

## LEHDER Environmental Services

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## Heavy Metals & Your Health

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### Introduction

Heavy metals can be found in a variety of different workplaces. Over-exposure to heavy metals from occupational settings can be toxic in certain concentrations and lead to serious long term illnesses.

Some of the more common metals that fall into this category of “heavy metals” include: arsenic, beryllium, cadmium, hexavalent chromium, copper, lead, mercury and nickel.

The Ontario government has proposed changes to exposure limits for some metals and has started to focus their inspections on common sources of metals such as **welding activities**.

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### Who is impacted?

The list of industries where heavy metals are found is long and wide-ranging. Some examples include:

- Mining and smelting
  - Ceramic manufacturing (e.g. ignition modules)
  - Electronic applications (e.g. transistors)
  - Metal recycling
  - Sporting goods (e.g. golf clubs or bicycle frames)
  - Pigments, paints, dyes or inks containing chromates
  - Motor vehicle parts and manufacture
  - Wood preservation
  - Laboratory work
  - Battery manufacture
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### Health Effects

A fine balance is required in the human body as it relates to heavy metals. A little is needed to function normally but excess amounts can cause serious illnesses.

Welding fumes and dusts contain a multitude of metals including manganese, copper, nickel, etc. that can affect the central nervous system (e.g. tremors), respiratory system and liver. In addition, welders may suffer from flu-like symptoms, e.g. metal fume fever when exposed to copper and other metals.

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### Health Effects - *continued*

Lung cancer and irreversible scarring of the lungs are associated with many heavy metals such as beryllium (chronic beryllium disease) and hexavalent chromium. Occupational asthma has been linked to exposure to solder flux during welding operations.

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### Exposure Limits in Ontario

Many heavy metals have individual exposure limits set out within Ontario Regulation 833. Additionally, lead and arsenic are Designated Substances in Ontario and have their own respective regulations (O.Reg.836 & O.Reg.843).

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### Upcoming Changes to Limits

#### Beryllium

The Ontario Occupational Exposure Limit (OEL) for beryllium is currently under review with the suggested change being drastically lower, and with a particle-size selective criteria.

**Current Exposure Limit:**  
Beryllium and its compounds  
0.002 mg/m<sup>3</sup>

**Proposed Exposure Limit:**  
Beryllium and its compounds – Skin  
0.00005 mg/m<sup>3</sup> (inhalable)

#### Welding Compounds

The MOL has proposed revoking the OEL for iron-containing welding fume and replacing it with an OEL for Iron Oxide (respirable) of 5 mg/m<sup>3</sup>. The MOL has also proposed changing the vanadium size selective criteria from respirable to inhalable.

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### How can LEHDER assist?

LEHDER can help employers to assess whether their workers are being exposed to heavy metals by conducting personal airborne exposure monitoring and suggest ways of lowering exposures.

Additionally, LEHDER can help employers address the following types of questions:

- Are we using the correct PPE – gloves or respirator?
- Are the local exhausts / smoke eaters working properly?
- Is housekeeping adequate?
- Is contamination of hands or clothing occurring?
- Is product substitution needed – pellet vs. powder?

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## Helpful Web Links

Information on health effects and how workers can be exposed is available by accessing the Occupational Health Clinics for Ontario Workers.

**Nickel ; Chrome Plating ; Hexavalent Chromium**

[www.ohcow.on.ca/resources/handouts.html](http://www.ohcow.on.ca/resources/handouts.html)

The Ontario Ministry of Labour issues health and safety "ALERTS".

**Beryllium**

[www.labour.gov.on.ca/english/hs/alerts/a21.html](http://www.labour.gov.on.ca/english/hs/alerts/a21.html)

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## LEHDER Capabilities

LEHDER capabilities in Industrial Hygiene include:

- Personal exposure monitoring to chemical or physical agents
  - Health hazard assessments of new or existing processes and products
  - Designated substances assessments including asbestos
  - Hazardous building materials assessments
  - Hazard control programs
  - Health and Safety program development and support
  - Site specific health and safety training program
  - Indoor air quality assessments, including mould
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## Questions?

For further information or questions please contact:

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## About LEHDER

LEHDER is one of the largest Air Quality Management consulting companies in Canada. Our team of consulting professionals is built around our core strength in industrial environmental, health and safety management. LEHDER recognizes our client's need to make decisions that provide for operational flexibility while meeting regulatory, economic and social requirements. Visit our web pages at: [www.lehder.com](http://www.lehder.com)

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