Study Guide
for obtaining the

Workplace Hazardous Materials Information System (WHMIS) 2015 Ticket

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INSTRUCTIONS FOR DISTANCE LEARNING—WHMIS

Read all the material before attempting the exam. If you have any questions please call the Training Plan during normal working hours. (Monday to Friday 8:00 am to 4:00 pm)

This distance learning course is generic in nature. It will provide you with general information about WHMIS that applies to all workplaces. Your WHMIS education begins with this course and continues with each new job site you work at. You and your employer are responsible for your continuing education about WHMIS and WHMIS controlled products.

After successful completion of this course and additional job site specific training, double check your knowledge by asking yourself these four questions when working with a WHMIS controlled product:

1. What are the hazards of this controlled product?
2. What protective gear should I be wearing when working with this controlled product in this situation? (indoors?, outdoors?)
3. What do I do if I spill this controlled product on myself or on the floor or ground?
4. Where can I get more information about this controlled product?

A WorkSafe BC Inspector may observe you handling, working with, disposing of, a controlled product. If the WorkSafe BC Inspector is concerned by your actions, he/she may ask you the four preceding questions. If you can’t provide the inspector with informed answers he/she will be in a position to make recommendations in regards to the jobsite/workplace and its’ failure to comply with WHMIS regulations.
Overview of WHMIS

The Workplace Hazardous Materials Information System (WHMIS) provides Canadian workers with information about hazardous products used in the workplace. Under WHMIS, workers have the right to receive information about each hazardous product they use – for example, its identity, hazards and safety precautions. The goal of WHMIS is to reduce injury and disease by communicating specific health and safety information about hazardous products to workers. Workers can use this information to reduce their exposure to hazardous products.

Key Elements of WHMIS 2015

WHMIS 2015 divides hazardous products into two major hazard groups:

- Physical hazards
- Health hazards.

The physical and health hazard groups are split up into a number of classes. Some classes are divided even further into categories. The classes are depicted by pictograms that identify their specific hazard. After a hazardous product has been classified, the following three WHMIS elements are used to communicate health and safety information:

- WHMIS labels alert workers to the identities of the products, their hazards and precautions to be taken. Under WHMIS 2015 these labels must display some elements in a certain order. The wording of the hazards has been standardized.
- Safety Data Sheets (SDS's) provide detailed hazard and precautionary information under WHMIS 2015. SDS’s use a 16 section format. The information required in each section has been standardized
- WHMIS education and training programs. Employers provide education and training for workers so that they can work safely with and near hazardous products. Workers need to know how WHMIS works, the hazards of hazardous products in their workplaces and the safe work procedures they must follow.

Note: Not all hazardous products in the workplace are sold with WHMIS labels and SDS’s. Some hazardous materials are sold with labeling and hazard information meeting the requirements of other legislation. These products are either exempt or excluded from WHMIS requirements.
Products Not Covered By WHMIS 2015

The exclusions under WHMIS 2015 are:

- Explosives (as defined by the Explosives Act)
- Cosmetics, devices, drugs or foods (as defined in the Food and Drug Act)
- Pest control products (as defined in the Pest Control Products Act)
- Consumer products (as defined in the Canada Consumer Products Safety Act)
- Wood or products made of wood
- Nuclear substances (within the meaning of the Nuclear Safety and Control Act) that are radioactive.
- Hazardous waste (being a hazardous product that is sold for recycling or recovery and is intended for disposal)
- Tobacco and tobacco products (as defined in the Tobacco Act)
- Manufactured Articles

Many of these products are covered under other laws, as noted above. While a product may be exempt from the requirement to have a WHMIS label and SDS, employers must still provide education and training on health effects, safe use and storage.

