

LEAD

Lead is a heavy metal which is mined. It can combine with numerous other substances to form various lead compounds.

How And Why Is Lead Used?

Lead compounds have a wide variety of uses, especially as paint pigments, and in storage batteries, welding rods, and ceramics. Certain metal alloys may also contain a small percentage of lead. Some of the properties lead has that makes it useful include high density, softness, low melting point, and resistance to corrosion.

Who Is Potentially Exposed To Lead?

Occupational exposure to lead may occur when carrying out operations and tasks such as spray painting with lead-containing paints, welding or soldering using lead-containing welding rods or solders, grinding on surfaces previously painted with a lead-containing paint, and handling chemicals containing lead.

The company uses very little lead-containing materials; where possible, such materials have been replaced with non-lead containing compounds. There may be older structures at the company where lead-containing paint may have been used. This does not present a health risk until it is necessary to grind, sand, or otherwise disturb the paint.

Environmental exposures to lead can also occur via air (e.g., crude oil refining and smelting), soil (due to contamination from paint chips and gasoline), and water (due to contamination from corrosion of lead pipe, fixtures and lead solder).

How Is Lead Exposure Evaluated?

First we determine whether lead is contained in the materials we are using, including paints, welding rods, and metal alloys. We do this by referencing MSDS, labels, or in the case of previously painted surfaces (where we may need to grind, cut, or weld), test the material for lead content.

Where lead is identified in a material, then personal air sampling is conducted. This is carried out by having representative potentially exposed employees wear a monitoring device which collects air, capturing (via a filter) any lead which may become airborne and enter the employee's breathing zone. The filter is then sent to a laboratory where it is analyzed for lead content.

Personal air sampling results are compared to the OSHA permissible exposure limit (PEL) of 50 micrograms of lead per cubic meter of air ($50 \mu\text{g}/\text{m}^3$) and an action level of $30 \mu\text{g}/\text{m}^3$, both of which are based upon an 8-hour work day. For those working 12-hour work shifts, the PEL is reduced to $33 \mu\text{g}/\text{m}^3$ with an action level of $20 \mu\text{g}/\text{m}^3$. The action level "triggers" certain requirements such as medical surveillance, including blood testing; periodic air monitoring; and education/ training programs. It should be noted that such lead exposure levels would not be expected with the limited lead usage within the company.

When blood testing is required (airborne concentrations above the action level), then the blood-lead levels are compared to an OSHA limit of 40 micrograms of lead per deciliters of blood ($40 \mu\text{g}/\text{dl}$). If blood-lead levels exceed this concentration, then the employee must be removed from the lead exposed area until blood-lead levels drop below $40 \mu\text{g}/\text{dl}$.

How Does Lead Affect The Body?

Lead can enter the body through inhalation (breathing) and through ingestion (eating). Very small amounts of lead may be unintentionally ingested via eating, drinking or smoking on the job where lead compounds are in use. Once lead enters the body, it enters the blood stream. Some of the lead is quickly filtered and exited from the body while some may accumulate in the blood, bones and internal organs, including the kidneys, brain and liver. It can remain stored in the bones for a long period of time. Lead detection in blood is an indication that a recent exposure has occurred and that lead is accumulating in the body faster than it is being eliminated.

Early signs and symptoms of lead poisoning (due to repeated overexposure) are non-specific, but resemble flu-like symptoms. Cumulative (repeated exposures over time) exposure to lead may result in damage to the blood, nervous system, kidneys, bones, heart and reproductive system, and contributes to high blood pressure. Damage is expressed by effects which include poor appetite, irritability, numbness, metallic taste in the mouth, muscle and joint pain, sleeplessness, weakness, nausea, fine tremors, "lead line" on the gums, "wrist drop" (weakness of extensor muscles), and reproductive difficulty. An unborn child may also be affected when the pregnant woman is exposed to excessive levels of lead.

What Is the Company Doing To Minimize Exposures To Lead?

Wherever possible, lead-containing materials (e.g., paint) have been replaced with lead-free materials. Where such substitution is not feasible (e.g., some welding or soldering operations), then local ventilation is used to draw fumes, dusts or mists away from the breathing zone.

Where grinding, sanding, or cutting must occur on surfaces containing lead-based, then special controls shall be put in place prior to disturbing the material. If needed, projects are contracted to an independent contractor, specializing in lead abatement, who have been trained in the hazards and control of lead, including safe work practices.

What Can You Do To Minimize Exposures To Lead?

Only use materials which have been approved by the company for use at your facility. Purchasing materials (including small cans of spray paint) from a local store without approval could result in you and co-workers being exposed to lead or some other hazardous material.

If you are using a lead-containing material, be sure that you and your co-workers follow proper procedures which have been put in place for your protection:

- Immediately report to your supervisor any problems with your local ventilation system.
- Eat, drink, or smoke only in designated areas outside the area where lead-containing materials are in use.
- Wash hands and face before eating, drinking, smoking, or applying cosmetics.
- Keep the worksite clean using only vacuums with a HEPA filter or wet cleaning methods when removing lead dust.