LEGACY LEAD DUST FROM PIPE DOPE

About this Guide

Unifor Local 975 created this guide in partnership with OHCOW to address health effects, prevention strategies, reporting and claims initiation for workplace exposure to lead dust.

Legacy Lead Dust From Pipe Dope is directed to all those supporting and protecting lead-exposed workers including:

- Fellow workers: past, present and future
- Employers • Managers • Supervisors
- Joint Health & Safety Committee (JHSC) members
- Health and safety representatives
- Workplace union representatives

Unions, employer associations, and health and safety professionals may also find this information useful.

UNIFOR Local 975

OHCOW Occupational Health Clinics for Ontario Workers Inc.

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INTRODUCTION

Why is this guide necessary?

Lead has no biological purpose in our bodies.

It is now known that relatively low blood lead levels, even as low as 0.24 µmol /L (5 ug/ dL), can affect our health. This is well below the levels where Ontario health and safety regulations require removal from work involving lead exposure, which are 1.0 µmol /L (20 µg/ dL) and 0.5 µmol /L (10 µg/ dL) for the general population and for women who are pregnant or of childbearing potential respectively.

Of particular concern is that elevated blood lead is known to adversely affect reproductive health, pregnant women, and children.

Children are extremely vulnerable to low lead exposure.

This guide has been developed to raise awareness about "elevated blood lead" and provide guidance about what you can do about it.

What can you do immediately?

1. Report your concerns to your supervisor and your health and safety representative. Work with your health and safety representative to help implement recommendations (see pp. 9-11).
2. If you have symptoms or health effects that you think are related to lead exposure (see pp. 5,6), you can tick them off in the booklet and bring it to your Medical Surveillance provider and/or your family doctor. Additionally, fill out a Worker's Report of Injury/Disease (Form 6) (see p. 12), and submit it to the Workplace Safety and Insurance Board (WSIB).
3. If you do not have symptoms or health effects (see pp.5,6), but you think you have been exposed to lead, fill out a Worker's Exposure Form (PEIR Form) (see p. 17) and submit it to WSIB.

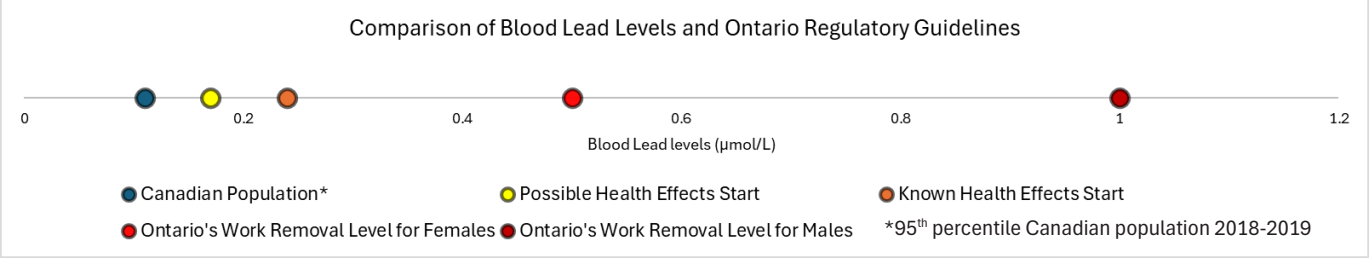


Fig 1. The average blood lead level (in µmol/L) of the Canadian population (0.11), the blood lead level where possible health effects occur (0.17), the blood lead level of where known health effects occur (0.24), and the blood lead level of being removed from work in Ontario (0.50 or 1.0). This graphic shows that the possible health effects and known health effects of blood lead levels are significantly lower than Ontario's work removal level.*

**Information on human biomonitoring of lead in Canada with results from the Canadian Health Measures Survey.*

Most important workplace actions

1. Ensure programs are in place to eliminate lead exposure including cross-contamination.
2. Ensure adequate measures are in place to prevent take-home lead, and cross-contamination into your personal vehicle and home.
3. Blood lead monitoring and scanning of bone using x-ray fluorescence.
4. Good personal hygiene practices to reduce exposure.

The Source

Many workers and contractors within the Natural Gas Distribution, Utility, Heat, Ventilation and Air Conditioning (HVAC), as well as numerous other industries have traditionally used a thread and gasket sealant with the tradename,"Masters Metallic Compound." *Masters Metallic Compound contains over 80% lead (Pb) (CAS 7439-92-1) concentration by weight – which can make it an extremely hazardous product to the health of workers, their families and especially children.

*Masters Metallic Compound can also be found in industries and systems that use: Acids, Air (compressed, gaseous), Aliphatic Solvents, Alkalis, Ammonia, Brine, Butane, Castor Oils, Caustic Alkali, Carbon Dioxide, Diesel Fuel Oil, Gasoline, Glycol, Heating Oils, Helium, Hydraulic Oils, Hydrocarbons, Inert Gases, Jet Fuel (JP4,5 & 6), Kerosene, LPG, Manufactured Gases, Methanol, Mineral Oils, Nitrogen, Petroleum Solvents, Propane, Refrigerants, Steam, Sugar, Water (non-potable).

Applying Masters Metallic Compound

Masters Metallic is used the same as any other pipe dope.

1. Clean the threads of the pipes, fittings, and/or equipment to be connected.
2. Apply the compound to sections of pipes, fittings, and/or equipment to be connected with the use of a brush (if available).
3. Tighten connections between the components using wrenches and other tools.
4. Clean up excess compound if necessary.

How does Masters Metallic Compound expose workers to lead?

Every stage of the application and removal of Masters Metallic Compound creates opportunities for exposure and cross-contamination. This remains true even though the company stopped using it in 2020. Exposure will continue for years and possibly decades, since it was used on pipes, fittings, and equipment over the course of decades.

Whenever workers take apart connections where Masters Metallic was applied prior to 2020, and especially when cleaning the threads of any components that will be re-used, there is the potential for airborne dust and fumes.

There is also the certainty of dust / dried paste coming into contact with work surfaces, tools, clothing and personal protective equipment (PPE) through direct contact along with the possibility of cross-contamination to other tools, skin, work vehicles, other clothes, other vehicles and eventually the home.

The danger arises from this contamination and cross-contamination exposure through ingestion. Contaminated hands will lead to ingestion of lead while eating, wiping sweat, touching the face, touching cigarettes, biting nails, etc.

The risk of ingestion is increased in the absence of effective handwashing and/or inadequate time for clean-up, and cross-contamination of the hands can happen at any time from any contaminated surface or object, including the improper removal (doffing, or taking off) of PPE.

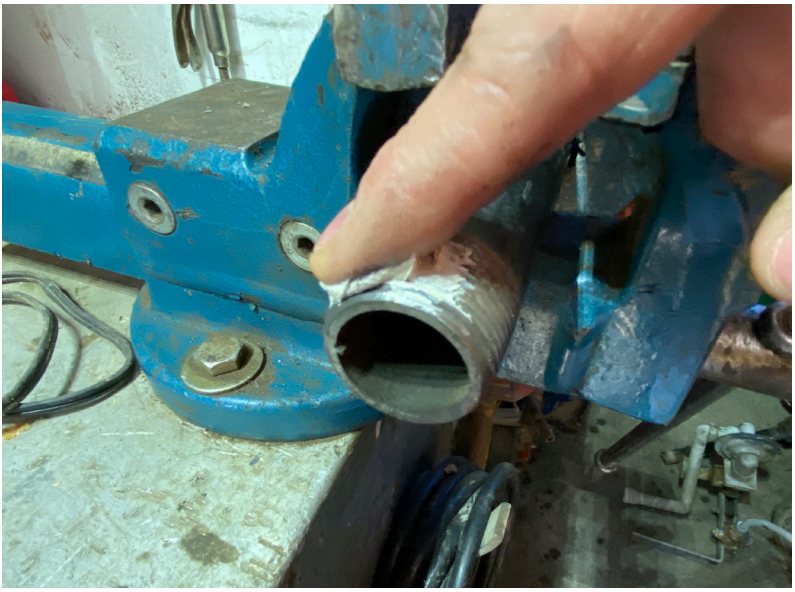
Employers often claim that providing disposable gloves as personal protective equipment (PPE) is sufficient to protect worker health from lead exposure. Aside from the risk of inhalation exposures, gloves are only effective to the extent that they are used properly following training in donning (putting on), doffing (taking off) and disposal.

