

LEAD EXPOSURE in Demolition Workers

BACKGROUND INFORMATION

In the construction industry, lead compounds are often used in paint primers which are applied to iron and steel structures. Lead is also used in various metal alloys, and found in lead pipes or lead shielding in walls (i.e. in x-ray labs). Demolition workers may be exposed to lead when cutting lead-painted surfaces or lead-containing metals with a torch (releasing a harmful lead fume). Lead dust may be created when grinding or using a chop saw on these materials.

You may test for the presence of lead at your demolition site by bringing in a sample to a qualified analytical laboratory. Contact the laboratory for information on effective sampling.



ROUTES OF EXPOSURE

- **Inhalation** – occurs when workers breathe in a lead fume or airborne dust - this is generally the most common route of exposure. Inhalation may also occur if a worker smokes while he or she is contaminated with lead dust.
- **Ingestion** – particles of lead dust can be swallowed by the worker if they get them on hands or clothing, or if they contaminate food or beverages. As well, without proper precautions, lead dust can stay on work clothes and be brought home, potentially affecting the worker's family.

HEALTH EFFECTS

Exposure to lead can cause temporary or permanent damage to the central and peripheral nervous systems, kidneys, heart, bones, blood, and reproductive systems (reduced fertility).

Some **symptoms** of lead poisoning:

- Headache	- Loss of appetite	- Insomnia	- Metallic taste in mouth
- Weakness	- Nausea	- Hyperactivity	- "Lead line" on gums
- Fine Tremors	- "Wrist Drop"	- Dizziness	- Stomach aches and cramps

MONITORING FOR LEAD

In Manitoba, the Occupational Exposure Limit (OEL) for lead is **50 ug/m³** (micrograms per cubic metre). This limit is a time-weighted average for an 8 hour workday and a 40 hour work week. **Employers must ensure that worker exposure is kept below the OEL.** Control measures must be implemented to keep exposures below the OEL. When exposure is between an action level of 25 ug/m³ and the OEL of 50 ug/m³, employers may need to implement monitoring of airborne lead. Alternatively, in place of monitoring, employers may be required to implement control measures to reduce exposures.

ASSESSMENT

Once the presence of lead has been confirmed, employers should conduct an assessment of the risk for lead exposure at the workplace to determine what control measures are required to ensure that exposures are kept at safe levels. This assessment will evaluate:

- The potential concentrations of airborne lead.
- The possibility and extent of exposure to airborne lead.
- The control measures feasible for the operation.

REDUCE YOUR EXPOSURE

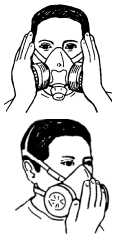
The following are control measures that may be used to reduce airborne lead:

- **Preferred Methods of Cutting**
 - Consider cutting with mobile hydraulic shears.
 - When feasible, use pneumatic air tools or impact wrenches to remove rivets or bolts.
 - Use hand shears or hydraulic shears to cut lead or lead alloy pipes.
- **Torch Cutting** – When the operation requires torch cutting, respirators must be worn. In addition, exposure may be reduced with the following strategies:
 - Where practical, remove lead paint before torch cutting. It is recommended that paint be removed to at least 4 inches on either side of the cut line. Paint removal techniques such as abrasive blasting or chemical stripping may be hazardous themselves. Appropriate precautions should be taken - if possible, use paint removal methods that wet down surfaces or vacuum up dust.
 - Use long-handled torches when cutting to increase the distance between the worker and the source of airborne lead.
 - Where possible, work upwind from the source of contamination.
- **Dust Control**
 - Continuously wet down areas where lead dust is being generated.
 - Use a dust collection system (e.g. vacuum attachments for tools).
- **Respirators** – Exhaust ventilation is used in industrial applications where exposure to lead may occur. However, the inherent limitations of a demolition site usually do not allow for such a system. Respirators will be required as the last line of defence from airborne lead.
 - The proper type of respirator should be chosen based on the level of airborne lead and other hazards present (e.g. other chemicals, eye hazards). Selection must be in compliance with the current CSA standard Z94.4 *Selection, Care, and Use of Respirators*. Respirators must be chosen so that exposure does not exceed the respirator's protection factor. In most cases, a NIOSH-approved N-100, R-100, or P-100 filter should be used. Consult with your protective equipment supplier.
 - When choosing a respirator, proper fit must be achieved. Use *fit testing* (as outlined in the CSA standard) to determine an ideal fit for each individual employee.
 - Perform a "user seal check" before every use:

Negative Pressure Seal Check – Cover the filters so that air cannot pass through. Collapse the mask by inhaling gently and holding your breath for at least 10 seconds. If no leakage can be detected then the mask has passed this seal check.

Positive Pressure Seal Check – Cover the exhalation valve so that air cannot pass through. Inflate the mask by exhaling gently and waiting a few seconds. If no leakage can be detected then the mask has passed this seal check.

If leakage is detected in either test, readjust the straps, check for damaged parts, and perform the test again. **Never use a respirator that cannot pass a user seal check.**



- Clean respirators at the end of the day and store them in an uncontaminated area. Regularly inspect the respirator for damaged or worn parts.

HYGIENE

- Employees must change out of street clothes and into work clothes (e.g. coveralls) before entering the job site. At the end of the day, employees must shower and change back into street clothes.
- To prevent contamination, work clothes must be stored separately from street clothes.
- Designated areas for eating and smoking must be separate from work areas. Outer protective clothing must be removed or thoroughly cleaned before entering a smoking or eating area. Hands must be washed thoroughly before eating or smoking.
- Work clothes must not be brought home. Work clothes must be laundered at the job site or laundered professionally (the professional laundry company must be aware of, and well equipped for, the lead hazard).
- Lead-contaminated water must be disposed of in accordance with hazardous waste regulations. Contact Manitoba Conservation (phone 945-7100) for more information.

EMPLOYER RESPONSIBILITIES

- Employers are responsible for training and informing workers on the hazards of lead and the prevention of lead poisoning.
- Adequate protective equipment must be provided.
- Medical monitoring may be required to ensure workers are not overexposed. Workers who are likely to be exposed to lead should have their initial baseline blood lead level determined.

For more detailed information on lead hazards and prevention, obtain Workplace Safety and Health's Guideline for Working with Lead.