


|   |                          |                     |                    |             |
|---|--------------------------|---------------------|--------------------|-------------|
|  | Health and Safety Policy |                     | Section No:        | 12.4        |
|   |                          |                     | Initial Issue Date | 1992        |
|   |                          |                     | Revision Date:     | Jan 1, 2017 |
|   |                          |                     | Revision No.       | 1           |
| <b>Hexavalent Chromium Exposure Procedure</b>                                     |                          |                     |                    |             |
| Prepared by: MSC Safety Solutions   | OSHA Standard            | 1926.1126/1910.1026 | Page:              | Page 1 of 8 |

## Purpose and Scope

The purpose of this Hex Chrom Procedure is to provide those workers, who may be exposed to Hexavalent Chromium (CrVI) (Hex Chrom), with the proper health and safety guidelines to avoid any associated hazards.

(CrVI) is a potential health hazard associated with the welding and cutting of stainless and alloy steels and many non-ferrous alloys, specialty paints and pigments, chrome plating, and in chemical synthesis. This Hex Chrom Procedure presents a rigorous exposure control program to prevent adverse health effects from occurring to our employees and subcontractors.

This Hex Chrom Procedure is also intended to facilitate compliance, for SESAC operations, with OSHA standards 29 CFR 1926.1126 for construction and 29 CFR 1910.1026 for general industry.

This Hex Chrom Procedure applies to all SESAC employees and subcontractors engaged in operations they may be exposed to Hexavalent Chromium.

## Responsibilities

Specific Health and Safety Program implementation responsibilities are stated in this Hex Chrom Procedure. Additional management, staff, employee, and subcontractor responsibilities are stated in individual procedures that address responsibilities specific to the Hex Chrom topic.

### Site Manager

The Site Manager is responsible to determine whether there is (CrVI) on the project in quantities where workers' exposure may exceed the action level and, if so, the requirements of this Hex Chrom Procedure are implemented.

### Supervisor


Supervisors are responsible for workers performing work covered. This Hex Chrom Procedure must confirm that each job has been properly evaluated for (CrVI) hazards and that these hazards have been properly eliminated or controlled.

### Site Safety Manager

The Site Safety Manager shall Assist the Site Manager with identifying potential (CrVI) exposure and addressing such in the project health and safety action plan, Review any planned personal monitoring program with industrial hygiene specialists, and assure maintenance of all site logs and recordkeeping required by this Hex Chrom Procedure.

## Definitions

|                   |   |
|-------------------|---|
| Action Level (AL) | Means worker exposure, from site task to site task, without regard to the use of respirators, to an airborne concentration of (CrVI) of 2.5 micrograms per cubic meter of air (2.5 ug/m <sup>3</sup> ) calculated as an 8-hour time-weighted average (TWA). |
|-------------------|---|

|   |                          |                     |                   |
|---|--------------------------|---------------------|-------------------|
|  | Health and Safety Policy | Section No:         | 12.4              |
|   |                          | Initial Issue Date  | 1992              |
| <b>Hexavalent Chromium Exposure Procedure</b>                                     |                          | Revision Date:      | Jan 1, 2017       |
|   |                          | Revision No.        | 1                 |
| Prepared by: MSC Safety Solutions   | OSHA Standard            | 1926.1126/1910.1026 | Page: Page 2 of 8 |

**Hexavalent Chromium (CrVI)** Means chromium in a +6 valence state in any form and in any compound. Other chromium valence states are less toxic, however, chromium can change valence states from non-(CrVI) to (CrVI) during heating or chemical processing.

**Objective Data** Information such as air monitoring data from industry-wide surveys or calculations based on composition or chemical or physical properties of a substance demonstrating the worker exposure to (CrVI) associated with a particular operating condition. The data must reflect workplace conditions closely resembling the processes, types of materials, control methods, work practices, and environmental conditions in the project's current operations.

**Permissible Exposure Limit (PEL)** An airborne concentration of (CrVI) at less than five micrograms per cubic meter of air (5 ug/m<sup>3</sup>) over an 8-hour TWA.

**Safe Harbor Level** Means worker exposures to (CrVI) are consistently below 0.5 µg/m<sup>3</sup> based on 8-hour TWA exposure. Project-wide exposure below the Safe Harbor Level of 0.5 µg/m<sup>3</sup> exempts site operations from requirements of this HSEP.

**Time-Weighted Average (TWA)** The average time, over a given work period, e.g., 8-hour workday of a person's exposure to a chemical or an agent. The average is determined by sampling for the contaminant throughout the time period. If an employee works more than 8 hours in one day, the PEL shall be reduced by the multiplier of 40 divided by the hours worked in a week.