Historically, gas fitters were exposed not only to dust and dried paste at the time of removal, but also to the wet Masters Metallic paste at the time of application with bare hands.

Worse, the compound was often applied directly with bare hands rather than with a brush. This remains a bad practice with non-lead-based sealants. Historical exposures using these work practices should be detailed in reports of exposures and/or health effects to the WSIB.

It is important to note PPE is the last line of defense and the least effective control. It should not be the only control employers use to protect workers that have exposure to *Masters Metallic Compound*.

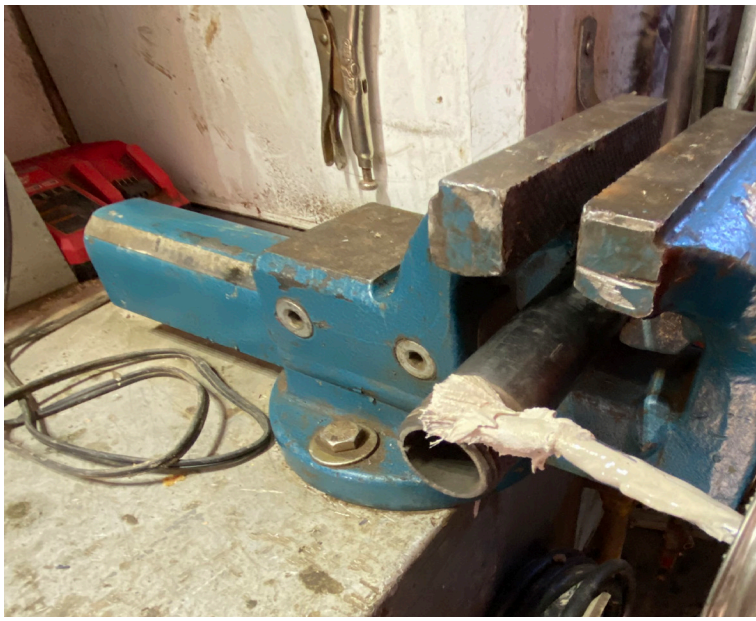
See below the incorrect application of thread sealant. Never use your body parts.



Even if gloves are used properly, hands can always be contaminated through cross-contamination. Examples of where this can happen include (but are not limited to):

- Employee lockers, clothing storage areas and vehicles
- Washrooms and hygiene areas
- Washing and drying machines
- Office equipment including desks, chairs, and workstations
- Shelving and racking where Masters Metallic Compound was stored
- Used Personal Protective Equipment (hard hats, reusable gloves, safety glasses, hearing protection, coveralls, etc.)

See below the correct application of thread sealant.



- Uniforms, work boots, worker's hands
- All touchpoints in vehicles including steering wheels, dashboards, and door handles
- Tailgates and floors
- Work benches, work vices, and pre-assembly areas
- All used or reused steel pipes and fittings
- Tool and equipment storage
- Hand tools
- Personal items (keys, phones, lunchboxes)

What can I do to prevent cross-contamination in the workplace?

As the above examples make clear, truly effective prevention of cross-contamination requires an effective program that includes everyone, but here are some actions you can take on your own.

1. Ensure the correct "putting on" and "taking off" of personal protective equipment (PPE) (e.g. nitrile gloves). Double gloves may be more effective.
2. Participate in training on the correct use of PPE and request training if not provided.
3. Ensure that enough time is allocated for clean up throughout and at the end of the day.
4. Report to your supervisor and health and safety representative any incident involving unexpected or unprotected lead exposure that may lead to elevated blood lead levels.
5. Actively participate in the blood lead reduction program including blood lead monitoring.
6. Report concerns about lead exposure of family members to your joint health and safety committee (JHSC)/Health and Safety Representative along with any relevant information (such as blood lead levels).

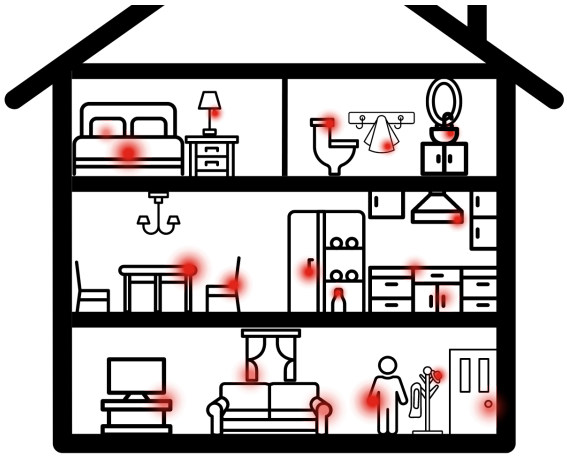
Why is take-home exposure to lead dangerous?

Preventing take-home exposure is critical. Family members can be exposed to contaminated items brought home from work.

Young children are particularly vulnerable to lead poisoning because they absorb 4–5 times as much ingested lead as adults from a given source.

Worker entering their house in work clothes. The following picture can result in exposure to their family.

Contaminated hands can spread lead across an entire house.



This can also occur from the touchpoints in your work vehicle. See the picture below.

How can I prevent take-home exposures?

Effective workplace measures to prevent take-home exposures are:

1. Reducing exposure in the workplace.
2. Changing clothes before going home and leaving soiled clothing at work for laundering.
3. Storing street clothes in areas separate from work clothes.
4. Showering before leaving work.
5. Prohibiting removal of toxic substances or contaminated items from the workplace.

The National Institute for Occupational Safety and Health (NIOSH) notes that preventing take-home exposure is critical because decontaminating homes and vehicles is not always effective.

Not only are normal house cleaning and laundry methods inadequate, but decontamination can also expose the people doing the cleaning and laundry.

HEALTH EFFECTS OF LEAD

The toxicity of elevated blood lead, even at levels previously considered safe, can affect many organ systems.

Lead is recognized as a designated substance under Ontario's Designated Substances Regulation.

Companies using lead are required to have a lead control program and a medical surveillance program.

Lead exposure via hand-mouth contact and ingestion must be controlled along with controlling airborne lead.

If you have any of the following symptoms or health effects, take this to your Medical Surveillance provider and/or family doctor. Consider starting a WSIB claim (p.11).

Place a checkmark in any of the symptom or disease boxes that may apply to you.

☐ ***ACUTE POISONING***

Acute lead toxicity is characterized by symptoms of abdominal pain/colic, vomiting, constipation, peripheral neuropathy, and cerebral edema and encephalopathy, which can lead to seizures, coma, and death.

CHRONIC POISONING SYMPTOMS

People with chronic lead poisoning may have no symptoms or nonspecific symptoms that are not immediately recognized as being associated with lead exposure. These symptoms include:

- ☐ Muscle aches or pain
- ☐ Joint pain
- ☐ Loss of appetite
- ☐ Weight loss of 10 lbs or more without dieting
- ☐ Nausea/vomiting
- ☐ Unusual taste in mouth/change in taste of food
- ☐ Abdominal cramping/pain
- ☐ Constipation
- ☐ Headaches
- ☐ Numbness and/or tingling sensation
- ☐ Sleeplessness
- ☐ Whole body muscle weakness
- ☐ General fatigue/lethargy
- ☐ Depression
- ☐ Irritability
- ☐ Nervousness
- ☐ Change in personality
- ☐ Trembling
- ☐ Difficulty concentrating
- ☐ Impairment of short-term memory
- ☐ Loss of libido (sex drive)
- ☐ Partial or total impotence (men)
- ☐ History of infertility
- ☐ History of adverse reproductive outcomes
- ☐ Irregular menstruation (women)
- ☐ History of blood pressure lability (extreme fluctuations)

EFFECTS of CHRONIC EXPOSURE to LEAD

Toxic effects of lead exposure have been observed in *every organ system*.

