



## Chromium (VI), (Hexavalent Chromium)

OSHA has determined that workers exposed to chromium (VI) are at increased risk of developing lung cancer. Occupational exposure may also result in asthma and damage to the nasal passages and skin. Chromium (III), on the other hand, is an essential nutrient that plays a role in glucose, fat, and protein metabolism.

### Uses

Chromium is used by the metallurgical industry to produce stainless steel, alloy steel and non-ferrous alloys. Chromium is alloyed with other metals and plated on metal and plastic substrates to improve corrosion resistance and provide protective coatings for automotive and equipment accessories. Welders use stainless steel welding rods when joining metal parts. Chromium (VI) compounds are widely used in the chemical industry in pigments, metal plating, and chemical synthesis as ingredients and catalysts. Chromates are used as high-quality pigments for textile dyes, paints, inks, glass, and plastics. It is often present in port- land cement as an impurity.

### OSHA Standard

Sections 1910.1026, 1926.1126 and 1915.1026 regulate exposure to chromium (VI) for general industry, construction and shipyards respectively. California is expected to adopt the federal regulations with minimal if any changes.

The standard applies to occupational exposures to chromium (VI) in all forms and compounds except exposures that occur in the application of pesticides regulated by the Environmental Protection Agency or other Federal government agency (for example, the treatment of wood with preservatives); exposures to portland cement; or where the employer has objective data demonstrating that a material containing chromium or a specific process, operation, or activity involving chromium cannot release dusts, fumes, or mists of chromium (VI) in concentrations at or above  $0.5 \mu\text{g}/\text{m}^3$  as an 8 hour time weighted average (TWA) under any expected conditions of use.

Objective data means information such as air monitoring data from industry-wide surveys or calculations based on the composition or chemical and physical properties of a substance demonstrating the employee exposure to chromium (VI) associated with a particular product or material or a specific process, operation, or activity. The data must reflect workplace conditions closely resembling the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

### Exposure Limits

The permissible exposure limit (PEL) is  $5 \mu\text{g}$  per cubic meter. The action level is  $2.5 \mu\text{g}$  per cubic meter. There are two methods approved for determining exposure: scheduled monitoring and performance oriented.

### Scheduled monitoring option

The employer shall perform initial monitoring to determine the 8-hour TWA exposure for each employee on the basis of a sufficient number of personal breathing zone air samples to accurately characterize full shift exposure on each shift, for each job classification, in each work area. Where an employer does representative sampling instead of sampling all employees in order to meet this requirement, the employer shall sample the employee(s) expected to have the highest chromium (VI) exposures.

\*\* If initial monitoring indicates that employee exposures are below the action level, the employer may discontinue monitoring for those employees whose exposures are represented by such monitoring.



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\*\* If monitoring reveals employee exposures to be at or above the action level, the employer shall perform periodic monitoring at least every six months.

\*\* If monitoring reveals employee exposures to be above the PEL, the employer shall perform periodic monitoring at least every three months.

\*\* If periodic monitoring indicates that employee exposures are below the action level, and the result is confirmed by the result of another monitoring taken at least seven days later, the employer may discontinue the monitoring for those employees whose exposures are represented by such monitoring.

The employer shall perform additional monitoring when there has been any change in the production process, raw materials, equipment, personnel, work practices, or control methods that may result in new or additional exposures to chromium (VI), or when the employer has any reason to believe that new or additional exposures have occurred.

### Performance-oriented option:

The employer shall determine the 8-hour TWA exposure for each employee based on any combination of air monitoring data, historical monitoring data, or objective data sufficient to accurately characterize employee exposure to chromium (VI).

### Notification

As soon as possible, but not more than 5 working days, after making an exposure determination following prescribed procedures, an employer must post the results in an appropriate location accessible to all affected employees or notify each employee in writing. The notification has to include the corrective measures that will be used to reduce the exposure below the PEL.

### Methods of Compliance

Engineering and work practice controls are to be used to reduce exposure to or below the PEL unless the employer can demonstrate that such controls are not feasible. If engineering and work practice controls are not feasible, they shall be used to reduce the exposure to the lowest levels achievable and supplemented using respiratory protection. Respiratory protection can be used until engineering and work practice controls are in place, during maintenance and repair activities if engineering and work practice controls are not feasible, when engineering and work practice controls are not sufficient to reduce exposures below the PEL, during emergencies, and when exposures above the PEL are fewer than 30 days per year. The year is defined as 12 consecutive months rather than a calendar year.

\*\* NOTE: Job rotation as a method of achieving compliance with the PEL is prohibited.