When Consumer Products Are Used In The Workplace

Consumer products are those products that can be purchased in a store and are generally intended to be used in the home. They often include cleaning products, adhesives or lubricants. These products are labelled according to other legislation. A comprehensive chemical safety program would include both hazardous products as regulated by WHMIS and any other products that a worker may be exposed to (which includes consumer products). Workers should still receive education and training for safe use of these products.
CLASSIFICATION OF HAZARDOUS PRODUCTS
CLASSIFICATION OF HAZARDOUS PRODUCTS

How hazardous products are classified in WHMIS 2015

The way that hazardous products are classified has changed in WHMIS 2015. Hazardous products are now divided into two hazard groups:

- **Physical hazards**, based on the physical or chemical properties of the product, such as flammability, reactivity or corrosively to metals
- **Health hazards**, based on the ability of the product to cause a health effect, such as:
  - Eye irritation
  - Respiratory sensitization (may cause allergy or asthma symptoms, or breathing difficulties)
  - Carcinogenicity (may cause cancer)

The two hazard groups are further divided into hazard classes. Hazard classes are a way of grouping together products that have similar properties.
Physical hazards

The physical hazards group includes the following hazard classes:

- Combustible dusts
- Corrosive to metals
- Flammable aerosols
- Flammable gases
- Flammable liquids
- Flammable solids
- Gasses under pressure
- Organic peroxides
- Oxidizing gases
- Oxidizing liquids
- Oxidizing solids
- Pyrophoric gases
- Pyrophoric liquids
- Pyrophoric solids
- Self-heating substances and mixtures
- Self-reactive substances and mixtures
- Simple asphyxiates
- Substances and mixtures which, in contact with water emit flammable gases
- Physical hazards not otherwise classified

Health Hazards

The health hazards group includes the following hazard classes:

- Acute toxicity
- Aspiration hazard
- Biohazardous infectious materials
- Carcinogenicity
- Germ cell mutagenicity
- Reproductive toxicity
- Respiratory or skin sensitization
- Serious eye damage/eye irritation
- Skin corrosion/irritation
- Specific target organ toxicity
  - Single exposure
- Specific target organ toxicity
  - Repeated exposure
- Health hazards not otherwise classified
Hazard classes

A hazardous product is a product that falls into one or more of the hazard classes described below. Suppliers classify these products and assign one or more of the appropriate pictograms (symbols or graphic images surrounded by borders)

