergency.

**Hazard Training and Communication.** The signs, labels, and training used for a hazard communication program also apply to this standard. The only additional training required is related specifically to the contents of this Cr(VI) standard. Employers must ensure that each employee can demonstrate knowledge of the contents of this standard, and the purpose and a description of the medical surveillance program required by this standard. In addition, employers must provide a copy of this standard to all affected employees.

**Recordkeeping.** In keeping with its intent to be consistent with the Hazard Communication Standard, OSHA has provisions for exposure records to be maintained, including:

- All data related to air monitoring: date of measurement; the operation involving exposure to Cr(VI) being monitored; sampling and analytical methods used and evidence of their accuracy; and the number, duration, and the results of samples taken.
- The type of personal protective equipment worn (such as respirators).
- The name, Social Security number, and job classification of all employees represented by the monitoring, indicating which employees actually were monitored.
- An accurate record of all objective data relied upon to comply with the requirements of the standard, including the chromium-containing material in question; the source of the objective data; the testing protocol and results of testing or analysis of the material for the release of Cr(VI); a description of the process, operation, or activity and how the data support the determination; and other data relevant to the process, operation, activity, material, or employee exposures.
- An accurate record for each employee covered by medical surveillance under this standard, including the physician's written opinions.

When Is the New Standard Effective?

OSHA believes that it's appropriate to allow time for employers, particularly small employers, to meet the requirements of the final rule. To this end:

- The effective date for the final rule is 90 days after publication (May 30, 2006).
- The start-up date for all provisions except engineering controls is 180 days after the effective date for employers with 20 or more employees (Nov. 27, 2006).
- The start-up date for all provisions except engineering controls is one year after the effective date for employers with 19 or fewer employees (May 30, 2007).
- The start-up date for engineering controls is four years after the effective date for all employers (May 31, 2010).

## The news behind the standard

By Stephanie Vaughan, Associate Editor

Although the new OSHA standard is meant to be an improvement over previous PELs for hexavalent chromium, not everyone feels that this new limit is strict enough.

The old standard was 52 micrograms per cubic meter of air; the latest standard reduces the PEL to 5 micrograms. The original recommendation, however, was to change the exposure limit to 1 microgram per cubic meter of air.

In a statement, Dr. Peter Lurie, deputy director of Washington, D.C.-based Public Citizen's Health Research Group, a nonprofit consumer advocacy organization, said that the new standard is inadequate. The group, which plans to sue OSHA over the ruling, has urged OSHA to restrict the level to 0.25 microgram per cubic meter.

"Hundreds of extra lung cancer deaths will occur if the weak OSHA-proposed standard is allowed to stand," Lurie said in the statement. "Additionally, the great majority of chromium-exposed workers work at sites that are already in compliance with the new proposed standard. ... the agency has failed to set a limit that eliminates significant health risks to the maximum extent technologically and economically feasible in each affected industry, as required by law."

The United Steelworkers union also is displeased by the ruling.

"OSHA's decision guarantees that many more workers will get lung cancer," said Michael Wright, the union's director of health, safety, and environment.

OSHA feels otherwise, according to Jonathan L. Snare, acting assistant secretary for occupational safety and health at OSHA.

"Our new standard protects workers to the extent feasible, while providing employers, especially small employers, adequate time to transition to the new requirements," Snare said in a statement.

Snare admitted in a news report, however, that OSHA understands and acknowledges that there is remaining significant risk with the new PEL.

In related news, a study published in Environmental Health reported that the chromium industry withheld and manipulated key study data supporting a strict standard for workplace exposure to hexavalent chromium.

According to the study, the chromium industry did not notify OSHA of a study it conducted in 2002 on the health effects of lower exposures to hexavalent chromium. In addition, the report accuses industry-funded researchers of manipulating data to obscure the evidence that hexavalent chromium was carcinogenic at lower exposures.

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