## Procedure

### (CrVI) Identification

Scopes of work with the potential for (CrVI) exposures must be reviewed to identify any potential (CrVI) sources. This includes SDS reviews of metal and paint compositions for welding, cutting, grinding, and abrasive blasting operations as well as process operations, chrome plating operations, and painting where (CrVI) may be present, e.g., chromate pigments in paint formulations.


Note that chromium in most metal alloys is not in a (CrVI) state; however, during heating operations, such as welding, the chromium fume or dust is converted to (CrVI). Thus SDS may not identify (CrVI) as a constituent although chromium in another valence state is present.

### Health Hazards

(CrVI) exposure is associated with increased risk of lung cancer, asthma, nasal septum ulcerations and perforations, skin ulcerations and allergic and contact dermatitis.

### Allowable Levels of Exposure

The action level established by OSHA is 2.5 µg/m<sup>3</sup>, calculated as an 8-hour Time Weighted Average (TWA). This action level must be observed even if respiratory protection is provided to workers.

|   |                          |                     |                   |
|---|--------------------------|---------------------|-------------------|
|  | Health and Safety Policy | Section No:         | 12.4              |
|   |                          | Initial Issue Date  | 1992              |
| <b>Hexavalent Chromium Exposure Procedure</b>                                     |                          | Revision Date:      | Jan 1, 2017       |
|   |                          | Revision No.        | 1                 |
| Prepared by: MSC Safety Solutions   | OSHA Standard            | 1926.1126/1910.1026 | Page: Page 3 of 8 |

The Permissible Exposure Limit (PEL) is 5 µg/m<sup>3</sup>. No worker shall be exposed to (CrVI) at concentrations above the PEL averaged over an 8-hour period.

Project-wide exposure below the Safe Harbor Level of 0.5 µg/m<sup>3</sup> exempts site operations from requirements of this Hex Chrom Procedure.

## Personal Exposure Evaluation

---

Personal air monitoring is the primary method for evaluating worker exposure to (CrVI) and evaluating the need and effectiveness of exposure controls. Refer to the [OSHA Hexavalent Chromium in Workplace Atmospheres ID-215 Sampling and Analytical Method](#).

### Initial Exposure Assessment

For (CrVI) related operations, affected scope of work categories shall be evaluated for the potential for (CrVI) exposure. Work activities conducted adjacent to (CrVI) related activities shall also be evaluated.

An initial (CrVI) personal monitoring strategy must be developed for each project based on the exposed scope of work categories identified. For each separate job category, at least one representative potentially highest exposed worker shall be chosen for monitoring.

Within a scope of work category, if the work location or shift-work present significantly different exposure potential, additional personal monitoring must be conducted to include these variables.

If historical personal monitoring data is available for an operation, that data may be used provided the sampling and analytical sensitivity meets the requirements presented in the Exposure Monitoring Requirements paragraph of this Hex Chrom Procedure.

Where applicable, Objective Data may be used for specific operations in lieu of exposure monitoring. If Objective Data is used to determine the level of exposure, SESAC Safety Director must be notified and must approve the use of this data.

The exposure assessment must represent the worker exposure, which would occur without the use of a respirator.


## Exposure Monitoring Program

---

Based on the monitoring results from the initial exposure assessment for each job category with potential (CrVI) exposure, the following sampling program must be implemented. Representative sampling of the potentially highest exposed worker(s) in a job category shall be chosen.

If the results are above the PEL, periodic sampling must be repeated every three months.

If the results are at or above the AL but less than the PEL, periodic sampling must be repeated every six months.

|   |                          |                     |                   |
|---|--------------------------|---------------------|-------------------|
|  | Health and Safety Policy | Section No:         | 12.4              |
|   |                          | Initial Issue Date  | 1992              |
| Hexavalent Chromium Exposure Procedure  |                          | Revision Date:      | Jan 1, 2017       |
|   |                          | Revision No.        | 1                 |
| Prepared by: MSC Safety Solutions   | OSHA Standard            | 1926.1126/1910.1026 | Page: Page 4 of 8 |

Based on the initial exposure assessment, job categories with exposure levels below the AL are exempt from exposure monitoring.

For ongoing exposure monitoring, if the results are below the AL, sampling may be discontinued for workers in that job category if a confirmatory sample is collected and verifies that results are below the AL. The confirmatory sample must be collected not less than seven days after the initial finding.

If changes are made to the process or work practice that could result in a potential increase in (CrVI) exposure, additional monitoring for affected job functions must be conducted.

### Exposure Monitoring Requirements

Personal exposure monitoring shall be conducted for full work shift and the sample and analysis procedure shall follow the [OSHA ID-215 method](#) or equivalent and comply with field sampling methodology.

The monitoring shall be collected outside of any respiratory protection being used.

If a method other than [OSHA ID-215](#) is used, method documentation must demonstrate statistical accuracy of plus or minus 25% with a confidence level of 95% at or above the AL.

