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## Chemical and Biological Substances Standard

### 1.0 PURPOSE

This standard previously known as the WHMIS Standard has been retitled to the Chemical and Biological Substance Standard. The Biological Hazard Standard, the Flammable/Combustible Liquids Standard and the Chemical Protective Clothing Standard have also been integrated into the Chemical and Biological Substance Standard.

This standard supports SaskPower Health, Safety and Environment Policy and establishes the requirements for appropriate handling, use, storage, and disposal of hazardous substances. As part of ensuring compliance, employees shall be:

- Able to identify and understand supplier and workplace hazardous product labels.
- Capable of using Safety Data Sheets (SDS) for more information on a hazardous product.
- Trained in the safe handling, use, storage, disposal of and/or exposure to hazardous products.

### 2.0 DEFINITIONS

#### 2.1 Biological Hazards

Term applied to organisms or products of organisms that present a health risk to humans.

#### 2.2 Biological Substance

A substance that contains living organisms, including infectious micro-organisms, or parts of organisms in their natural or modified forms.

#### 2.3 Bulk Shipment

A hazardous product that is contained without intermediate containment or packaging in a vessel with a water capacity equal to or greater than 450 liters, pipeline, road vehicle, or portable tank.

#### 2.4 Chemical Substance

Any natural or artificial substance, whether in the form of a solid, liquid, gas or vapor, other than a biological substance.

#### 2.5 Chemical Protective Clothing (CPC)

An item of clothing that is specifically designed and constructed for the intended purpose of isolating all or part of the body from a biological or chemical hazard.

#### 2.6 Consumer Commodity

A product that is packaged and sold to a consumer for home use. A consumer product may be a hazardous product; however, if single units (i.e. not per case) are purchased from a consumer outlet and brought to the workplace, WHMIS requirements does not apply, with respect to the supplier label and the SDS.

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## 2.7 Dangerous Goods

Products, substances, or organisms included by its nature or by the regulations in any of the classes listed in the schedule to the Act are transported and identified under the Transportation of Dangerous Goods legislation (TDG) or the Hazardous Substances and Waste Dangerous Goods Regulations as requiring special precautions such as placards and manifests.

## 2.8 Degradation

A measurement of the physical deterioration of the material, due to contact with a chemical or exposure to ambient conditions. The material may get harder, stiffer, more brittle, softer, weaker or may swell. The worst example is that the material may actually dissolve in the chemical.

## 2.9 Exposed

Contact with chemical, physical, biological agents or other health risk occurring in their environments.

## 2.10 Education

The delivery of general information to workers.

## 2.11 Engineered Control

A control such as ventilation that modifies or reduces the potential of exposure.

## 2.12 Hazardous Product

Means any product, mixture, material or substance that is classified in accordance with the regulations made under subsection 15(1) in a category or subcategory of a hazard class listed in Schedule 2. For the purpose of this standard, hazardous products include, but are not limited to chemical and biological substances.

## 2.13 Hazardous Waste

A hazardous product that is intended for disposal or is acquired or generated for recycling or recovery.

## 2.14 Manufactured Article

An article that is formed to a specific shape or design during manufacture, the intended use of which when in the form is dependent, in whole or in part, on its shape or design, and that under normal conditions of use, will not release or otherwise cause a person to be exposed to a hazardous product.

## 2.15 Penetration

The passage of contaminants through seams, zippers, pinholes and other imperfections in the material.

## 2.16 Permeation

Permeation rate is the rate at which the chemical will move through the material. It is measured in a laboratory and is expressed in units such as  $\mu\text{g}/\text{cm}^2\cdot\text{min}$ . The higher the permeation rate, the faster the chemical will move through the material. Breakthrough detection time is used to quantify the time it takes a chemical to permeate through a material.

### **2.17 Readily Available (SDS)**

Means present in an appropriate place in the form of a physical or electronic copy that can be accessible to a worker.

### **2.18 Safety Data Sheet (SDS)**

Means a document that contains, under the headings that, by virtue of the regulations made under subsection 15(1), are required to appear in the document, information about the hazardous product, including information related to the hazards associated with any use, handling or storage of the hazardous product in a work place.

### **2.19 Supplier**

A manufacturer, importer or distributor of a hazardous product.

### **2.20 Supplier Label**

A label provided by a supplier that contains the information elements required by Part 3 of the *Hazardous Products Regulations*.

### **2.21 Training**

The delivery of worksite and job-specific information to workers.

### **2.22 Workplace Hazardous Material Information System (WHMIS)**

A Canada wide system developed to inform workers about the safe use of hazardous materials in the workplace. It is Canada's national hazard communication standard for hazardous products used in the workplace.

### **2.23 Workplace Label**

A legible label that contains a product identifier that is identical to its SDS, information for safe handling of the hazardous product, including signal words and hazard statements, and that an SDS is available.