Have your family doctor go through the following checklist with you.

☐ ***Neurological (Nerve) Effects.***

Children. Decreased cognitive function; altered mood and behaviors that may contribute to learning deficits, altered neuromotor and neurosensory function, peripheral neuropathy, and encephalopathy.

Adults. Decreased cognitive function including attention, memory, and learning; altered neuromotor and neurosensory function; altered mood and behavior; and decreased peripheral nerve conduction velocity.

☐ ***Renal (Kidney) Effects.***

Decreased GFR, proteinuria, enzymuria, impaired tubular transport, and histopathological damage.

☐ ***Cardiovascular (Heart, Arteries, Veins, Capillaries) Effects.***

Increased systolic and diastolic blood pressure, increased risk of hypertension, atherosclerosis, altered cardiac conduction, increased risk of heart disease, and increased mortality due to cardiovascular disease.

☐ ***Hematological (Blood) Effects***.

Inhibition of δ-ALAD leading to decreased blood hemoglobin andanemia, decreased activity of other erythrocyte enzymes, and altered plasma erythropoietin (EPO) levels.

☐ ***Immunological (Immune) Effects.***

Perturbation of humoral and cell-mediated immune systems, decreased resistance to disease, sensitization, autoimmunity, and inflammation.

☐ ***Reproductive Effects:***

Males. Effects on sperm, alterations in semen quality, decreased fertility, histopathological damage to the testes, and possible altered serum concentrations of reproductive hormones.

Females. Possible alterations in serum concentrations of reproductive hormones, decreased fertility, spontaneous abortion, preterm birth, and earlier age at the onset of menopause.

Developmental Effects. Decreased birth weight and size, decreased anthropometric measures in children, and delayed onset of puberty in males and females.

☐ ***Other health outcomes associated with lead (Pb) include the following:***

☐ ***Respiratory Effects.***

Decreased lung function, increased bronchial hyperreactivity, increased risk of asthma, and obstructive lung disease.

☐ ***Hepatic Effects.***

Possible increases in plasma liver enzymes and cholesterol, enlarged liver, and increased thickness of gall bladder wall.

☐ ***Endocrine Effects.***

Possible alterations in serum of thyroid hormones, altered cortisol responses, alteration in serum growth factors, and decreased serum vitamin D levels.

☐ ***Gastrointestinal Effects.***

Abdominal pain/colic, nausea, vomiting, and diarrhea and/or constipation.

☐ ***Musculoskeletal Effects.***

Bone loss, osteoporosis, dental caries, tooth loss, and periodontitis.

☐ ***Ocular (Vision) Effects.***

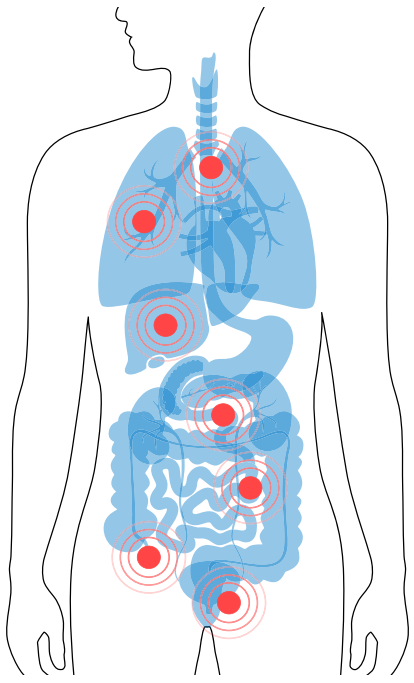
Possible macular degeneration and cataracts.

☐ ***Aural (Hearing) Effects.***

Hearing impairment.

☐ ***Cancer.***

Increased risk of cancer, including all cancers, cancer of the respiratory tract, intestinal tract, and larynx, and glioma.



HIERACHY OF CONTROLS

Lead control programs must use all levels of control in the hierarchy of controls.

It is always best to control or contain lead "at the source" rather than remedy the situation after contamination.

The hierarchy of controls is a way of determining which actions will best prevent exposures.

The hierarchy of controls has five levels of action to reduce or remove hazards.

The preferred order of action based on general effectiveness is:

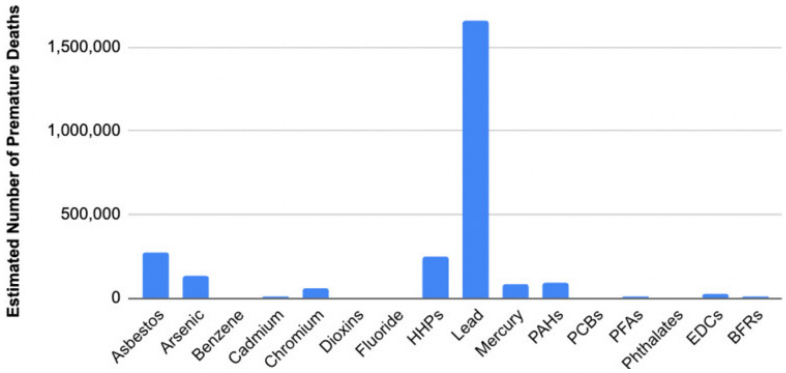
1. Elimination
2. Substitution
3. Engineering controls
4. Administrative controls
5. Personal protective equipment (PPE)

Using this hierarchy can lower worker exposures and reduce risk of illness or injury.

Recent literature raises the level of concern.

The literature on health effects of lead in humans is growing rapidly, with many epidemiological studies of workers as well as the general population, including children. Many epidemiological studies have prompted growing attention to the adverse health effects of lead exposures that result in blood lead concentrations of less than 0.5 µmol /L (10 µg/dL).

Exposure to lead is associated with toxicity to every organ system. Lead is widely distributed throughout the body and has been measured in all tissues. For all organ systems, toxicity has been observed at blood lead levels less than or equal to 0.5 µmol / L.



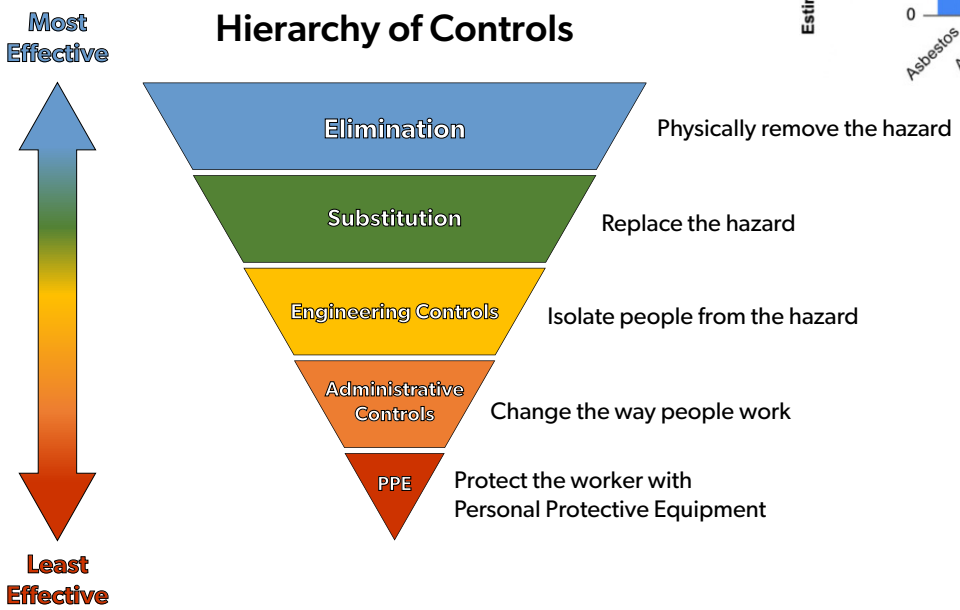


Figure- Concern at the global level continues to grow. A study on the impact of global chemicals of concern found that lead surpasses the others by a large margin with an estimated median value of 1.7 million deaths annually. The figure above provides a visual representation of the estimated number of premature deaths associated with exposure to various environmental chemicals.

