

# *Welding and Exposure to Hexavalent Chromium*

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*January 2011*- This bulletin is intended to provide information about hexavalent chromium hazards to employers and workers involved in welding operations in Prince Edward Island.

Hexavalent chromium is a toxic form of the element chromium, found mainly in products of industrial processes such as pigments, metal finishing, wood preservatives and fungicides.<sup>1</sup> Hexavalent chromium is also present in fumes generated from welding stainless steel and chromium alloys, and from welding rods themselves.<sup>2</sup> Inhaling airborne hexavalent chromium may negatively affect a worker's health over time, and it is important that employers and workers cooperate to protect the health of workers.

Hexavalent chromium is classified by National Toxicology Program as a carcinogen which, when inhaled, may increase the risk of lung cancer.<sup>3</sup> The threshold limit value defined by current ACGIH standards is 0.01 mg/m<sup>3</sup> for an 8-hour time weighted average. <sup>4</sup> Beyond this limit, workers would be considered overexposed to hexavalent chromium and, therefore, at increased risk of developing lung cancer or other respiratory irritation over time.

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### **What Employers Can Do**

Employers who have stainless steel welding processes or other tasks that may result in workers being exposed to hexavalent chromium levels above the threshold limit value must take every reasonable precaution to protect the health of the workers. This includes the following:

#### **Engineering Controls**

Reduce exposure levels to those under the threshold limit value, if possible, through using engineering controls such as enclosures and improving ventilation. For suggested ventilation options, you may go online to view Alberta's Welder's Guide at [http://employment.alberta.ca/documents/WHS/WHS-PUB\\_ch032.pdf](http://employment.alberta.ca/documents/WHS/WHS-PUB_ch032.pdf) or contact our office using the contact information below.

#### **Personal Protective Equipment**

Provide appropriate respirators to exposed workers. Respirators must be selected and fit tested according to the CSA Standard Z94.4, "Selection, Care and Use of Respirators." Ensure that workers are trained on how to use, store and maintain respirators so that they continue to meet the CSA standard. If in doubt, check with a supplier or manufacturer for selecting the best respirator for the hazard. You may view CSA standards used in Canadian OHS regulations by registering online at [www.ohs.csa.ca](http://www.ohs.csa.ca).

## Safe Work Practices

Develop safe work procedures such as accessing up-to-date Material Safety Data Sheets, appropriate worker hygiene and ventilation use. The employer must train workers and supervise them to ensure the procedures are being followed. For more information on developing safe work practices and procedures, please contact our office using the contact information below.

## Medical Surveillance Program

The employer is advised to monitor workers exposure levels through a medical surveillance program, which may require workers to attend medical exams involving blood work and urinalysis to determine whether levels of hexavalent chromium are in the body. If a medical professional finds levels of hexavalent chromium in the worker's body that indicate the worker is being exposed beyond threshold limit values, the employer must determine whether the workplace protective measures are appropriate and if any changes are necessary. For more information on medical surveillance programs, please contact our office using the contact information below.

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## What Workers Can Do

Workers are required to take every reasonable precaution to protect his or her own occupational health and safety. This includes being obligated to report hazards. If a worker suspects workplace exposure to airborne hexavalent chromium, he/she must report this hazard to the employer. Consulting with the safety committee and/or safety representative is recommended.

Workers are obligated to cooperate with the employer to protect his or her own occupational health, which means:

- Following required safe work procedures
- Wearing the personal protective equipment that the employer determines necessary to protect workers from hazards.
- Cooperating with any medical surveillance program the employer deems appropriate.

Remember, welding gases and fumes do not normally cause immediate health problems. However, years of welding work that exposes workers to levels of hexavalent chromium greater than the threshold limit values<sup>4</sup> increases a worker's likelihood of developing health problems. Employers and workers cooperating together to protect the worker's health is the key to success.

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## References

1. U.S. Department of Labor, Occupational Safety and Health Administration (2009). Hexavalent Chromium. Available from <http://www.osha.gov/Publications/OSHA-3373-hexavalent-chromium.pdf>
2. Government of Alberta, Employment and Immigration (2009). Welder's Guide to the Hazards of Welding Gases and Fumes. Available from [http://employment.alberta.ca/documents/WHS/WHS-PUB\\_ch032.pdf](http://employment.alberta.ca/documents/WHS/WHS-PUB_ch032.pdf)
3. U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program (2010). Report on Carcinogens, 11<sup>th</sup> Ed: Chromium Hexavalent Compounds. Available from <http://ntp.niehs.nih.gov/ntp/roc/eleventh/profiles/s045chro.pdf>
4. American Conference of Governmental Industrial Hygienists. 2010 Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices. Cincinnati, OH: ACGIH, 2010.