## **3.0 METHOD/PRACTICE**

### **3.1 Identification**

- A hazard/aspect and risk assessment (HARA) shall be performed to identify the hazardous substances that employees may use, store, handle, dispose and/or be exposed to.
- Identify potential flammable and combustible liquids or vapors that may be present including situations where an ignition source impacts risk. Appropriate volume and storage limits shall be considered.
- A list of chemical and biological substances shall be developed, maintained and included in a Chemical Inventory List with priority given to bulk and frequently used hazardous chemicals.
- All practical steps shall be taken to prevent employee exposure to chemical and biological substances to an extent that are likely to be harmful to the employee. Whenever reasonable, substitution to a product of lesser hazard rating will be done.
- Employees handling chemical and biological substances (including waste) shall wear the appropriate personal protective equipment (PPE).

## 3.2 Types of Hazardous Substances

### 3.2.1 Biological Substances

- Where an employee may be exposed to biological substances, the employee shall be provided with information concerning the hazard/aspect and risk and if required as per a HARA, a procedure shall be developed in order to eliminate or minimize exposure.
- If a procedure is required, it shall:
  - be documented;
  - identify employees that may be exposed;
  - describe the organism's route of entry into the body;
  - describe the signs and symptoms of any disease that may arise;
  - identify infection control measures and limitations, which may include vaccination, engineering controls, personal protective equipment, safe work practices, procedures for handling a spill or exposure;
  - investigate exposure incidents;
  - describe the information given to employees to elevate awareness.
- Employees that may be exposed to biological substances shall be informed of all control measures.

### 3.2.2 Chemical Substances

- Most chemical substances are classified as hazardous products under the Hazardous Products Act. The Hazardous Products Act requires suppliers of hazardous products to communicate the hazards associated with their products via product labels and Safety Data Sheets (SDSs) as a condition of sale and importation for workplace use.
- The WHMIS national program is to help ensure the protection of Canadian workers from the adverse effects of hazardous products through the provision of relevant health and safety information. WHMIS is implemented through interlocking federal legislation administered by the Department of Health and federal, provincial and territorial occupational health and safety laws.
- To facilitate these requirements, WHMIS requires that:
  - Supplier labels are affixed to all non-consumer products brought into SaskPower, and remain legible and in good condition.
  - Workplace labels are required for all decanted hazardous products, which includes the name (product identifier) of the hazardous product, requirements for safe handling and reference to the SDS.
  - SDSs are to be readily available to those working with hazardous products.
  - When a hazardous product used in the workplace is three years old, if possible, an up-to-date supplier SDS with respect to that product shall be obtained.
  - Consumer products purchased by SaskPower from retail outlets in large quantities (i.e. by the case) require an SDS.
  - All employees required to handle hazardous products are to be educated and trained in the use of the products that they may use, store, handle, dispose and/or be exposed to.
  - Hazardous products produced at the facility are to comply with the WHMIS Regulations and a SDS shall be prepared and made available. The SDSs shall also be updated as soon as possible when significant new hazard information becomes available.
- Products exempt from WHMIS with respect to supplier label or SDS requirements are: explosives, pesticides, radioactive material, consumer products, cosmetics, food & drug, hazardous waste and/or there is a trade secret.
- WHMIS requirements do not apply to: wood and wood products; tobacco; manufactured articles; and products transported or handled pursuant to legislation governing the transportation of dangerous goods.
- Safe Work Procedures shall be developed by user groups.

### 3.3 Control Methods

Implement appropriate controls to eliminate or minimize exposure for the situation including, but not limited to:

- Substitution with less hazardous substances.
- Addition of appropriate engineered controls.
- Proper and prompt disposal of hazardous waste,
- Measures to eliminate sources of ignition to within a safe distance from flammable and combustible liquids and vapors.
- Measures to minimize, and where possible eliminate, the release of vapors, including sealed containment and appropriate exhaust and ventilation systems.
- Strict adherence to safety and environmental storage requirements.
- Strict adherence to grounding and bonding requirements.
- Current emergency preparedness and response plans and procedures, equipment, training, and response drills appropriate for the situation.
- Regular inspection and maintenance of relevant tools, equipment, tanks, containment, controls, and electrical installations in hazardous locations.
- Compliance with all Fire Codes, related standards, and other legal requirements.

### 3.4 Education & Training

- All employees who handle or may be exposed to hazardous products shall be educated on information concerning the Workplace Hazardous Materials Information System (WHMIS) including, but not limited to hazard classes, hazard symbols/pictograms, supplier and workplace labels and the SDSs of hazardous products.
- Worksite and/or job specific training/awareness concerning the use, storage, handling and disposal of chemical and biological substances and their potential health effects shall be provided to employees who work with or may be exposed to chemical or biological substances and documented.
- All employees handling hazardous products shall be trained on the SDS database. A SDS Service is available to all SaskPower employees and it provides a searchable database of hazardous materials that may be in the workplace. The database allows searching, displaying and printing of current SDSs and labels.
- Employees who are required to ship/receive or transport any dangerous goods (gas, liquid or solid) shall be trained in *The Transportation of Dangerous Goods Act and associated regulations*.
- Additional education and/or training shall be provided to employees when work conditions change, new substances are brought into the workplace, when hazard information changes or when new hazard information becomes available for a particular substance.

