

Surface testing - lead

Surface lead testing can be used to identify the presence of lead on surfaces in the workplace. This high-level guidance is designed to assist persons conducting a business or undertaking (PCBUs) to understand what surface lead testing is and how it can be used in the workplace to manage lead exposure risks.

1. Lead exposure in the workplace

Lead is a naturally occurring metal, which can combine with other substances to form various lead compounds. Under the model WHS Regulations, lead is defined as '*lead metal, lead alloys, inorganic lead compounds and lead salts of organic acids*' and is classified as a hazardous chemical.

Lead predominantly becomes a health hazard to workers when the dust, fumes or mist generated when working with lead are inhaled, or when lead contamination on hands is swallowed while eating, drinking, smoking or vaping. In some cases, lead can also be absorbed through the skin, such as when workers are exposed to some aviation fuels.

The health effects from lead exposure depend on a variety of factors such as a person's age, the amount of lead they are exposed to and for how long, and if they have any other health conditions. Some of the health effects for adults include decreased kidney function, heart-related issues, increased blood pressure and risk of hypertension, and reproductive issues. In more severe cases, exposure to lead can result in death.

Undertaking regular assessments of the workplace to look for signs that lead is present can help determine if workers are potentially being exposed to lead, such as checking for lead dust on surfaces, clothing or employees' hands. However, lead can be invisible to the eye, and it may be necessary to undertake testing to determine if, and how much, lead is present in the workplace.

2. WHS duties for lead exposure in the workplace

Under the model WHS laws, PCBUs have a primary duty of care to ensure the health and safety of workers and other persons. To comply with this, PCBUs must eliminate or minimise risks to health and safety so far as is reasonably practicable. In recognition that exposure to lead can cause significant harm, Part 7.2 (Lead) of the model WHS Regulations includes specific duties to manage risks from exposure to lead. These duties apply in workplaces where lead processes are carried out.

The lead regulations impose duties upon PCBU's to control the risk of lead contamination using specified measures. This includes, but is not limited to:

- ensuring, so far as is reasonably practicable, that lead contamination is confined to a lead process area at the workplace
- ensuring, so far as is reasonably practicable, that a lead process area at the workplace is kept clean, and the cleaning method used does not create a risk to the health of persons in the immediate vicinity and does not have the potential to spread the lead contamination
- taking all reasonable steps to ensure that a person does not eat, drink, chew gum or smoke in a lead process area at the workplace
- providing workers with an eating and drinking area that, so far as is reasonably practicable, cannot be contaminated with lead from a lead process
- providing and maintaining in good working order changing rooms and washing, showering and toilet facilities at the workplace to minimise secondary lead exposure from contaminated clothing, minimise lead ingestion and avoid spreading lead contamination, and
- ensuring, so far as is reasonably practicable, that workers remove clothing and equipment that is, or is likely to be, contaminated with lead, and wash their hands and faces before entering an eating or drinking area at the workplace.

PCBU's must also ensure air and health monitoring is undertaken where required. This includes:

- undertaking air monitoring if there is uncertainty (based on reasonable grounds) as to whether the airborne concentration of lead (e.g. lead dust, lead mist or lead fumes) at the workplace exceeds the exposure standard, or to determine whether there is a health risk, and
- providing health monitoring to all workers undertaking 'lead risk work' to minimise the risk of adverse health effects by regularly checking the blood lead levels of these workers. The health monitoring guide for lead can be found at [Health monitoring for lead \(inorganic\) | Safe Work Australia](#).

3. What is surface lead testing?

Surface lead testing involves collecting a sample from a potentially contaminated surface, such as the floor or a workbench, to test for the presence of lead. There are different methods which can be used to conduct surface lead testing, including:

- **Field tests:** These tests involve rubbing a chemical swab against a surface, or spraying the surface with a chemical and shining a ultraviolet (UV) light on it and checking for a change in colour which indicates lead is present. These tests rapidly indicate if lead has been detected on the tested surface and are useful for immediate, on-site identification of the presence of lead. However, field tests do not tell you how much lead is on the surface.
- **Wipe tests (laboratory analysis):** These tests often involve framing a sample area of a surface with a template or tape, wet wiping the sample area and sending the wipe to a laboratory for analysis. These tests are useful for determining the amount of lead in the sample area, but results are not immediate. These tests require specific processes to be followed to ensure the results are accurate and meaningful.

An expert (e.g. an occupational hygienist) can assist you to determine the most appropriate testing method for your circumstances.

4. How can I use surface lead testing?

Surface lead testing can be used to identify lead contamination in the workplace and support risk management, including determining the effectiveness of existing control measures in managing lead exposure risks for workers.

Examples of how surface lead testing can be used in the workplace

Surface lead testing can be used to:

- identify if lead process areas and other areas that are likely to be contaminated with lead (e.g. changing rooms where workers remove their uniforms) are being cleaned properly
- determine if the control measures being implemented are effectively managing risks, such as if engineering controls are suppressing lead dust at the source so it does not settle on surfaces
- identify if lead is present in work areas it should not be, such as if lead dust has been transferred from production areas to shared kitchens or office spaces, and
- determine the adequacy of work undertaken to remove lead from a work area following an identified contamination.

