Harmful substances in the workplace

OHS information for employers, supervisors and workers

This bulletin introduces occupational health and safety laws that apply to harmful substances at work, with a focus on Part 4 of the Occupational Health and Safety (OHS) Code.

KEY INFORMATION

- Harmful substances can be present in many forms.
- Employers must eliminate a harmful substance if that's reasonably practicable.
- If a harmful substance can't be eliminated, requirements in Part 4 of the OHS Code as well as other rules in Alberta's *Occupational Health and Safety Act,* Regulation and Code apply. **Always consult the legislation directly** to make sure you know what rules you have to follow.

Introduction

Exposure to harmful substances is a significant cause of workplace illness and injury.

HARMFUL SUBSTANCE MEANS …

"… a substance that, because of its properties, application or presence, creates or could create a danger, including but not limited to a chemical, biological or radiological hazard, to the health and safety of a worker exposed to it;"

OHS Act, S. 1(o)

The severity of the hazard depends on what type and quantity of substance a worker is exposed to, how long the exposure lasts and how frequent it is, and what the route of exposure is (that is, if the harmful substance is breathed in, absorbed, injected or swallowed).

Health symptoms may appear quickly or gradually over time. In some cases, symptoms can vary between individuals: for example, a person may experience health-related effects because they are sensitive or allergic to a substance.

Some substances that are harmful to health may also be a safety hazard (for instance, they may be flammable, explosive, or dangerously reactive with other substances or the environment).

Recognizing harmful substances

Knowing whether harmful substances are at a work site can be as simple as reading the labels and safety data sheets required by federal WHMIS law.

However, not all harmful substances are in labelled containers. Here's a few examples:

- Chemicals found in equipment, such as lead-acid or mercuric oxide batteries, mercury switches or thermometers, or fluorescent light bulbs.
- Fuels in vehicles or powered mobile equipment, such as gasoline, diesel or propane.
- Off-gases, such as benzene, toluene, xylene or formaldehyde, from solid or liquid materials.
- Gases, fumes or vapours, such as carbon monoxide, hydrogen sulphide, nitrogen oxide or ozone, released from equipment or industrial processes.
- Airborne fibres or particulates, such as asbestos or wool, or coal dust, silica, pesticides or flour.
- Mould that has accumulated in a building after a flood or from ongoing dampness.
- Bodily fluids and wastes.
- Environmental toxins.

To ensure a healthy and safe work site, everyone must know what harmful substances are (or could be) present. Additional requirements may apply depending on each person's role, tasks and associated specific hazards.

Eliminate the hazard

If it's reasonably practicable, an employer must eliminate any identified hazards. Changing a work process or substituting a safer product are two approaches employers can use to eliminate a harmful substance.

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Examples of approaches to eliminate a harmful substance include:

- Using abrasion to clean or degrease tools or equipment instead of a hazardous solvent.
- Using an electric (rather than diesel or propane) forklift to eliminate carbon monoxide at the work site.

Note that employers must evaluate health and safety implications when making a process change or substitution. If the change introduces new hazards, the employer must also assess and eliminate or control the new hazard. Learn more about hazard elimination, assessment and control requirements in Hazard assessment and control: a handbook for Alberta employers and workers.

Part 4 of the code

Rules that apply specifically to harmful substances are in Part 4 of the OHS Code ("Chemical Hazards, Biological Hazards and Harmful Substances"). Here's an overview of the requirements in Part 4.

General rules (apply to all harmful substances)

Controlling potential exposure

The employer must keep ALL harmful substances **as low as reasonably achievable**. [Section 16(1) of the OHS Code.]

Further to controlling potential worker exposure, Section 21 of the OHS Code states that employers must:

- Identify the health hazards associated with potential exposure to a harmful substance at the work site and assess worker exposure to the substance.
- Inform workers about:
  - Health hazards associated with exposure.
  - Airborne concentration measurements of harmful substances at the work site.
- Establish procedures that minimize worker exposure, train workers in those procedures and ensure workers use the procedures appropriately.