The following are only brief descriptions of each of the hazard classes

<table>
<thead>
<tr>
<th>Physical hazard class</th>
<th>General description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable gases; Flammable aerosols; Flammable liquids; Flammable solids</td>
<td>These four classes cover products that have the ability to ignite (catch fire) easily. The main hazards are fire or explosion.</td>
</tr>
<tr>
<td>Oxidizing gases; Oxidizing liquids; Oxidizing solids</td>
<td>These three classes cover oxidizers, which may cause or intensify a fire, or cause a fire or explosion.</td>
</tr>
<tr>
<td>Gases under pressure</td>
<td>This class includes compressed gases, liquefied gases, dissolved gases, and refrigerated liquefied gases. Compressed gases, liquefied gases, and dissolved gases are hazardous because of the high pressure inside the cylinder or container. The cylinder or container may explode if heated. Refrigerated liquefied gases are very cold and can cause severe cold (cryogenic) burns or injury.</td>
</tr>
<tr>
<td>Self-reactive substances and mixtures</td>
<td>These products may react on their own to cause a fire or explosion, or may cause a fire or explosion if heated.</td>
</tr>
<tr>
<td>Pyrophoric liquids; Pyrophoric solids</td>
<td>These products can catch fire very quickly (spontaneously) if exposed to air.</td>
</tr>
<tr>
<td>Self-heating substances and mixtures</td>
<td>These products may catch fire if exposed to air. These products differ from pyrophoric liquids or solids in that they will ignite only after a longer period of time or when in large amounts.</td>
</tr>
<tr>
<td>Substances and mixtures which, in contact with water, emit flammable gases</td>
<td>As the class name suggests, these products react with water to release flammable gases. In some cases, the flammable gases may ignite very quickly (spontaneously).</td>
</tr>
<tr>
<td>Physical hazard class</td>
<td>General description</td>
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<tr>
<td>-----------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Organic peroxides</td>
<td>These products are unstable, highly reactive, or explosive. They may cause a fire or explosion if heated.</td>
</tr>
<tr>
<td>Corrosive to metals</td>
<td>These products may be corrosive (chemically damaging or destructive) to metals.</td>
</tr>
<tr>
<td>Combustible dusts</td>
<td>This class is used to warn of products that are finely divided solid particles. If dispersed in air, the particles may catch fire or explode if ignited.</td>
</tr>
<tr>
<td>Simple asphyxiants</td>
<td>These products are gases that may displace (take the place of) oxygen in air and cause rapid suffocation.</td>
</tr>
<tr>
<td>Physical hazards not otherwise classified</td>
<td>This class is meant to cover any physical hazards that are not covered in any other physical hazard class. These hazards involve chemical reactions that result in serious injuries or deaths when the reactions occur. If a product is classified in this class, the hazard statement on the label and SDS will describe the nature of the hazard.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health hazard class</th>
<th>General description</th>
</tr>
</thead>
</table>
| Acute toxicity      | These products are fatal, toxic, or harmful if inhaled, if in contact with skin, or if swallowed.  
Acute toxicity refers to effects occurring following:  
• Skin contact or ingestion exposure to:  
  - A single dose, or  
  - Multiple doses given within 24 hours  
• An inhalation exposure of four hours  
• Acute toxicity could result from exposure to the product itself. It could also result from a product that, upon contact with water, releases a gaseous substance that can cause acute toxicity. |
<p>| Skin corrosion/irritation | This class covers products that cause severe skin burns (i.e., corrosion) and products that cause skin irritation. |
| Serious eye damage/eye irritation | This class covers products that cause serious eye damage (i.e., corrosion) and products that cause eye irritation. |</p>
<table>
<thead>
<tr>
<th>Health hazard class</th>
<th>General description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory or skin sensitization</td>
<td>A respiratory sensitizer is a product that may cause allergy or asthma symptoms or breathing difficulties if inhaled. A skin sensitizer is a product that may cause an allergic skin reaction.</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>This hazard class includes products that may cause or are suspected of causing genetic defects. Genetic defects are permanent changes (mutations) to body cells that can be passed on to future generations.</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>This hazard class includes products that cause or are suspected of causing cancer.</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>This hazard class includes products that may damage or are suspected of damaging fertility or the unborn child. Note: There is an additional category that includes products that may cause harm to breast-fed children.</td>
</tr>
<tr>
<td>Specific target organ toxicity – single exposure</td>
<td>This hazard class covers products that cause or may cause damage to organs (e.g., liver, kidneys, or blood) following a single exposure. This class also includes a category for products that cause respiratory irritation, drowsiness, or dizziness.</td>
</tr>
<tr>
<td>Specific target organ toxicity – repeated exposure</td>
<td>This hazard class covers products that cause or may cause damage to organs (e.g., liver, kidneys, or blood) following prolonged or repeated exposure.</td>
</tr>
<tr>
<td>Aspiration hazard</td>
<td>This hazard class is for products that may be fatal if they are swallowed and enter the airways.</td>
</tr>
<tr>
<td>Biohazardous infectious materials</td>
<td>These materials are micro-organisms (e.g., viruses, bacteria, or fungi), nucleic acids (e.g., DNA or RNA), or proteins that cause or are probable causes of infection, with or without toxicity, in humans or animals.</td>
</tr>
<tr>
<td>Health hazards not otherwise classified</td>
<td>This class covers products that are not included in any other health hazard class. These hazards occur following acute or repeated exposure and have adverse effects on the health of a person exposed to them – including injury or death. If a product is classified in this class, the hazard statement will describe the nature of the hazard.</td>
</tr>
</tbody>
</table>
Hazard categories

Each hazard class contains at least one category. The hazard categories are assigned a number (1, 2, etc.). Categories may also be called "types". Types are assigned an alphabetical letter (A, B, etc.). In a few cases, subcategories are also specified. Subcategories are identified with a number and a letter (for example 1A and 1B).

Some hazard classes have only one category (for example, "Corrosive to metals"). Others may have two categories (for example "Carcinogenicity"[cancer]) or three categories (for example "Oxidizing liquids"). There are a few hazard classes with five or more categories (for example "Organic peroxides").