THE LEAD PROGRAM GAPS

In 2020, the Ministry of Labour, Immigration, Training and Skills Development, ordered the company to develop a lead surveillance program. This led to a Lead Management program (with procedures) and a Medical Surveillance Program. There is much more that can be done to address remaining gaps.

Control program components work together. Missing or broken parts can render the whole system ineffective.

Both the company and workers must commit to the Lead Control Program.

If deficiencies are not fixed, the health of the worker and families may suffer in ways that are not immediately obvious, but creep up over time.

Gaps to address include, but are not limited to:

1. Laundering Program

- A laundry program is provided, however, it is not effectively monitored or managed to ensure compliance and proper usage.
- Furthermore, the lack of service quality from vendors has diminished participation in the laundering program.

2. Medical Monitoring Program

- There is limited participation in the Medical Surveillance Program.
- There is limited distribution of information about the Medical Surveillance Program.
- The program should provide for preplacement, periodic and exit examinations as part of the Medical Surveillance Program. It is important that all workers are encouraged to participate in lead in blood monitoring medical surveillance.
- Employees that sign up for the program should have regular communication from the employer and third-party program facilitator. Ongoing follow up should be maintained to ensure a reduced blood lead level.
- The blood lead results must be provided to the worker. There should also be an overall assessment of blood lead levels and interpretation via the lead management program including trend lines to show continuous improvement as well as identifying areas of concern (e.g. woman of reproductive potential).

What gets measured gets noticed. What gets noticed gets action. It is extremely important that workers enroll to have blood lead measured routinely. Results from the lead in blood program can then be used to evaluate the effectiveness of the programs developed to monitor and drive exposure reduction. In addition to lead in blood as the primary measure of exposure risk, lead in bone should be measured to understand chronic exposures and longer-term body burden.

3. Housekeeping and surface testing of vehicles

- Testing is not being conducted on lead exposed vehicles every quarter of the year as per program.
- All lead exposed vehicles are not being cleaned bi-annually as per program –this is not adequately tracked, with ongoing reporting to JHSC or Union.
- Time is not being scheduled for daily cleaning of lead-contaminated vehicles and equipment – These activities are not being tracked, reported on, or verified as being completed daily.
- There is no verification of the effectiveness of vehicle cleaning by surface testing conducted following scheduled cleanings or sample exceedance cleanings.

4. Housekeeping and surface testing of facilities

- There is limited lead surface testing and lead cleaning for all facility/depot surfaces that may be cross contaminated.

5. Safe handling procedures

- Management must monitor and ensure all procedures are being followed in the workplace and audit compliance with all elements of the program.

6. Take-home exposure risks must be adequately controlled

- Current lack of a clean-in /clean-out program developed with lockers, apparel, and shower facilities must be remedied. Introduce clean-in / clean-out processes.

7. Retirees

- The current program does not include workers who are retired and that were exposed to lead for many years.

Recommendations to the Employer for Lead Program Gaps

Below is a list of improvements that should promptly be implemented to control the hazards identified in this workbook to improve worker safety and company compliance. This should all be done in consultation with the Joint Health and Safety Committee (JHSC) and Union Health and Safety Representative.

1. Governance, compliance, and oversight

- Maintain a dedicated task force team and budget to improve the management of current Lead Management Programs taking the recommendations below into consideration.
- Annually audit quality and promptly address any recommendations, identified hazards, breakdowns in controls, or non-compliance items.
- Review, re-assess, and improve where there are gaps or non-compliance with the Lead Management program in consultation with the JHSC and Union.

2. Laundering Program

- Make participation in the Laundering Program mandatory.
- Adequately report on Laundering Program participation to JHSC and Union.
- Ensure service quality issues are adequately resolved in consultation with JHSC and Union.

3. Medical Monitoring Program

- Ensure a medical monitoring program is in place and **obtain the commitment from all workers**. What gets measured gets noticed, what gets noticed gets action.
- Update program to provide targets for blood lead levels that are less than 0.24 µmol /L (5 µg/dL) for all workers and less than 0.24 µmol /L (5 µg/dL) for all workers and less than 0.17 µmol /L (3.5 µg/dL) for women who are or may become pregnant.
- Share with JHSC and Union any aggregated information on participation, blood lead levels and test dates, job titles, work locations, and any other relevant information including results from XRF lead in bone measurement.
- Work in consultation with JHSC and Union to analyze and report on trends to identify exposures and potential breakdowns in the lead management program controls OR occupational illnesses.
- Foster a culture of trust and transparency to ensure workers are willing to participate in the Medical Monitoring Program.
- Make a goal of at least 75% enrollment rate for lead-exposed workers.
- Maintain worker, former employee, and retiree access to the Medical Monitoring Program and K-Shell Testing.

4. Sampling of vehicles and facilities

- Ensure JHSC worker representative is present during all surface testing.

- Sample vehicles on a quarterly basis and promptly report results to JHSC and Union.
- Ensure samples of vehicles and facilities are taken after bi-annual cleaning and/or surface clearance exceedance cleaning.
- If there is a surface level exceedance, ensure vehicle or facility is cleaned and re-tested and that effected parties are notified of the exceedance.
- Ensure the sampling and monitoring of airborne lead and surface lead exposures is happening with different job tasks.
- Develop a reporting mechanism to ensure compliance with program requirements.
- Develop and share a system to identify trends with sampling results including multiple exceedances for vehicles, repeat failures over time, areas with consistent and repeated exposure, etc.
- Share system with JHSC and Union.
- Create an Action Level document, so that company leaders and workers know the appropriate actions to take based on the level of exceedance found during sampling.

5. Safe work and housekeeping procedures

- Schedule, track, and enforce dedicated time for workers to clean hands, tools, equipment and "high contact" surfaces in vehicles after all work tasks or at the end of a shift.
- Develop, schedule, and track cleaning of "high contact" surfaces in facilities (e.g., locker handles, doorknobs, washroom facilities, muster rooms, desks, etc.) using either lead removal wipes or lead removal soap.
- To determine the effectiveness of hand washing to remove lead residues: Individuals exposed to lead can use a lead wipe kit prior to eating, drinking, or smoking, and at the end of the workday to ensure lead has been completely removed from their hands and other body parts during washing. By demonstrating the effectiveness (or lack thereof) of washing for removal of lead residues, individuals are better able to prevent skin contamination and hand mouth contact. This process also provides an instant result whereas the on-the-spot color change provides immediate feedback to exposed workers on the importance of adequate hand washing. Full Disclosure wipes provided by SKC for example provides these tests along with a test method https://www.skcinc.com/products/full-disclosure-wipe-kit-for-lead-qualitative
- Provide lead-removal soap (or lead-removal wipes when no lead-removal soap and water are available) in the employee locker room, as standard soap is not adequate to remove lead residue.
- Effective Laundry program with metrics, including reporting usage, ensuring daily use, and correcting deficiencies in program promptly. Quarterly review on program usage.
- Wash and dry work clothes alone and not with any other clothes. Use a lead-removal detergent and store them away from other clothes.