Surface lead testing can only confirm whether there is lead present on the specific surface tested. Surface lead testing cannot determine the source of the lead contamination or indicate if there is lead on other surfaces or in other work areas.

A test result which indicates lead is not present on a surface in isolation does not indicate there is no lead exposure risk to workers and does not solely demonstrate compliance with WHS duties.

5. Can surface lead testing be used to determine lead exposure?

No – surface lead testing cannot measure an individual's exposure to lead. It can be used alongside other types of exposure assessments to estimate how much lead workers are potentially being exposed to; however it must not replace workplace air and health monitoring programs or be solely relied on in the determination of whether a lead process is lead risk work.

6. Considerations when conducting surface lead testing

Surface lead testing can be undertaken by PCBU's or workers; however, you may wish to consider outsourcing testing externally (e.g. to an occupational hygienist) especially when performing wipe tests which require more stringent protocols to be followed.

Where workers are performing surface lead testing, you must ensure they are provided with the appropriate information, training, instruction and supervision on how to safely and reliably perform the test. You must also ensure they are provided with any necessary equipment, including personal protective equipment (PPE).

When surface lead testing is being conducted, you will need to take steps to ensure the tests are being performed in a way which generates accurate results. This includes ensuring proper:

- sample collection, such as being consistent with how samples are taken and preventing cross contamination
- sample handling, such as handling the wipe used to collect a sample in a way that does not compromise the sample
- interpretation of results, such as being aware of how results will be presented (i.e. a colour change), what those results mean and when results require you to act, and
- sample disposal, such as ensuring contaminated samples are disposed of in a way that does not pose risk to others.

You will need to follow the sampling instructions and testing protocols provided with the test. To assist you with accurate sample collection and analysis you can also follow established procedures such as those outlined in Appendix C of [AS/NZS 4361.2 – Guide to Lead Paint Management](#) or in the [NIOSH Method 9102: Elements on Wipes](#).

An expert (e.g. an occupational hygienist) can provide advice on how to appropriately conduct surface lead testing, including what testing protocols you should follow and what results may mean for your workplace.

7. What should I do if lead is detected?

If lead is detected on a surface that has been tested, you will need to determine the immediate risks to workers who may have had, or will have, contact with the contaminated surface and act accordingly. This includes safely cleaning and decontaminating the area where lead was detected and retesting to confirm removal. It may be necessary to limit or fully remove access to the area where lead was detected until you have addressed any risks which may be present. You may also need to conduct further testing to determine if any other surfaces or work areas are contaminated.

Undertaking a risk assessment, or reviewing your existing one, will help you to better understand how the lead contamination occurred and to implement control measures to prevent it from happening again.

Your risk assessment will help you to:

- identify which workers are at risk of exposure to lead
- determine what sources and processes are causing the lead contamination
- identify if and what kind of control measures should be implemented, and
- check the effectiveness of existing control measures.

Next steps could include:

- implementing additional control measures to protect workers, and
- providing workers with information and where required, training on lead risks and the control measures implemented to manage them.

You must consult with workers and their health and safety representatives (HSRs), if any, when assessing risks and making decisions about next steps, including implementing additional control measures.

Case study: Surface lead testing in a shared kitchen

Sam's workplace conducts activities which are classified as lead risk work. The workers undertaking lead risk work are subject to an appropriate health monitoring program which includes regularly checking their blood lead levels.

The workplace is checking the effectiveness of the control measures implemented to manage the risks of workers being exposed to lead. This includes checking that lead contamination is being confined to the lead process area at the workplace.

Sam conducts field tests on the tables in the shared kitchen of their workplace. Some tables immediately test positive for lead. Sam is concerned as they know lead can be ingested through hand-to-mouth actions and workers may be touching the contaminated tables whilst eating, increasing their risk of exposure to lead. Sam also knows the positive test results indicate that existing control measures are not effectively managing risk.

Sam closes the shared kitchen and organises an alternative spot for workers to eat so wipe tests can be undertaken to determine how much lead is present in the kitchen, and the contaminated surfaces can be safely cleaned and decontaminated. Sam also arranges for further field tests to be conducted to check if other work areas are contaminated with lead. Sam identifies there is also lead contamination in the bathrooms.

Sam reviews the risk assessment to determine what sources are causing the lead contamination and identifies workers are bringing lead dust into the shared kitchen and bathroom via their contaminated work clothes and boots.

In consultation with workers and their HSRs, Sam introduces new policies to minimise the risk of lead dust contaminating the shared kitchen and bathrooms. This includes making it clear that workers must remove dirty work clothes and PPE before leaving the lead process area. In addition, Sam introduces specific policies for the shared kitchen which requires workers to:

- practice good hygiene, including cleaning hands and any exposed skin with appropriate lead removing soap or wipe before preparing and eating food, and
- wipe down surfaces in the kitchen with an appropriate lead removal wipe before and after they are used to ensure they are clean, including prior to preparing food.

To ensure workers understand the new policies, Sam organises for workers to receive training and puts up signage in the shared kitchen to remind them of their responsibilities.

Sam performs follow up field tests and determines the additional control measures have been effective in minimising the risk of lead dust entering the shared kitchen and bathroom.

For further information on lead in the workplace see the Safe Work Australia website at www.safeworkaustralia.gov.au, or contact your local WHS regulator for advice relevant to your jurisdiction.