The category tells you about how hazardous the product is (i.e., the severity of hazard).

- Category 1 is always the greatest level of hazard (i.e., it is the most hazardous within that class). If Category 1 is further divided, Category 1A within the same hazard class is a greater hazard than Category 1B.
- Category 2 within the same hazard class is more hazardous than Category 3, and so on.

There are a few exceptions to this rule. For example, for the "Gases under pressure" hazard class, the hazard categories are "Compressed gas," "Liquefied gas," "refrigerated liquefied gas," and "Dissolved gas." These classes relate to the physical state of the gas when packaged and do not describe the degree of hazard.

In addition, the "Reproductive toxicity" hazard class has a separate category called "Effects on or via lactation." "Effects on or via lactation" was not assigned a specific numbered category. Reproductive toxicity also has categories 1 and 2, which relate to effects on fertility and/or the unborn child. "Effects on or via lactation" is considered a different, but related hazard within the "Reproductive toxicity" class.
Overview of WHMIS 2015 PICTOGRAMS

Pictograms are graphic images that immediately show you what type of hazard a hazardous product presents. With a quick glance, you can see, for example, that the product is flammable, or if it might be a health hazard.

Most pictograms have a distinctive red, diamond-shaped border. Inside this border is a symbol that represents the potential hazard (fire, health hazard, corrosive, etc.). Together, the symbol and the border are referred to as a pictogram. Pictograms are assigned to specific hazard classes or categories.

The following table shows the pictograms. The name of each pictogram is in bold type. The words in the brackets describe the hazard.
Introducing the pictograms

Exploding bomb (for explosion or reactivity hazards)

Flame (for fire hazards)

Flame over circle (for oxidizing hazards)

Gas cylinder (for gases under pressure)

Corrosion (for corrosive damage to metals, as well as skin, eyes)

Skull and crossbones (can cause death or toxicity with short exposure to small amounts)

Health hazard (may cause or suspected of causing serious health effects)

Exclamation mark (may cause less serious health effects or damage the ozone layer)

Environment* (may cause damage to the aquatic environment)

Biohazardous infectious materials** (for organisms or toxins that can cause diseases in people or animals)

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* An environmental hazards group exists in the GHS. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and SDSs. Including information about environmental hazards is allowed by WHMIS 2015.

** The “Biohazardous infectious materials” hazard class is included in WHMIS 1988 but is not part of the GHS. This class has been retained in WHMIS 2015 to maintain worker protection.
How pictograms compare to WHMIS 1988 hazard symbols

In general, pictograms (at right) are similar to WHMIS 1988 hazard symbols (at left). Many of the inner symbols are almost identical. However, there are some new symbols (the ones within the "Health hazard," "Exploiting bomb," "Environment," and "Exclamation mark" pictograms, highlighted by dashed lines above right). And two symbols (in the "Materials causing other toxic effects" and "Dangerously reactive material" hazard symbols, highlighted by dotted lines above left) have been retired. In all but one case ("Biohazardous infectious materials"), the pictogram borders are red and diamond-shaped. And most pictograms are assigned to multiple hazard classes and categories.
How pictograms are used with WHMIS 2015 hazard classes and categories

The pictograms are associated with the hazard classes and categories as follows.