6. Training

- Update and reinforce awareness on the hazards of lead, and the health effects based on the most up to date literature.
- Provide lead health hazard training upon hire for everyone and annually thereafter- online modules should be supplemented with in-person training every second year.
- Provide training on all components of the Lead Management Program, including relevant standards and procedures on a yearly basis.

7. Substitution

- When replacing higher risk hazardous substances including lead; Control banding provides a method that can be used to determine whether the product is in fact safer. Control banding can be used as part of a chemical review and approval risk assessment procedure prior to bringing and using chemicals onsite. A description

and tools that assist in control banding are available on OHCOW's website here, https://www.ohcow.on.ca/occupational-illness/prevention/hazard-and-control-banding/

8. Take-home exposure

- Develop clean-in/clean-out processes required for all operations facilities that have/had cross contamination of lead in their workplace or on apparel, vehicles, tools, and equipment.
- Workplace measures effective in preventing take-home exposures are (1) reducing exposure in the workplace, (2) changing clothes before going home and leaving soiled clothing at work for laundering, (3) storing street clothes in areas separate from work clothes, (4) showering before leaving work, and (5) prohibiting removal of toxic (designated) substances or contaminated items from the workplace. For more information visit NIOSH HHE https://www.cdc.gov/niosh/hhe/reports/pdfs/2019-0192-3377.pdf.
- Change clothes and shoes before going home, and leave dirty clothes and shoes at work for cleaning.
- Have clothing lockers in separate rooms for street clothing and work clothing.
- Have time for showering and clothing change before the end of the work shift.

9. Current workers, past workers, and retirees

- Develop provisions to research, study, and communicate with workers that may have been exposed to lead in the workplace.
- Work with the union, industry partners, and others to understand current and future exposures and potential unidentified illnesses.
- Work with Unifor Local 975 to understand the extent of lead exposure and any research including measuring lead in bone to better inform workers about longer term exposure as an indicator for chronic health effects.
- Work with retirees and workers to understand blood lead and X-Ray Fluorescence results.
- Collaborate with researchers in Ontario and New York to make x-ray fluorescence (portable) analysis for lead in bone available in Ontario.
- Analyze blood lead sampling data and provide trends to better understand how exposure to lead can be continuously reduced.
- Seek new approaches, new processes and new techniques to understand the impact of Masters Metallic use on workers' health.

10. Women

- The current goal of workplace lead exposure management should be to ensure all workers' blood lead levels are less than 0.50 µmol /L (10 µg/dL). In the case of women who are or may become pregnant, it is even lower at less than 0.17 µmol /L (3.5 µg/dL).
- In the case of women who are or may become pregnant, the aim should be to maintain blood lead levels at less than the CDC reference level for lead (currently 0.17 µmol/L, equivalent to 3.5 µg/dL). This is necessary to prevent harm to fetuses.

Family members

If there are concerns about family members, especially babies and children, ask for a blood lead level test referral from your family doctor. Test results can then be compared with the levels in the general population according to the Government of Canada.

https://health-infobase.canada.ca/biomonitoring/index.html

HOW TO INITIATE A WSIB CLAIM

If you have symptoms or health effects that you think are related to lead exposure, you can tick them off in this booklet (see pp. 5-6) and bring it to your medical surveillance provider and/or your family doctor. Also, fill out a Worker's Report of Injury/Disease (Form 6), and submit it to the Workplace Safety and Insurance Board (WSIB).

If you have been exposed to lead but have no symptoms or diagnosis, fill out a PEIR (Program for Exposure Incident Reporting) form to document your exposure.

Both forms can be either mailed to WSIB or uploaded on the WSIB website.

Just because an employer established a lead management program does not mean that workers are not exposed to lead.

Form 6 (Worker's Report of Injury/ Disease)

Use a Form 6 if you believe you have been exposed to lead from the pipe sealant and its dust and have ticked off any of the lead symptoms or diagnoses in the Health Effects section.

https://www.wsib.ca/sites/default/files/2024-09/0006a_202407_workersreportofinjury_web.pdf

Key pieces to fill out on a Form 6

Some parts of the form are not relevant to lead exposure. Here is the information you should be sure to include:

- Your Contact Information
- Date of Birth
- Social Insurance Number
- Your Employer's Contact Information
- Diagnosis or Symptoms
- Occupation (Gas Technician, Gas Fitter, Labourer, Etc.)

How and when must I report a workplace injury or illness?

Your employer may try to talk you out of making a claim for workers' compensation benefits (WSIB). It might seem easier to take wages or sick pay instead of filing a claim, but it is important to do so. Workers' compensation benefits cover not only lost wages, but also medical treatments, medical equipment, and other costs you have because of your injury.

It's also important to make a claim in case your injury is permanent or gets worse in the future.

INSTRUCTIONS TO FILL OUT A FORM 6

WSIB Ontario | **Worker's report of injury/disease (Form 6)** **6**

Claim number

Visit wsib.ca/submit to submit this form and supporting documents.

A. Worker information

Last name	First name	Social Insurance Number
Address (number, street, apt., suite, unit)		Telephone
City/Town	Province / Postal code	Alternate/Cell phone
Job title/Occupation (at the time you were hurt)	Date you started with employer (dd/mm/yy)	How long have you been doing this job for this employer?
Only check if you are one of the following: ☐ executive ☐ elected official ☐ owner ☐ spouse or relative of the employer		Date of birth (dd/mm/yy)
Sex* ☐ Male ☐ Female	Your preferred language ☐ English ☐ French ☐ Other	Would an interpreter be helpful? ☐ yes ☐ no
Are you a member of a union? ☐ yes ☐ no	Do you authorize your union to represent you in this claim? ☐ yes ☐ no	If yes, do you consent to the disclosure of verbal claim file status information to your union representative? ☐ yes ☐ no
Provide your union name and local		

B. Employer information

Company/Employer name		
Address		
City/Town	Province	Postal code
Your immediate supervisor's name		Company telephone

C. Accident/illness dates and details

~~1. Date and hour of accident/Awareness of illness (dd/mm/yy)~~ ☐ AM ☐ PM ~~Date and hour reported to employer (dd/mm/yy)~~ ☐ AM ☐ PM	~~2. Who did you report this accident/illness to? (name and position)~~ ~~Telephone~~

3. Area of injury (body part) - (please check all that apply)

			Left	Right	Left	Right	Left	Right	Left	Right
☐ Head	☐ Teeth	☐ Upper back	☐ Shoulder	☐	☐ Wrist	☐	☐ Hip	☐	☐ Ankle	☐
☐ Face	☐ Neck	☐ Lower back	☐ Arm	☐	☐ Hand	☐	☐ Thigh	☐	☐ Foot	☐
☐ Eye(s)	☐ Chest	☐ Abdomen	☐ Elbow	☐	☐ Finger(s)	☐	☐ Knee	☐	☐ Toe(s)	☐
☐ Ear(s)		☐ Pelvis	☐ Forearm	☐			☐ Lower leg	☐		

☑ Other: **Lead poisoning chronic lead exposure** Are you: ☐ Left handed ☐ Right handed

4. Did the accident/illness happen on the employer's property or work site? ☑ yes ☐ no	Specify where it happened (shop floor, warehouse, client/customer site, parking lot, etc.):
5. Did it happen outside the Province of Ontario? ☐ yes ☐ no	If yes, indicate where (city, province/state, country):
6. Have you hurt this area(s) of your body before? ☐ yes ☐ no	7. Do you have any prior related WSIB/WCB claims? ☐ no ☐ yes - in Ontario ☐ yes - outside Ontario

Email accessibility@wsib.on.ca if you need a different format or accommodation. Disponible en français.

wsib.ca **Mail:** 200 Front Street West, Toronto, Ontario, M5V 3J1 **Toll free:** 1-800-387-0750 | **TTY:** 1-800-387-0050 **Fax:** 1-888-313-7373

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- Fill out Section A.
- Fill out Section B.
- Keep Section C general.
- Don't fill out #1 or #2.
- #3 Other: "Lead Poisoning Chronic Lead Exposure."
- #4 Yes.