WORKER REQUIREMENT
Workers must use the procedures appropriately and apply the training. (Section 21 of the OHS Code.)

Worker decontamination

Section 23 of the OHS Code states that if a worker can be contaminated by a harmful substance at the work site, the employer must provide facilities so workers can clean (decontaminate) themselves before they leave. The type of facilities must be appropriate to the hazard (including, if necessary, on-site shower facilities).

Also, from Section 23 of the code, employers must ensure workers only take properly decontaminated or cleaned articles and clothing from the work site.

Note that:

- Per Section 171(8)(d) of the OHS Code, a worker must not use compressed air to clean dust or other substances from clothing.
- The appropriate cleaning method depends on the specific substance and what's being cleaned.
  - Examples of cleaning methods can include wet wiping, using absorbents or using a HEPA vacuum.

Emergency eye or skin washes

Per Section 24 of the OHS Code, if chemicals harmful to the eyes or skin are used at a work site, the employer must ensure workers have immediate access to emergency baths, showers, eye wash equipment or other equipment appropriate for the potential level of exposure.

No eating, drinking or smoking

Employers must ensure no one eats, drinks or smokes in a part of a work site contaminated by a harmful substance. This requirement is stated in Section 25 of the OHS Code and is also part of an employer's general duty (under Section 3 of the OHS Act) to ensure the health and safety of workers and other persons at or near the work site.

WORKER REQUIREMENT
Workers must not eat, drink or smoke in a part of a work site contaminated by a harmful substance. (Section 25 of the OHS Code and Section 5 of the OHS Act.)

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Storage

Per Section 27 of the code, employers must ensure that a harmful substance used or stored at the work site is clearly identified and is used and stored in a way that doesn't create a hazard.

Additional rules (for substances listed in Schedule 1 of the OHS Code)

There are two tables in Schedule 1 of the OHS Code. Additional rules apply to substances in these tables.

- Table 1 is a list of chemicals that require a code of practice when they are present above specified quantities. (See the next page for more on this requirement.)
- Table 2 lists harmful substances and their occupational exposure limits.

OCCUPATIONAL EXPOSURE LIMITS

An "occupational exposure limit" is the maximum concentration of a harmful substance to which a worker may be exposed over a period of time. They can be expressed in different ways:

- An 8-hour time weighted average.
- A 15-minute short-term exposure average.
- A ceiling limit, which must never be exceeded.

Occupational exposure limits

If a substance is listed in Schedule 1, Table 2 of the OHS Code, the employer must ensure worker exposures are as low as reasonably achievable **AND** don't exceed occupational exposure limits in that table. [Sections 16(1) and 16(2) of the OHS Code.]

If a substance in the table has a ceiling limit, a worker can't be exposed at a concentration above that limit at any time. [Section 16(3.1) of the code.]

Sections 16, 17 and 18 of the OHS Code set out rules that apply in situations where:

- A harmful substance in Schedule 1, Table 2 is present at the work site but doesn't have a 15-minute or ceiling occupational exposure limit. [Section 16(4).]
- A worker is exposed to multiple substances in the table. (Section 17.)
- Work shifts are longer than eight hours. (Section 18.)

Airborne concentration measurements

Section 20 of the OHS Code sets out rules that apply when measuring the airborne concentration of a harmful substance to comply with occupational exposure limits required by the code. These rules specify:

- Acceptable analytical methods.
- Basic competency requirements.
- Record retention requirements.

COMPETENT ASSESSMENT IS A MUST

Some employers may have in-house staff who are competent (that is, adequately qualified, suitably trained and sufficiently experienced) to assess exposures to harmful substances or apply technical requirements such as those in Sections 16(4), 17 and 18. Other employers may choose to hire a competent occupational health and safety consultant. **Competency is a legal requirement**. Learn more in Occupational hygiene reports: requirements and tips.

Worker overexposure

Section 22 of the code sets out the following requirements related to worker overexposures.