### Worker Notification

For exposure results exceeding the PEL, the worker or workers represented by the sample shall be notified in writing of the results or the results shall be posted in the workplace. Notification shall be made not more than five days after the receipt of the analytical results. This notification shall also include the corrective action to be taken to reduce affected worker exposure below the PEL.

### Exposure Control

Appropriate control methods to reduce exposures below the exposure limits are presented below.

### Engineering and Work Practice Controls


Engineering and work practice controls shall be used as the primary means to reduce (CrVI) exposures to below the PEL. Engineering controls include:

- ventilation,
- isolation of the worker from the (CrVI) source

Substitution of the (CrVI) source material with a non-(CrVI) source or one with a lower (CrVI) composition. Work rotation shall not be used to reduce exposures to meet PEL requirements.

### Respiratory Protection

Where engineering controls and work practices are not sufficient to reduce exposures to below the PEL, they shall be supplemented with respiratory protection. This finding must be documented in writing and verified with (CrVI) sampling data. Respiratory protection may also be used while engineering controls and work practices are being implemented.

|   |                          |                     |                   |
|---|--------------------------|---------------------|-------------------|
|  | Health and Safety Policy | Section No:         | 12.4              |
|   |                          | Initial Issue Date  | 1992              |
| <b>Hexavalent Chromium Exposure Procedure</b>                                     |                          | Revision Date:      | Jan 1, 2017       |
|   |                          | Revision No.        | 1                 |
| Prepared by: MSC Safety Solutions   | OSHA Standard            | 1926.1126/1910.1026 | Page: Page 5 of 8 |

Personnel required to wear a respirator will do so in accordance with SESAC Respiratory Protection Program.

The respiratory protection factors presented in Figure 1 (Bottom of this Procedure), Respirator Requirements Based on Airborne (CrVI) Concentrations, shall be used as minimum protection guidelines in selecting specific respiratory protection.

#### Protective Work Clothing and Equipment

A hazard assessment of individual (CrVI) related tasks shall be conducted to determine there are skin exposure hazards. If there is a skin or eye exposure hazard from (CrVI) contact and with consideration of past medical cases associated with (CrVI) skin exposure, a protective clothing program shall be instituted.

If protective clothing is worn, a worker change room shall be provided and procedures must be established to prevent (CrVI) contamination from leaving the workplace or contaminating workers' other clothing.

For a reusable protective clothing program, contaminated clothing to be laundered must be placed in a closed container to avoid the dispersion of the (CrVI) outside the change area. Hazard warning labels on the containers are required to identify that it is contaminated with (CrVI).

Disposable overalls, such as Tyvek, must be disposed of in sealed and labeled containers.

#### Hygiene Areas and Practices

For work involving (CrVI) exposures above the AL:

A worker change room shall be provided. Change rooms shall provide separate storage facilities to segregate work clothes from street clothing and designed to prevent cross-contamination.

Washing facilities shall be provided to remove contamination from face, neck, hands and arms. Employees shall wash at the end of work shift.


Prior to eating, drinking, smoking, chewing tobacco or gum, applying cosmetics, or using toilet facilities, workers shall wash their hands and face. Also, areas where these articles are used or stored shall be kept as free of (CrVI) as possible.

Before entering eating and drinking areas work clothing or equipment contaminated with (CrVI) shall have (CrVI) removed by vacuuming with HEPA filter attachment and/or wet methods, i.e., methods that do not spread contamination.

#### Regulated Areas and Housekeeping

Work areas with potential (CrVI) exposure levels above the PEL shall be identified as Regulated Areas, cordoned off, and have hazard warning signage to restrict access to workers in the (CrVI) medical surveillance and exposure monitoring program.

For construction projects, the Regulated Area requirement must be followed except for work task locations in which it is not feasible.

|   |                          |                     |                   |
|---|--------------------------|---------------------|-------------------|
|  | Health and Safety Policy | Section No:         | 12.4              |
|   |                          | Initial Issue Date  | 1992              |
| <b>Hexavalent Chromium Exposure Procedure</b>                                     |                          | Revision Date:      | Jan 1, 2017       |
|   |                          | Revision No.        | 1                 |
| Prepared by: MSC Safety Solutions   | OSHA Standard            | 1926.1126/1910.1026 | Page: Page 6 of 8 |

For work locations in which worker (CrVI) exposure exceeds the AL, work areas and surfaces shall be cleaned regularly, where feasible, to minimize the accumulation of (CrVI) dust. Vacuuming with HEPA filter attachment and wet methods should be considered.

### Medical Surveillance

Medical surveillance for (CrVI) shall be provided to workers, who

- are exposed to (CrVI) at or above the AL for 30 days or more a year,
- are experiencing health effects associated with (CrVI) exposure, or
- are exposed to (CrVI) in an emergency.