INSTRUCTIONS TO FILL OUT A FORM 6

WSIB Ontario | wsib.ca

Claim number

Last name	First name	Social Insurance Number

C. Accident/illness dates and details (continued)

8. If you had a sudden type of accident/illness, describe your injury and what happened to cause it (e.g. hurt lower back while lifting a 50 pound box, sprained left ankle when I slipped on a wet floor, used a new cleaner and immediately got a rash). Please indicate the size, weights and names of any objects involved.

or

If you had a gradual onset type of injury, describe your injury, the work that you do and what you believe caused your injury/condition.

"Exposed to Lead Thread Sealant and lead dust cross contamination since (insert year). Within (insert years) I developed (list diagnosis or symptoms)."

9. When did you first start to have problems with this injury/condition?

10. If you did not report this to your employer right away, please tell us the reason why.

"It was a gradual onset."

11. If there were any witnesses to your accident, or if you mentioned your pain or problems to your supervisor or any of your co-workers, give us their names and positions.

	Name	Position
1	**Name workers on your Crew who know details or Leave It**	**Blank. H&S rep/Pres.**
2		

12. The Workplace Safety and Insurance Act requires your employer to give you a copy of the Employer's Report of Injury/Disease (Form 7).

Did you receive a copy of the Form 7? ☐ yes ☑ no

The Workplace Safety and Insurance Act requires you to give a copy of this report (Worker's Report of Injury/Disease - Form 6) to your employer

D. Health care information - Give your health professional your WSIB claim number

1. Did you get first aid or care at work? ☐ yes ☐ no	If yes, when (dd/mm/yy)	and by whom (name):

2. Where did you go for health care, for your injury, outside of work? (check all that apply)

	Facility/Hospital (name and address)		Date of visit (dd/mm/yy)
☐ Nursing Station		☐ Ambulance	
☐ Emergency Department		☐ Health professional office	
☐ Admitted to hospital	Date of visit (dd/mm/yy)	☐ Clinic	

3. Were you prescribed any medications/drugs? ☐ yes ☐ no	4. Were you referred for any other treatment or tests? ☐ yes ☐ no
5. Did you talk to your health professional about going back to regular or modified work? ☐ yes ☐ no	If yes, were you given any work limitations? ☐ yes ☐ no
6. Did you tell your employer you went for medical treatment? ☐ yes ☐ no	**If no, please tell your employer right away.**
If yes, when? (dd/mm/yy)	and to whom (name and position):

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PAGE 2

- #8 is key. "Exposed to Lead Thread Sealant and lead dust cross contamination since (insert year). Within (insert years) I developed (list diagnosis or symptoms)."
- #10." It was a gradual onset."
- #11. Name workers on your Crew who know details or Leave It Blank. H&S rep/Pres.
- #12. Click No.
- Fill out Section D: #1, 2, 3.

INSTRUCTIONS TO FILL OUT A FORM 6

WSIB Ontario | wsib.ca

Claim number

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Last name	First name	Social Insurance Number

E. Lost time and return to work

1. After the day of accident/illness:
   - ☐ I returned to work to my **regular job** and **did not** lose any time or pay.
   - ☐ I returned to **modified duties** and **did not** lose any time or pay.
   - ☐ **I lost time and/or pay** (e.g. regular pay, shift differential, bonuses, premiums, etc.).

   Date you first lost time and/or pay (dd/mm/yy)

2. If you lost time, have you returned to work? ☐ yes ☐ no

   If **yes**, date of your return to work (dd/mm/yy) ☐ Regular work ☐ Modified work

   If **no**, did you discuss return to work with your employer? ☐ yes ☐ no

   Does your employer have modified work? ☐ yes ☐ no

F. Earnings (do not include overtime here)

1. Rate of pay

   $ ..... per ☐ hour ☐ week ☐ other .....

2. Usual number of pay hours

   ..... per ☐ week ☐ other .....

3. If you lost time from work after the day of accident/illness, did your employer continue to pay you? ☐ yes ☐ no

4. Have you applied for, or did you receive, any other benefits (money) while off work (e.g. EI benefits, sick benefits, social services, insurance, etc.)? ☐ yes ☐ no

5. At the time of the accident/illness did you work for more than one employer? ☐ yes ☐ no

G. Declarations and signature

By signing below, I am claiming benefits under the Workplace Safety and Insurance Act, 1997, for a work-related injury or disease. I am also authorizing any health professional who treats me to provide me, my employer and the Workplace Safety and Insurance Board with information about my functional abilities on the WSIB's "Functional Abilities Form for Planning Early and Safe Return to Work".

It is an offence to deliberately make false statements to the Workplace Safety and Insurance Board. I declare that all of the information provided on pages 1, 2 and 3 is true.

Name	Signature	Date (dd/mm/yy)

☐ Check this box if you are completing and submitting this form electronically. This represents your signature. You must fill out your name and the date above.

If you are under the age of 16, your parent or guardian, must authorize the release of the functional abilities information.

Name	Signature	Relationship	Date (dd/mm/yy)	Telephone

☐ Check this box if you are completing and submitting this form electronically. This represents your signature. You must fill out your name and the date above.

Personal information about you will be collected throughout your claim under the authority of the *Workplace Safety and Insurance Act*, 1997. Your personal information will be used to administer your claim(s) and programs of the Board. Medical and non-medical information is collected from health care providers, vocational agencies, labour market service providers, employers, witnesses, Canada Revenue Agency (CRA), and others as required. Your Social Insurance Number is used to register claims, identify workers and to issue income tax statements and is collected under the authority of the *Income Tax Act*. Information may only be disclosed to the employer, external medical consultants, external service providers, researchers, third parties for cost recovery purposes and others as authorized by the *Workplace Safety and Insurance Act* and the *Freedom of Information and Protection of Privacy Act*. Your name and telephone number may be disclosed to third parties conducting satisfaction surveys and focus groups. Incoming and outgoing calls may be recorded for quality assurance purposes. Questions about this collection should be directed to the decision maker responsible for your file or by calling 1-800-387-0750

You can find a more detailed privacy statement at wsib.ca or by calling toll-free at 1-800-387-0750.

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- Fill out Section E if applicable.
- Fill out Section F.
- Sign the form.
- The online Form 6 has a box to check off when you are done. By signing this form, you're stating that the information you filled out is true.

INSTRUCTIONS TO FILL OUT A FORM 6

First and Last Name:

Date of Birth:

Phone Number:

WSIB Claim Number:

Basic statement of the facts:

"Significant lead dust surface cross contamination from Masters Metallic Compound for years that was not adequately identified by employer on designated substance hazard assessments. Lead surface testing shows high lead dust levels in trucks, facilities, and on tools and equipment. There was limited adequate controls for cross contamination and ingestion exposure for years"

"My workplace, vehicle, and tools and equipment are consistently cross contaminated with lead dust from legacy use of Masters Metallic Compound."

"The company found new sources of lead exposure that we were not aware of, i.e., new fitting containing elevated surface lead levels."

"The dried product still exists on fittings and surface testing shows high lead dust in trucks and elsewhere."

Add shift schedules, if you have them (emergency shifts, overtime, etc.). If there is a lot of overtime, it can reduce the latency for diseases.

List job tasks.

Additional Sheet

- **Attach an additional sheet** that sets out the basic facts about the nature of your job, especially how and when you were exposed to lead.
- Include your name, date of birth and phone number.
- Add your WSIB claim number if you already have one.
- Write a basic statement of the facts. See examples on the left.

- List job tasks
- You can either attach this to your Form 6 or send it in later after WSIB provides you a claim number. Once you have it, include the claim number on everything you send to WSIB.

