

General Information for Managers and Workers

Aim of the Guidance Note

This guidance note provides information to help workers protect themselves and help employers minimise the risk of occupational exposure to lead.

The lead industry, represented by the International Lead Association (ILA), is committed to the safe production and use of lead, to the benefit of the global economy and society in general, whilst safeguarding human health and minimising the impact of its operations on the environment.

ILA members subscribe to a set of principles embodied in the **Lead Action 21 Charter***. In the spirit of that Charter, a series of Guidance Notes has been produced to help inform employers and workers around the world on how to work safely with lead.

[*www.ila-lead.org/responsibility/la21-charter](http://www.ila-lead.org/responsibility/la21-charter)



Safety signage, Colombia



Personal protective equipment (PPE) in use at a smelter, Canada

When are workers most at risk?

While lead is not generally absorbed through the skin, it can enter the body when lead dust, fume or vapour is inhaled. It can also be swallowed, for instance, if you eat or drink after working with lead without first washing your hands thoroughly.

Work activities which could pose a potential risk of lead exposure include:

- lead smelting, refining, recycling, alloying and casting
- lead-acid battery manufacture
- manufacturing lead based compounds
- manufacturing leaded glass
- sand-blasting removal and burning of old lead paint
- stripping old lead-based paint from doors, windows etc
- hot cutting lead pipes during demolition and dismantling operations
- recycling activities, including recovering lead from used lead-acid batteries
- working with metallic lead and alloys containing lead, e.g. soldering
- production processes using leaded pigments, stabilizers, colours and ceramic glazes.

What are the effects of lead exposure?

Lead enters the body after inhalation or ingestion and will be found in the blood, soft tissues and bones.

Lead health effects increase with the intensity and duration of exposure – moderate exposure levels will be associated with subtle alterations of the nervous system, haemoglobin production and function of the kidneys and reproductive systems. Prolonged high exposure will cause more serious effects that include anaemia, kidney damage, nerve and brain damage and infertility. High level uncontrolled exposure can also result in lead poisoning, characterised by headaches, fatigue, constipation, nausea, weight loss, mental confusion, coma, convulsions or even death.

What measures should an employer take to protect workers?

Each working situation is different and exposure levels should be assessed on the particular conditions that apply. However, if a worker is likely to be exposed to lead, lead compounds, dust, fume or vapour, employers must assess the risk to health and determine what precautions are needed to provide protection.

There are also generic risk management measures which apply to the majority of lead exposure scenarios:

- **Engineering and Ventilation Controls**
Equipment that minimises lead emissions, including enclosure of equipment, negative draft exhaust systems that suck dust back into enclosures and keep contaminated air out of canteen areas, and/or specific local exhaust ventilation, should be installed where there are unavoidable sources of emissions.

Ventilation in work areas should be balanced to ensure that airflow moves from areas of low exposure to areas of potentially high exposure. Air captured by ventilation controls may require treatment, to minimise toxic substances, prior to its discharge or recirculation.

- **Workplace Cleaning**

Frequent washing/HEPA vacuuming is essential to maintain safe working conditions. The workplace should also be cleaned thoroughly at the end of every shift. However never use a broom to dry sweep the workplace



Filter Plant (Baghouse), Colombia



Tapping the furnace with the appropriate PPE, Australia

- **Personal Protective Equipment (PPE)**

Where an assessment of the production area has indicated the need for PPE, employers should consider implementing a compliance policy. This policy can ensure the correct use of masks or respirators at all times, and that workers do not remove their masks to communicate. Infringement of any compliance policy may include disciplinary measures.

Workers in areas of significant exposure should have clean work clothes provided every day and in such cases, all work clothing should be cleaned on site by the employer under controlled conditions. Formal mask and respirator fit testing, cleaning and filter change regimes must also be maintained.

Workers should make sure their safety equipment is in good condition, fits well, is properly maintained and that they follow the instructions for its use.

- **Personal Hygiene**

Employers should ensure workers have knowledge of and enforce basic, but essential, hygiene rules:

- Do not wipe away sweat with hands or arms – employers should provide disposable towels.
- Use disposable tissues, rather than a handkerchief
- Do not bite fingernails and keep them cut short.
- Do not wear work clothing in eating and non-production areas.
- Depending on the risk assessment, workers should shower, or at least wash, hands, arms, faces and mouths. They should also change into personal clothing, or coveralls provided by the employer, before entering eating areas.
- At the end of a shift workers in high exposure areas must pass through a room with wash basins to clean their hands; then a 'plant side' changing room to remove work clothing; then through showers into a changing room on the 'clean' side to change into personal clothing to leave the workplace.
- Employers should provide soap and clean towels and should not allow any personal items to be taken into production areas, or allow any work items to be taken off site.

- **Blood lead monitoring**

Employers should initiate a blood lead monitoring regime which covers all employees, in all site activities, where there is a potential for lead exposure.

Certified, or approved, blood lead testing equipment, or accredited laboratories, should be used to measure blood lead levels.

A policy to ensure regular monitoring should be put in place and workers in areas of high airborne levels of lead and those with high blood lead levels should be tested more frequently.

The action level is typically at least $5\mu\text{g/dL}$ below the exposure limit deemed to be safe (please refer to the relevant national legislation for exposure limits). If the action level is exceeded appropriate measures should be taken. These should include counselling on work practice and hygiene, followed by a personal lead exposure management plan and an increased blood sampling frequency. It might also include a ban on overtime and working in areas of high airborne levels of lead.

If the safe threshold is exceeded then more prescriptive measures should be taken to ensure hygiene procedures are followed and protective equipment is used correctly. The employee should be moved to an area of lower exposure, or removed from the lead environment entirely. The frequency of blood lead sampling should be further increased and continued until the results are again below the first action point.



Damping down the work area with a hose, UK

CHECKLIST

Priority checklist for managers and workers

1. Plant workers must wear the designated clothes, provided by their employer, in the workplace.
2. Wear clean workwear every day or shift and change during the working day if necessary.
3. Wear the appropriate fit tested and properly maintained respiratory equipment, and/or apply the correct ventilation.
4. Always shower after every shift and whenever potential contamination risks have been high.
5. Do not take workwear home for washing or cleaning
6. Adopt work practices that minimise or mitigate occupational lead exposure.
7. Segregate work areas from administrative offices and eating areas.
8. Ensure that eating and drinking areas are always clean and lead free.
9. Always wash hands and face and scrub nails prior to eating at the workplace.
10. Never smoke at work.

Additional information

These websites have useful information on workplace health and safety.

National Institute for Occupational Safety and Health
www.cdc.gov/niosh/topics/lead/

Occupational Safety and Health Administration.
www.osha.gov/

California Department of Public Health
www.cdph.ca.gov/

International Lead Management Center
www.ila-lead.org/responsibility

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The International Lead Management Center (ILMC) was created in 1996 by the international lead industry, in conjunction with the OECD. The ILMC offers hands-on advice and assistance from its experts to developing countries across the globe. It works with the lead industry, the Basel Secretariat (SBC), government environment agencies and intergovernmental bodies, such as the UN International Lead Zinc Study Group (ILZSG) and NGOs such as the Blacksmith Institute. The ILMC assists with the management of the risks associated with lead and its impact on the environment and human health across all aspects of the lead industry from mining, smelting, refining and product recycling. For more information on the work of the ILMC please contact info@ilmc.org