

# Hexavalent Chromium

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## What Is It?

Hexavalent chromium, also called hex chrome, chrome six or CrVI, does not occur naturally. It is generated through industrial processes and hot work activities. It exists in a few different forms:

Chromate pigments	Dyes Paints Inks Plastics
Chromate added as anti-corrosive agents	Paints Primers Other surface coatings
Chromic acid	Electroplating that adds protective and decorative coatings

Chromium becomes hexavalent chromium only when exposed to high temperatures. This may occur during hot work including:

- Working on industrial materials
- Chroming operations
- Melting down chromium metal

Doing any hot work, such as welding, on a material containing chromium will cause the chromium to become hexavalent chromium.

## Who Is Affected?

There are three types of workers who have an increased risk of exposure:

- Hot work workers (welding, cutting, grinding, brazing)
- Chroming workers
- Painters

There are also other groups that have a lesser degree of risk than the top three.

## Health Hazards

Hexavalent chromium is a known carcinogen. There are some serious potential health hazards associated with exposure to hexavalent chromium. Recognizing these symptoms early can alert you to an overexposure.

- **Eyes:** If chromic acids or chromate dusts have direct contact with your eyes, they can cause a burning irritation or permanent eye damage.
- **Respiratory tract:** Exposure to hexavalent chromium can irritate your nose, throat and lungs. Prolonged or repeated exposure can severely damage the mucous membranes in your nasal passages and result in ulcers or perforation of the septum.

- **Skin:** Prolonged exposure to hexavalent chromium can result in skin ulcers and dermatitis.
- **Lungs:** Hexavalent chromium can cause lung cancer.

Hexavalent chromium can **enter your body** in three ways:

- Inhalation (breathing airborne dust, fumes or mist)
- Ingestion (via contaminated food, drinks and cosmetics)
- Absorption (through skin)

Family members are also susceptible to hexavalent chromium exposure from contaminated clothing and other items brought home by employees.

## Resources

Refer to your employer's hazard communication program to determine if you are exposed to hexavalent chromium in your workplace.

Refer to the manufacturer's Safety Data Sheet (SDS) to learn more about:

- The particular hazard
- The proper ways to protect yourself
- First aid procedures in the event of exposure

On SDSs, hexavalent chromium will often appear as chromate.

## Controls

### ***Engineering Controls***

Engineering controls include:

- Substitution (e.g., using a less toxic material or process that results in lower exposure)
- Isolation (e.g., enclosing the source of exposure)
- Ventilation (e.g., using a local exhaust system that captures airborne hex chrome near its source)

Employers must ensure good **ventilation** of fumes by:

- Using local exhaust ventilation
- Making sure air is not re-circulated or discarded (per environmental regulations)
- Using capture velocities of less than 1 meter per second, or 200 feet per minute, so shielding gas is not affected (if applicable)
- NOT opening windows or doors or using cooling fans
- Regularly cleaning and maintaining local exhaust ventilation (LEV) systems

### ***Work Practice and Administrative Controls***

Employers must also:

- Establish a regulated area whenever an employee's exposure to airborne concentrations of hexavalent chromium is, or can reasonably be expected to be, in excess of the permissible exposure limit (PEL)
- Ensure that regulated areas are identified (e.g., warning signs, gates, ropes, barricades, lines, textured flooring)
- Limit access to regulated areas
- Authorize all work and employees in regulated areas

## ***Cleaning***

Your employer must ensure that all surfaces are maintained as free as possible of accumulations of hexavalent chromium.

Surfaces contaminated with hexavalent chromium must be cleaned by high-efficiency particulate air (HEPA)-filtered vacuuming or other methods that minimize exposure, including wet methods such as wet sweeping or wet scrubbing.

Dry shoveling, dry sweeping and dry brushing may be used only where HEPA-filtered vacuuming or other methods that minimize the likelihood of exposure to hexavalent chromium have been tried and found to be ineffective.

Do not use compressed air to remove hexavalent chromium from any surface unless:

- The compressed air is used in conjunction with a ventilation system designed to capture the dust cloud created by the compressed air
- No alternative method is feasible

To protect yourself from hexavalent chromium exposure:

- Wash your hands at the end of your work shift and before eating, drinking, smoking, or applying lip balm or cosmetics
- Wear outer garments to avoid contaminating primary clothing
- Avoid bringing contaminated clothing or other articles home
- If bathing facilities are present, shower before leaving work
- Never eat, drink, smoke or vape in areas where hexavalent chromium is present

## ***Personal Protective Equipment (PPE)***

The PPE you need to use is determined by your employer.

If respirators are required:

- The type will depend on workplace conditions and contaminant levels
- They can only be worn by authorized, trained and medically qualified personnel

Typical PPE includes:

- Heat-resistant PPE approved for welding (coveralls, welding shield, leather gloves, welding apron/coat)
- Splash-proof goggles
- Face shields
- Chemical-resistant gloves
- Aprons
- Protective footwear

Make sure you are aware of the requirements and follow your employer's PPE program. If you have any questions, contact your supervisor.

## **Additional Requirements**

Employers must

- Have a written plan for hexavalent chromium operations
- Make an initial exposure determination and communicate the exposure risks to employees
- Prepare and update a written plan describing the specific control steps being taken to reduce employee exposure to or below the PEL

Each employee engaged in hexavalent chromium operations must be provided documented training relating to the hazards and precautions for its safe use.

Employers are also required to have a medical surveillance program as well as a respiratory protection program.

## **Medical Surveillance**

In the U.S. and various other regions, medical surveillance must be provided to employees who are exposed to hexavalent chromium at or above the action level for 30 or more days a year.

Medical examinations must be provided within 30 days after initial assignment to a job involving hexavalent chromium exposure, unless the employee has received an examination that meets the requirements of the standard within the last 12 months.

The written medical opinion must be obtained within 30 days of the examination and must contain the medical professional's opinion as to whether the employee has any detected medical condition that would increase risk.

## **Emergencies**

In the event of an emergency or uncontrolled release of hexavalent chromium, immediately utilize an eyewash station and/or shower and be sure to wash your hands to remove metals. Notify your supervisor and seek medical treatment within 30 days after exposure during an emergency or uncontrolled release.

In the U.S., workers must be seen by a physician or other licensed healthcare professional (PLHCP), and an opinion must be provided within 30 days. Other countries have similar requirements.