The WSIB will call you to verify your information. Make sure to keep a copy of the Form 6 for yourself and give a copy to your employer.

PROGRAM FOR EXPOSURE INCIDENT REPORTING (**PEIR** PROGRAM)

This is a voluntary WSIB program for reporting hazardous exposures even in the absence of current health effects. Complete the WSIB's PEIR form if you believe you have been exposed to lead from the pipe sealant and its dust, but do not have any illnesses or symptoms that you think are related.

Use the PEIR form to document your exposure while information is as fresh as possible. If you later develop symptoms or an illness, this form will be linked to your WSIB claim. Some health effects of lead (such as cancer) may take a long time to develop.

https://www.wsib.ca/sites/default/files/2024-09/3958a_202407_workersexposureincidentform_web.pdf

- Fill out a PEIR form as soon as possible to document your past exposures. Attach additional sheets of paper if necessary to capture the most important details.
- Going forward, you can fill out a PEIR form for each day you are exposed to lead and send it in to WSIB.
- Fill out the basic form without the date and signature and make copies. Sign one each day and send them in to WSIB monthly.
- Submitting multiple forms draws attention to the exposure.
- The form can be mailed or faxed to WSIB or uploaded on the WSIB website.

The WSIB instructs using a Form 6 rather than a PEIR form if:

• You have symptoms or an illness that you think may be due to lead.

• If you need medical treatment, tests, or prescription medication because of the exposure.

BUT if you feel unsure or need more time to complete a Form 6, go ahead and submit a PEIR form to document your exposures as soon as possible. You do not have to provide a copy to your employer, and the WSIB does not inform your employer that a PEIR form has been submitted.

INSTRUCTIONS TO FILL OUT A PEIR FORM

WSIB Ontario | **Worker's exposure incident form (PEIR)**

Visit wsib.ca/submit to submit this form and supporting documents.

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WSIB use only			
Firm number	Rate number	Classification unit code	Reference number

The information you provide will help us record your exposure incident. Please provide as much detail as possible.

Your information		
Last name	Given name	Maiden name (if applicable)
Address		
City/Town	Province	Postal code
Telephone	Sex ☐ Male ☐ Female	Date of birth (dd/mm/yyyy)

- Complete your information.

Your employer's information	
Employer's name (at time of incident)	Date of hire (dd/mm/yyyy)
Describe the nature of your employer's business	Your occupation/job title
Employer's address	
City/Town	Province / Postal code
Location of the incident	

- Complete your employer's information.

Details of incident

Complete ~~**Section A** for an exposure to an infectious substance, or~~
Section B for an exposure to chemical or other workplace substances.

~~**Section A - (Infectious substance)**~~	~~Date of exposure (dd/mm/yyyy)~~	~~Time of exposure~~ ☐ AM ☐ PM

~~Please describe how you came into contact with the infectious substance (please check):~~

☐ Cut or scrape ☐ Body fluid splash ☐ Cough, sneeze ☐ Other (specify):

~~Source of exposure~~	~~Area of body affected~~

~~What infectious substance is suspected? (please check):~~

☐ Tuberculosis ☐ Meningitis ☐ Rabies ☐ Hepatitis ☐ Anthrax ☐ Campylobacter
☐ Salmonella ☐ Scabies ☐ Shingles ☐ Don't know ☐ Other (specify):

If you experienced any illness related to this incident, please complete a Worker's Report of Injury/Disease (Form 6). For further information, please contact 1-800-387-0750.

- Do not complete Section A for lead exposure. Skip to Section B.

Email accessibility@wsib.on.ca if you need a different format or accommodation. Disponible en français.

INSTRUCTIONS TO FILL OUT A PEIR FORM

WSIB Ontario | wsib.ca

Reference number

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Details of incident (continued)

Section B - (Chemical or Other Workplace Substances)

Date of exposure (dd/mm/yyyy)

Time of exposure ☐AM ☐PM

Please describe, in detail, what occurred (please check):

☐ Leak ☐ Spill ☐ Explosion ☉ Other (specify): **Chronic**

Please describe where you were at the time and how long you were in the affected area.
(If it would be helpful, attach a diagram to describe the event or another sheet for added information).

"I was exposed to lead daily from pipe dope. I was not properly informed for years. There were no proper hygiene measures for eating. Worked daily for (insert #) years until 2019; but now there is lead dust in everything and I am still being exposed. It is a continual problem in vehicles and other areas."

What personal protective equipment were you wearing at the time?

"I just found out (insert year of training) that I was not taking precautions and was only provided with (insert PPE and year). No one told me."

In the event that this exposure results in an illness that entitles you to benefits under the Workplace Safety and Insurance Act (the Act), by signing this form, you consent to the release of functional abilities information as required in section 22(5) of the Act, in the event there is a right to benefits.

Name	Signature	Date (dd/mmm/yyyy)

☐ Check this box if you are completing and submitting this form electronically. This represents your signature. You must fill out your name and the date above.

Personal information about you will be collected throughout your claim under the authority of the *Workplace Safety and Insurance Act, 1997*. Your personal information will be used to administer your claim(s) and programs of the Board. Medical and non-medical information is collected from health care providers, vocational agencies, labour market service providers, employers, witnesses, Canada Revenue Agency (CRA), and others as required. Your Social Insurance Number is used to register claims, identify workers and to issue income tax statements and is collected under the authority of the *Income Tax Act*.

Information may only be disclosed to the employer, external medical consultants, external service providers, researchers, third parties for cost recovery purposes and others as authorized by the *Workplace Safety and Insurance Act* and the *Freedom of Information and Protection of Privacy Act*. Your name and telephone number may be disclosed to third parties conducting satisfaction surveys and focus groups. Incoming and outgoing calls may be recorded for quality assurance purposes. Questions about this collection should be directed to the decision maker responsible for your file or by calling 1-800-387-0750.

Submit your exposure incident form to the WSIB

If your employer is reporting the exposure you may provide this form to them to include with their submission. You can also choose to forward the form directly to the WSIB.

By mail: WSIB 200 Front Street West, Toronto, Ontario M5V 3J1

By fax: 416-344-4684 | 1-888-313-7373

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- Tick Other: specify "chronic"
- Describe where you were at the time and how long you were in the affected area. See examples on the left.
- Describe what PPE you wore at the time. See example on the left.
- Sign and date the form and return it to WSIB.

YOUR LEGAL RIGHTS AND NEXT STEPS

The Occupational Health and Safety Act entitles all employees to three fundamental rights:

- The right to know about health and safety matters.
- The right to participate in decisions that could affect their health and safety.
- The right to refuse work that could affect their health and safety and that of others.

Workers' 3 Rights + One (Reprisal)

1. The right to KNOW.

- Lead Cross Contamination and Low-level exposure can cause health effects.
- PPE alone is not an effective control.
- Request Training.
- Information on how well a company control program and its components are performing.

2. The right to PARTICIPATE.

- Get involved with your Health and Safety Committee and ask questions.
- Be consulted with assessments, conduct inspections, raise hazards and request industrial hygiene testing.
- Notify your union health and safety representative of any concerns or questions.
- Request preplacement, periodic and exit examinations.
- Retirees would have been exposed daily. Contact the Local.
- Identify if you have any symptoms or diseases from lead exposure by ticking the boxes in the Health Effects section, above.
- Initiate a WSIB claim:

1. Complete a Form 6 if you have symptoms or health conditions that you think may be lead related.

2. Send it to WSIB.

3. WSIB will Contact you and adjudicate your claim.

4. If your WSIB claim is accepted or denied, please give a copy of your decision to your local union.

5. If your claim is denied, your local union will work with the Occupational Health Clinics for Ontario Workers (OHCOW).

- **Initiate a PEIR form to document your exposure if you have had lead exposure but do not have any symptoms or health conditions currently and send to WSIB.**

3. The right to REFUSE UNSAFE WORK.

- Refuse unsafe work as per the legislation. See your wallet card or download yours here: https://www.ohcow.on.ca/posts/health-safety-wallet-rights-cards/

4. The right to NO REPRISALS.

- *Note - *You also have the right to no reprisals, Section 50 under Occupational Health and Safety Act (S.50).**

How to protect yourself

We recommend you contact your Health and Safety Representative to discuss the recommendations for the employer in this booklet and participate in developing an action plan to protect yourself and others.