Examinations shall be provided within 30 days of assignment, annually, at termination, within 30 days of emergency exposure, or 30 days after a medical opinion recommending additional testing.

### Contents of Examination

A medical examination consists of:


- A medical and work history, with emphasis on
  - past, present, and anticipated future exposure to (CrVI);
  - 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.

### Information Provided to the Physician

The employer shall ensure that the examining physician has a copy of this 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 (CrVI);

- The employee's former, current, and anticipated levels of occupational exposure to (CrVI);
- 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.

|   |                          |                     |                   |
|---|--------------------------|---------------------|-------------------|
|  | Health and Safety Policy | Section No:         | 12.4              |
|   |                          | Initial Issue Date  | 1992              |
| Hexavalent Chromium Exposure Procedure  |                          | Revision Date:      | Jan 1, 2017       |
|   |                          | Revision No.        | 1                 |
| Prepared by: MSC Safety Solutions   | OSHA Standard            | 1926.1126/1910.1026 | Page: Page 7 of 8 |

- Physician's Written Medical Opinion
- The employer shall obtain a written medical opinion from the physician within 30 days for each medical examination performed on each employee, which contains:
  - The physician's opinion as to whether the employee has any detected medical condition(s) that would place the employee at increased risk of material impairment to health from further exposure to (CrVI);
  - Any recommended limitations upon the employee's exposure to (CrVI) or upon the use of personal protective equipment such as respirators;
  - A statement that the physician has explained to the employee the results of the medical examination, including any medical conditions related to (CrVI) exposure that require further evaluation or treatment, and any special provisions for use of protective clothing or equipment.

The Physician shall not reveal to the employer specific findings or diagnoses unrelated to occupational exposure to (CrVI).

The employer shall provide a copy of the physician's written medical opinion to the examined employee within two weeks after receiving it.

The written medical opinion from the Physician shall be retained in the program files. A copy of the opinion for SESAC' employees shall also be sent to SESAC Occupational Health Services.

### **Hazard Communication**

---

Employees working on tasks with (CrVI) shall have annual Hazard Communication training on (CrVI).

The training shall include the requirements of this Hex Chrom Procedure and the OSHA Standard 1926.1126 (construction) or 1910.1026 (general industry), whichever is applicable.

### **Recordkeeping**


---

All records of all personal air monitoring conducted for (CrVI) exposure shall be maintained as long-term records as set forth in the company.

When historical data or Objective Data are used for compliance with this program, those records shall also be maintained as long-term records.

Medical records shall be retained for the duration of employment plus 30 years.

### **Project-Specific Written Program**

|   |                          |                     |                   |
|---|--------------------------|---------------------|-------------------|
|  | Health and Safety Policy | Section No:         | 12.4              |
|   |                          | Initial Issue Date  | 1992              |
| <b>Hexavalent Chromium Exposure Procedure</b>                                     |                          | Revision Date:      | Jan 1, 2017       |
|   |                          | Revision No.        | 1                 |
| Prepared by: MSC Safety Solutions   | OSHA Standard            | 1926.1126/1910.1026 | Page: Page 8 of 8 |

All projects with potential (CrVI) exposure based on identification described in Identification Procedure may be subject to develop a written Project-Specific Hexavalent Chromium Protection Program.

The written program shall address all program elements presented above.

All requirements of this Hex Chrom Procedure, except engineering controls, must be implemented by November 27, 2006

The engineering controls described above must be in place by May 31, 2010.

#### References and Related Documents

OSHA Hexavalent Chromium in Workplace Atmospheres ID-215 Sampling And Analytical Method

**Figure 1  
Respirator Requirements Based on Airborne (CrVI) Concentrations**

| <b>Airborne (CrVI) Concentration</b>   | <b>Required Respirator</b>   |
|--|--|
| Half-mask, air-purifying respirator equipped with high efficiency filters  | Between 5 $\mu\text{g}/\text{m}^3$ and less than 50 $\mu\text{g}/\text{m}^3$ (10x the PEL)     |
| Full-face piece, air-purifying respirator with high efficiency filters   | Between 50 $\mu\text{g}/\text{m}^3$ and less than 250 $\mu\text{g}/\text{m}^3$ (50x the PEL)   |
| Any air-powered, air-purifying respiratory with high efficiency filters, or half-mask supplied air respirator operated in a positive-pressure mode | Between 250 $\mu\text{g}/\text{m}^3$ and less than 500 $\mu\text{g}/\text{m}^3$ (100x the PEL) |
| Air respirators with full-face piece, hood, helmet, or suit operated in positive-pressure mode   | Less than 500 $\mu\text{g}/\text{m}^3$ (100x the PEL)  |