- If a worker may be exposed to an airborne concentration that is more than the occupational exposure limit of a substance, the employer must measure the substance's concentration.
- If a worker is exposed to more than the occupational exposure limit of a substance, the employer must immediately:
  - Identify the cause of the overexposure.
  - Protect the worker from any further exposure.
  - Control the situation to prevent other workers from being overexposed to airborne concentrations of the substance.
  - Explain the nature and extent of the overexposure to the worker.
- As soon as reasonably practicable, the employer must also notify their health and safety committee or representative (if there is one) that a worker has been overexposed, and the steps taken to control the event. The notification must be in writing.

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Code of practice

Per Section 26 of the OHS Code, an employer must develop a code of practice governing the storage, handling, use and disposal of a substance in Schedule 1, Table 1 if it's present at the work site as either of the following:

- A pure substance weighing more than 10 kilograms.
- A substance in a mixture, where the substance is present at both
  - a weight of more than 10 kilograms, and
  - a concentration of 0.1 per cent by weight or more.

The code of practice must include measures to prevent uncontrolled release of the substance. It must also give the procedures to follow if there is a release. The specific steps for dealing with releases must be consistent with and reference the employer's emergency response plan.

See Appendix A for a sample code of practice outline.

Asbestos, silica, coal dust, lead and mould

Sections 28 to 43 of Part 4 of the OHS Code set out additional specific rules that apply to asbestos, silica, coal dust, lead and mould. Learn more about these in the applicable resources in For more information. (The Alberta Asbestos Abatement manual, and the coal dust, lead, silica and mould bulletins, respectively.)

Other OHS Code requirements

OHS Code, Part 2

Hazard assessment, elimination and control requirements in Part 2 of the OHS Code apply to all workplace hazards, including harmful substances. Learn more in the hazard assessment and control handbook.

Other parts of the code

Requirements in other parts of the OHS Code may also apply in relation to harmful substances. These include:

- Confined space requirements in Part 5.
- Fire and explosion requirements in Part 10.
- General safety requirements in Part 12.
- Personal protective equipment requirements, Part 18.
- Toilet and washing facility requirements, Part 24.
- Ventilation system requirements in Part 26.
- WHMIS requirements in Part 29, if a chemical is a hazardous product under the Hazardous Products Regulation (Canada).
- Requirements in Part 35, if a biological hazard is a "biohazardous material" as defined in the OHS Code.
- Task-specific parts of the code, such as Part 32 (Excavation and Tunnelling) or Part 33 (Explosives).
- Industry-specific parts of the code, such as Part 36 (Mining).

EMERGENCIES AND FIRST AID

Harmful substances at your work site must be considered in your emergency response and workplace first aid planning (Parts 7 and 11 of the OHS Code, respectively). Learn more about these topics in the emergency response planning toolkit and the "First aid in the workplace" bulletin listed in For more information.

Examples of emergency and first aid situations that must be addressed include:

- Leaks, spills or other uncontrolled releases.
- Splashes or spills that contact skin or eyes.
- Acute health effects from inhalation.
- Fire or explosion.

CONSULT THE LAW

Remember to always consult the law directly. Note that you can use the Government of Alberta's OHS legislation search tool to quickly find, download or share individual sections of the *Occupational Health and Safety Act*, Regulation and Code.

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Contact us

OHS Contact Centre

Alberta toll-free
- 1-866-415-8690

Edmonton region
- 780-415-8690

Deaf or hard of hearing (TTY)
- 1-800-232-7215 (Alberta toll-free)
- 780-427-9999 (Edmonton region)

Notify OHS of health and safety concerns

alberta.ca/file-complaint-online

> Call the OHS Contact Centre if you have concerns that involve immediate danger to a person on a work site.

Report a workplace incident to OHS

alberta.ca/ohs-complaints-incidents

Website

alberta.ca/ohs

Let us know what you think!

To provide feedback on this bulletin, visit ohs-pubstore.labour.ab.ca/GS022 and click “Give resource feedback”.