### 3.5 Emergency Response

- Emergency shower and/or eyewash facilities shall be available at all work locations where required.
- Supervisors shall ensure employees who may use, store, handle, dispose and/or be exposed to hazardous substances are trained to respond to an emergency, as per the emergency response plan.
- Incidents shall be reported and investigated according to the Incident Management Process.

### 3.6 Personal Protective Equipment (PPE)

- All personal protective equipment (PPE) required shall be used appropriately and kept in good condition.

- As in all situations where a chemical or biological hazard may be encountered, the SDS is to be consulted; this will contain sections to address the hazards of the chemical as well as the recommended Personal Protective Equipment.
- Selection of chemical protective clothing shall be documented with respect to the above considerations. Refer to the applicable Chemical Protective Clothing Job Aids for more information on selection and use.

### 3.7 Storage and Disposal

- All chemical and biological substances in the workplace shall be stored in accordance with provincial, federal and municipal regulations.
- The storage area shall have applicable access control with required information (e.g., emergency contact number).
- The designated storage area shall be inspected and maintained properly, including maintaining the required secondary containment for biological/chemical substances storage.
- Bulk chemical and biological substances contained in piping systems and vessels shall be identified through the use of colour coding, labels, placards or any other mode of identification where the chemical and biological substance is contained or transferred in/on.
- If an applied label to a hazardous product or container becomes illegible or is accidentally removed, the label shall be replaced with either a supplier label or workplace label.
- Expired biological and chemical substances shall be removed/disposed of promptly and properly.
- Disposal of a chemical or biological substance shall be in accordance with provincial, federal and municipal regulations.

### 3.8 Purchase

- A hazard/aspect and risk assessment on new chemical and biological substances to be purchased shall be performed prior to receiving.
- The hazard /aspect and risk assessment shall include an SDS review to determine:
  - It is not classed as a banned substance;
  - If there is a less hazardous substance that can be substituted;
  - Handling, storage and disposal (including waste, containers and excess chemical) requirements; and
  - Additional training for safe use and handling.
- Chemical and biological substances that are hazardous products shall have an SDS and label upon receipt.
- SDSs received shall be reviewed and updated if necessary in the SDS database as defined per location/site procedure.
- New product SDSs shall be sent to the Health and Safety Department to be reviewed and added to the SDS database.

## 4.0 REFERENCES

- Saskatchewan
  - The Saskatchewan Employment Act, 2014
  - The Occupational Health and Safety Regulations, 1996
  - The Occupational Health and Safety (Workplace Hazardous Materials Information System) Regulations
  - The Public Health Act, 1994
  - Saskatchewan Fire Code Regulations
  - Saskatchewan Fire Code
  - The Hazardous Substances and Waste Dangerous Goods Regulations
  - Saskatchewan Environmental Code

- Canada
  - Hazardous Products Act
  - Hazardous Products Regulations
  - Hazardous Materials Information Review Act
  - Hazardous Materials Information Review Regulations
  - The Transportation of Dangerous Goods Act
  - Transportation of Dangerous Goods Regulations
  - WHMIS 2015
  - The National Fire Code
  - The National Building Code
  
- SaskPower (located on SafetyNet)
  - Safety and Environment Rulebook
  - Chemical Inventory Lists
  - SaskPower Complete List of Hazards
  - Safe Work Practice: Biosecurity for Personnel Entering Livestock Facilities
  - Safe Work Practice for Cleaning Work Areas Contaminated with Biological Hazard
  - Safe Work Practice for Accessing/Entering Land Where a Biohazard may Exist
  - Emergency Showers and Eye Wash Station Standard
  - SDS Software
  - Related Guidelines, Procedures and Job Aids.
  
- Third Party
  - Chemical and Biological Substances Guide
  - ASTM F1461-12
  - CAN/CSA-B149.2-15 Propane Handling and Storage Code
  - Relevant NFPA and CSA standards (Note: any standard required by a legal requirement such as the National Fire Code is a legal requirement; other reputable standards will likely be expected as best management practices by regulatory authorities).

## APPENDIX I – Classes of Flammable and Combustible Liquids

### Classification of Flammable Liquids

Class	Flash Point	Boiling Point	Examples
1A	Below 22.8 °C	Below 37.8 °C	Ethyl ether, Pentane, Ligroin, Petroleum ether
1B	Below 22.8 °C	At or above 37.8 °C	Acetone, Benzene, Cyclohexane, Ethanol, Gasoline, Toluene, Methanol, Isopropanol
1C	22.8-37.8°C	N/A	Butanol, Isobutanol, Turpentine, Xylene, Styrene

### Classification of Combustible Liquids

Class	Flash Point	Boiling Point	Examples
2	37.8-60 °C	N/A	Diesel fuel, Motor oil, Kerosene, Cleaning solvents
3A	60-93.3 °C	N/A	Linseed oil, Mineral oil, Pine oil
3B	93.3 °C	N/A	Ethylene glycol, Glycerine, Hydraulic fluids



## APPENDIX II – Maximum Permissible Quantity of Flammable and Combustible Liquids