INFORMATION SOURCES

1. Agency for Toxic Substances and Disease Registry (ASTDR) 2020. Toxicological Profile for Lead https://wwwn. cdc.gov/TSP/ToxProfiles/ToxProfiles. aspx?id=96&tid=22
2. Ontario Code for Medical Surveillance for Designated Substances, Part II Medical surveillance program requirements for individual designated substances. https://www.ontario.ca/document/code-medical-surveillance-designated-substances/part-ii-medical-surveillance-program-requirements-individual-designated-substances#section-4
3. Masters Metallic Safety Data Sheet (SDS). https://www.oatey.ca/products/masters-metallic-compound-1257561033
4. Australian Institute of Occupational Hygienists (AIOH) 2018, Inorganic Lead – Potential for Occupational Health Issues (2018). https://www.aioh.org.au/product/inorganic-lead/
5. Pipe Line Contractors Association of Canada 2020, SAFETY ALERT: Red-label Masters Metallic Compound. https://pipeline. ca/safety-alert-red-label-masters-metallic-compound/
6. Work Safe BC 2020 Safe Work Practices for Handling Lead. https://www.worksafebc.com/en/resources/health-safety/books-guides/safe-work-practices-handling-lead?lang=en
7. Pipeline Contractors Safety Alert, https://pipeline.ca/wp-content/uploads/Safety-Alert-20200306.pdf
8. World Health Organization (WHO) 2023, Lead poisoning, Key Facts. https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health
9. O. Reg. 490/09: DESIGNATED SUBSTANCES https://www.ontario.ca/laws/regulation/090490
10. Agency for Toxic. Substances and Disease Registry (ATSDR) 2020, Toxicological Profile for Lead. https://www.atsdr.cdc.gov/toxprofiles/tp13.pdf
11. National Toxicology Program (NTP) 2012, NTP Monograph Health Effects of Low-Level Lead. https://ntp.niehs.nih.gov/sites/default/files/ntp/ohat/lead/final/monographhealtheffectslowlevellead_newissn_508.pdf
12. Marti et al. 2024, Structured expert judgement approach of the health impact of various chemicals and classes of chemicals. PLOS ONE | https://doi.org/10.1371/journal.pone.0298504 June 24, 2024. https://pubmed.ncbi.nlm.nih.gov/38913645/
13. Bechrifa et al. 2024, P-359 Evaluation of exposure to low doses in the circuit board manufacturing industry. Occupational Medicine, Volume 74, Issue Supplement_1, July 2024. https://www.icohweb.org/site/homepage.asp
14. Kosnett et al. 2023, ACOEM Position Statement Workplace Health and Safety Necessitates an Update to Occupational Lead Standard Provisions for Medical Removal Protection, Medical Surveillance Triggers, and the Action Level and Permissible Exposure Level for Lead in Workplace Air: ACOEM Response to OSHA. Journal of Occupational and Environmental Medicine 65(3):p e170-e176, March 2023. | DOI: Shape10.1097/JOM.0000000000002774. https://journals.lww.com/joem/fulltext/2023/03000/acoem_position_statement workplace_health_and.23.aspx

15. BC 2021, Environmental Protection Division Guideline to Managing Lead-containing Construction and Demolition Waste in B.C. https://www2.gov.bc.ca/assets/gov/environment/waste-management/hazardous-waste/hazardous-waste/resources/managing_lead-containing_construction_and_demolition_waste_guideline.pdf

16. CDC NIOSH HHE HHE Report No. 2019-0192-3377 January 2021.https://www.cdc.gov/niosh/hhe/reports/pdfs/2019-0192-3377.pdf

17. Nova Scotia Lead in the Workplace: A Guide to Working with Lead Revised September 18, 2015 Application – Code of Practice. https:// novascotia.ca/lae/healthandsafety/docs/ Lead_COP_Sep_2015.pdf

18. CDC NIOH 2024, Blood Lead Level Guidance. https://www.cdc.gov/niosh/lead/ bll-reference/index.html

19. Klotz K, Göen T 2017, Human Biomonitoring of Lead Exposure. Met Ions Life Sci. 2017 Apr. https://pubmed.ncbi.nlm.nih.gov/28731299/

20. ShapeSpecht AJ, Dickerson AS, Weisskopf MG 2019, Comparison of bone lead measured via portable x-ray fluorescence across and within bones. Environ Res. 2019 May; 172: 273–278. https://www.ncbi.nlm.nih.gov/

21. Nie et al. 2013, In Vivo Quantification of Lead in Bone with a Portable X-ray Fluorescence (XRF) System – Methodology and Feasibility. https://www.ncbi.nlm.nih.gov/pmc/articles/ PMC3718311/

22. Cecil et al. 2008, Decreased Brain Volume in Adults with Childhood Lead Exposure. PLoS Med. 2008 May; 5(5): e112. https://www.ncbi. nlm.nih.gov/pmc/articles/ PMC2689675/

23. The Government of Canada, "Levels of environmental chemicals in the Canadian population from the Canadian Health Measures Survey" Canadian biomonitoring dashboard. https://health-infobase.canada.ca/ biomonitoring/index.html

MORE INFORMATION

- ***For information on good lead management please see the following three models,***

1. CDC (2023), Reducing Workers' Lead Exposure During Water Service Line Removal and Replacement. https://www.cdc.gov/niosh/docs/wp-solutions/2023-141/pdfs/2023-141.pdf?id=10.26616/NIOSHPUB2023141
2. Targeted intervention program: Lead exposure at metalliferous mines, 2023. https://www.resourcesregulator.nsw.gov.au/sites/default/files/2023-06/targeted-intervention-lead-exposure-at-metalliferous-mines.pdf
3. Environmental Abatement Council of Canada (EACC) 2014, EACC Lead Guideline For Construction, Renovation, Maintenance or Repair October 2014. https://www.eaccanada.ca/guidelines/guideline-eacc-lead-form/

- ***For more information on the effects of lead,***

1. American College of Occupational and Environmental Medicine Docket No. OSHA–2018–0004. https://acoem.org/acoem/media/News-Library/Final-Lead-Comments-to-OSHA-October-2022.pdf
2. National Academy of Sciences 2012, Potential Health Risks to DOD Firing-Range Personnel from Recurrent Lead Exposure. Committee on Potential Health Risks from Recurrent Lead Exposure of DOD Firing-Range Personnel; Committee on Toxicology; Board on Environmental Studies and Toxicology; Division on Earth and Life Sciences; National Research Council. https://www.ncbi.nlm.nih.gov/books/NBK206966/
3. AIOH Exposure Standards Committee 2018, Inorganic Lead – Potential for Occupational Health Issues. https://www.aioh.org.au/product/inorganic-lead/
4. Body Burden of Lead, (Reference: Lauwerys and Hoet 1993, Industrial Chemical Exposure third edition).

- ***To read more about Health Hazard Evaluations,***

https://www.cdc.gov/niosh/hhe/reports/pdfs/2019-0192-3377.pdf

- ***For Workplace Safety Insurance Appeals,***

Workplace Safety Insurance Appeals Tribunal (Ontario). https://www.wsiat.on.ca/en/home/announcements.html

- ***For a blood lead conversion calculator visit,***

https://www.scymed.com/en/smnxtb/tbcbgth1.htm