Table 6. Pictograms matched to classes and categories

<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Classes and categories</th>
</tr>
</thead>
</table>
| ![Flame Pictogram](image) | **The flame** pictogram is used for the following classes and categories:  
• Flammable gases (Category 1)  
• Flammable aerosols (Category 1 and 2)  
• Flammable liquids (Category 1, 2, and 3)  
• Flammable solids (Category 1 and 2)  
• Pyrophoric liquids (Category 1)  
• Pyrophoric solids (Category 1)  
• Pyrophoric gases (Category 1)  
• Self-heating substances and mixtures (Category 1 and 2)  
• Substances and mixtures which, in contact with water, emit flammable gases (Category 1, 2, and 3)  
• Self-reactive substances and mixtures (Types B*, C, D, E, and F)  
• Organic peroxides (Types B*, C, D, E, and F) |
| ![Flame Over Circle Pictogram](image) | **The flame over circle** pictogram is used for the following classes and categories:  
• Oxidizing gases (Category 1)  
• Oxidizing liquids (Category 1, 2, and 3)  
• Oxidizing solids (Category 1, 2, and 3) |
<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Classes and categories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The <strong>gas cylinder</strong> pictogram is used for the following classes and categories:</td>
</tr>
<tr>
<td></td>
<td>• Gases under pressure (Compressed gas, Liquefied gas, Refrigerated liquefied gas, and Dissolved gas)</td>
</tr>
<tr>
<td></td>
<td>The <strong>corrosion</strong> pictogram is used for the following classes and categories:</td>
</tr>
<tr>
<td></td>
<td>• Corrosive to metals (Category 1)</td>
</tr>
<tr>
<td></td>
<td>• Skin corrosion/irritation - Skin corrosion (Category 1, 1A, 1B, and 1C)</td>
</tr>
<tr>
<td></td>
<td>• Serious eye damage/eye irritation - Serious eye damage (Category 1)</td>
</tr>
<tr>
<td></td>
<td>The <strong>exploding bomb</strong> pictogram is used for the following classes and categories:</td>
</tr>
<tr>
<td></td>
<td>• Self-reactive substances and mixtures (Types A and B*)</td>
</tr>
<tr>
<td></td>
<td>• Organic peroxides (Types A and B*)</td>
</tr>
<tr>
<td></td>
<td>The <strong>skull and crossbones</strong> pictogram is used for the following classes and categories:</td>
</tr>
<tr>
<td></td>
<td>• Acute toxicity:</td>
</tr>
<tr>
<td></td>
<td>• Oral (Category 1, 2, and 3)</td>
</tr>
<tr>
<td></td>
<td>• Dermal (Category 1, 2, and 3)</td>
</tr>
<tr>
<td></td>
<td>• Inhalation (Category 1, 2, and 3)</td>
</tr>
<tr>
<td></td>
<td>The <strong>health hazard</strong> pictogram is used for the following classes and categories:</td>
</tr>
<tr>
<td></td>
<td>• Respiratory or skin sensitization - Respiratory sensitizer (Category 1, 1A, and 1B)</td>
</tr>
<tr>
<td></td>
<td>• Germ cell mutagenicity (Category 1, 1A, 1B, and 2)</td>
</tr>
<tr>
<td></td>
<td>• Carcinogenicity (Category 1, 1A, 1B, and 2)</td>
</tr>
<tr>
<td></td>
<td>• Reproductive toxicity (Category 1, 1A, 1B, and 2)</td>
</tr>
<tr>
<td></td>
<td>• Specific target organ toxicity - Single exposure (Category 1 and 2)</td>
</tr>
<tr>
<td></td>
<td>• Specific target organ toxicity - Repeated exposure (Category 1 and 2)</td>
</tr>
<tr>
<td></td>
<td>• Aspiration hazard (Category 1)</td>
</tr>
<tr>
<td>Pictogram</td>
<td>Classes and categories</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------</td>
</tr>
</tbody>
</table>
| ![Exclamation Mark](image1) | **The exclamation mark** pictogram is used for the following classes and categories:  
- Acute toxicity - Oral, Dermal, Inhalation (Category 4)  
- Skin corrosion/irritation - Skin irritation (Category 2)  
- Serious eye damage/eye irritation - Eye irritation (Category 2 and 2A)  
- Respiratory or skin sensitization - Skin sensitizer (Category 1, 1A, and 1B)  
- Specific target organ toxicity - Single exposure (Category 3) |
| ![Biohazardous Infectious Materials](image2) | **The biohazardous infectious materials** pictogram is used for the following classes and categories:  
- Biohazardous infectious materials (Category 1) |

* Both the flame and exploding bomb pictograms are used for “Self-reactive substances and mixtures” (Type B) and “Organic peroxides” (Type B).