Personal protective equipment and clothing shall be provided at no cost to the employee. The employer is responsible for cleaning, laundering, repairing, and replacing personal protective equipment and clothing. Employees are to be prohibited from removing personal protective equipment or clothing from the workplace. Bags and containers of contaminated equipment and clothing need to be labeled according to the hazard communication standard. The employer needs to provide change rooms, washing facilities and ensure that employees who have skin contact with chromium (VI) wash their hands and faces at the end of the work shift and prior to eating, drinking, smoking, chewing tobacco or gum, applying cosmetics, or using the toilet.

### Medical Surveillance



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The employer shall make medical surveillance available at no cost to the employee, and at a reasonable time and place, for all employees:

- (A) Who are or may be occupationally exposed to chromium (VI) at or above the action level for 30 or more days a year;
- (B) Experiencing signs or symptoms of the adverse health effects associated with chromium (VI) exposure; or
- (C) Exposed in an emergency.

### Frequency of Medical Exams

The employer shall provide a medical examination:

- Within 30 days after initial assignment, unless the employee has received a chromium (VI) related medical examination that meets the requirements within the last twelve months;
- Annually;
- Within 30 days after a written medical opinion recommending an additional examination;
- Whenever an employee shows signs or symptoms of the adverse health effects associated with chromium (VI) exposure;
- Within 30 days after exposure during an emergency which results in an uncontrolled release of chromium (VI); or
- At the termination of employment, unless the last examination was less than six months prior to the date of termination.

Contents of examination - A medical examination consists of:

- A medical and work history, with emphasis on past, present, and anticipated future exposure to chromium (VI); any history of respiratory system dysfunction; any history of asthma, dermatitis, skin ulceration, or nasal septum perforation; and smoking status and history;
- A physical examination of the skin and respiratory tract; and any additional tests deemed appropriate by the examining physician or a licensed healthcare professional (PLHCP).

Information provided to the PLHCP: The employer shall ensure that the examining PLHCP has a copy of the standard, and shall provide the following information: a description of the affected employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to chromium (VI); the employee's former, current, and anticipated levels of occupational exposure to chromium (VI); a description of any personal protective equipment used or to be used by the employee, including when and for how long the employee has used that equipment; and information from records of employment-related medical examinations previously provided to the affected employee, currently within the control of the employer.

Employee training:

In addition to the requirements of the hazardous materials communication standard, the employer shall ensure that each employee can demonstrate knowledge of at least the contents of the standard and the purpose and a description of the medical surveillance program. The employer shall make a copy of the standard readily available without cost to all affected employees.



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### Record Keeping

**Air monitoring data** - The employer shall maintain an accurate record of all air monitoring conducted to comply with the requirements. This record shall include at least the following information:

The date of measurement for each sample taken; The operation involving exposure to chromium (VI) that is being monitored; Sampling and analytical methods used and evidence of their accuracy; Number, duration, and the results of samples taken; Type of personal protective equipment, such as respirators worn; and name, social security number, and job classification of all employees represented by the monitoring, indicating which employees were actually monitored.

**Historical monitoring data** - Where the employer has relied on historical monitoring data to determine exposure to chromium (VI), the employer shall establish and maintain an accurate record of the historical monitoring data relied upon. The record shall include information that reflects the following conditions:

- The data were collected using methods that meet the accuracy requirements.
- The processes and work practices that were in use when the historical monitoring data were obtained are essentially the same as those to be used during the job for which exposure is being determined.
- The characteristics of the chromium (VI) containing material being handled when the historical monitoring data were obtained are the same as those on the job for which exposure is being determined.
- Environmental conditions prevailing when the historical monitoring data were obtained are the same as those on the job for which exposure is being determined; and
- Other data relevant to the operations, materials, processing, or employee exposures covered by the exception.

**Objective data** - The employer shall maintain an accurate record of all objective data relied upon to comply with the requirements. This record shall include at least 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 chromium (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.

**Medical surveillance** - The employer shall establish and maintain an accurate record for each employee covered by medical surveillance. The record shall include the following information about the employee: Name and social security number; a copy of the PLHCP's written opinions; a copy of the information provided to the PLHCP.

The guidelines provided in this bulletin are only intended to provide an overview of some of the more important steps that can be taken by management to establish a safe workplace. The guidelines are not considered exhaustive of all measures and controls that can be implemented by management to address all potential loss or injury producing causes. Ultimately it is the responsibility of management to take the necessary steps to provide for employee and customer safety. It is not intended as an offer to write insurance for such conditions or exposures. The liability of Republic Indemnity Company of America and its affiliated insurers is limited to the terms, limits and conditions of the insurance policies underwritten by any of them. © 2022 Republic Indemnity of America, 4500 Park Granada, Suite 300, Calabasas, CA 91302.