Get copies of the OHS Act, Regulation and Code

Alberta King’s Printer
alberta.ca/alberta-kings-printer

OHS
alberta.ca/ohs-act-regulation-code

For more information

Alberta Asbestos Abatement Manual (ASB001)
ohs-pubstore.labour.alberta.ca/asb001

Coal dust at the work site (CH063)
ohs-pubstore.labour.alberta.ca/ch063

Emergency response planning toolkit (BP040)
ohs-pubstore.labour.alberta.ca/bp040

First aid in the workplace (FA020)
ohs-pubstore.labour.alberta.ca/fa020

Hazard Assessment and Control handbook (BP018)
ohs-pubstore.labour.alberta.ca/bp018

Lead at the work site (CH071)
ohs-pubstore.labour.alberta.ca/ch071

Mould in the workplace (BH018)
ohs-pubstore.labour.alberta.ca/bh018

Occupational hygiene reports: requirements and tips (GS019)
ohs-pubstore.labour.alberta.ca/gs019

Silica at the work site (CH059)
ohs-pubstore.labour.alberta.ca/ch059

Legal terms 101: “reasonably practicable” (LGT001)
ohs-pubstore.labour.alberta.ca/lgt001

WHMIS for workers (CH007)
ohs-pubstore.labour.alberta.ca/ch007

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Appendix A: Harmful substance code of practice sample outline

This is one example of an outline for a harmful substance code of practice. If you choose to follow this outline, make sure you customize it to your work and work site, and provide all required information.

General information

Employer name:

Date:

Work site location:

Harmful substance:

Code of practice prepared by: *(Provide name and contact information.)*

Harmful substance description

(Provide full description of the harmful substance and the associated health and safety hazards.)

Potential exposures

(Identify any work processes, procedures or tasks, or areas of the work site where workers can be exposed to the harmful substance. Include information about occupational exposure limits.)

Handling procedures

(Include controls required to ensure workers can safety handle the harmful substance. Controls must follow the employer's hazard assessment, completed in compliance with Part 2 of the OHS Code. If personal protective equipment is required, describe measures to comply with Part 18 of the OHS Code.)

Safe use procedures

(Include controls required to ensure workers can safely use the harmful substance. As above, controls must follow the employer's hazard assessment, and the procedures must include PPE requirements if applicable.)

Storage procedures

(Describe how the harmful substance is used or stored at the work site. Include how it is clearly identified and cannot cause a hazard to workers. As above, controls must follow the employer's hazard assessment, and the procedures must include PPE requirements if applicable.)

Disposal procedures

(Describe steps to safely and legal dispose of the harmful substance or waste products containing the harmful substance. As above, controls must follow the employer's hazard assessment, and the procedures must include PPE requirements if applicable.)

Measures to prevent uncontrolled release

(Provide clear direction on how to prevent an uncontrolled release of the harmful substance. As above, controls must follow the employer's hazard assessment, and the procedures must include PPE requirements if applicable.)

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Procedures if there is an uncontrolled release

(Provide clear direction on what to do if there is an uncontrolled release of the harmful substance. Must include required first aid measures, services and equipment. Must reference emergency response plan for rescue and evacuation required under Part 7 of the OHS Code, if applicable. Must include internal and external incident reporting requirements. Must include worker follow-up and monitoring procedures, if applicable.)

Site contacts

(Provide relevant names and contact information for any procedures or training cited above.)

Other information

(As applicable to worker health and safety.)

This form is for example purposes only. Completing this form alone will not necessarily put you in compliance with the legislation. It is important and necessary that you customize this document to meet the unique circumstances of your work, workers, and work site. Further, it is essential that this document is not only completed, but is used, communicated and implemented in accordance with the legislation. The Crown, its directors, officers, officials, servants, agents, sponsors, employees, contractors, and volunteers will not be liable to you for any damages, direct or indirect, including any personal injury, death, property damage or loss sustained by you, arising out of any cause whatsoever, as a result of your use of the information contained in this material.

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