**Note:** The “Physical hazards not otherwise classified” and “Health hazards not otherwise classified” classes are required to have a GHS pictogram that is appropriate to the hazard identified.
Hazard classes and categories without pictograms

Some hazardous products meet the criteria for hazard classes or categories but do not require pictograms. The product label and section 2 (Hazard identification) of the SDS still require the signal word, hazard statement(s) and other required label elements.

WHMIS 2015 classes and categories that do not require a pictogram are:

- Flammable gases – Category 2
- Flammable liquids – Category 4
- Self-reactive substances and mixtures – Type G
- Organic peroxides – Type G
- Combustible dusts – Category 1
- Simple asphyxiates – Category 1
- Serious eye damage/eye irritation – Eye irritation – Category 2B
- Reproductive toxicity – Effects on or via lactation

Where to find pictograms

Pictograms will be on the supplier labels of the hazardous products you work with. They will also be on the SDSs (as the symbol or words that describe the symbol).
LABELS
Labelling hazardous products

Under WHMIS 2015, hazardous products used in the workplace must be labelled. Labels are the first alert to users about the major hazards of these products. They also outline the basic precautions or safety steps that should be taken.

In most cases, suppliers are responsible for labelling the hazardous products that they provide to customers. Employers are responsible for:

- Making sure that hazardous products that come into the workplace are labelled.
- Preparing and applying workplace labels when appropriate.

Overview of label types

There are two main types of WHMIS labels: supplier labels and workplace labels.

A supplier label is provided or affixed (attached) by the supplier of the hazardous product. Supplier labels will appear on all hazardous products received at a workplace in Canada. If a hazardous product is always used in its original container with a supplier label, no other label is required.

A workplace label is required when any of the following apply:

- A hazardous product is produced (made) at the workplace and used in that workplace.
- A hazardous product is decanted (for example, transferred or poured) into another container.
- A supplier label becomes lost or illegible (unreadable)

In general, employers are responsible for providing workplace labels. Employers must also ensure that all labels at their workplace are legible and that they are replaced if damaged.

Workers must be educated to recognize and understand the information provided on supplier labels, workplace labels, and other means of identification (such as warning signs, colour codes, and placards).
Supplier labels

Supplier labels continue to be required in English and French. They may be bilingual (as one label), or available as two labels (one in English, and one in French).

Information required

A supplier label must include the following information:

1. Product Identifier – the brand name, chemical name, common name, generic name, or trade name of the hazardous product.
2. Initial supplier identifier – the name, address and telephone number of either the Canadian manufacturer or the Canadian importer.
3. Pictogram(s) – hazard symbol within a red, diamond-shaped border.
4. Signal word – a word used to alert the reader to a potential hazard and to indicate the severity of the hazard.
5. Hazard statement(s) – standardized phrases that describe the nature of the hazard posed by a hazardous product.
6. Precautionary statement(s) – standardized phrases that describe measures to be taken to minimize or prevent adverse effects resulting form:
   a. Exposure to a hazardous product, or
   b. Improper handling or storage of a hazardous product
7. Supplemental label information – may include supplementary information about precautionary actions, hazards not yet included in the GHS, physical state or route of exposure. This information must not contradict or detract from the standardized information. Also the label for mixtures containing ingredients with unknown toxicity in amounts higher than 1 percent must include a statement indicating the percent of the ingredient or ingredients with unknown toxicity.

* Initial supplier identifier – There are two exceptions to this requirement.
  - In a situation where a hazardous product is being sold by a distributor the distributor may replace the name, address and telephone number of the initial supplier with their own contact information.
  - In a situation where an importer imports a hazardous product for use in their own workplace in Canada (i.e., the importer is not selling the hazardous product), the importer may retain the name address and telephone number of the foreign supplier on the SDS instead of replacing it with their own contact information.
Format

There is no set format for a supplier label, but the pictogram(s) signal word and hazard statement(s) must be grouped together.

A supplier label must be:

- Clearly and prominently displayed on the container
- Easy to read (i.e., you can see it easily without using any item except corrective glasses)
- In contrast with other information on the product or container
- Bilingual (as one label or two)
About signal words

A signal word is a prompt that alerts you about the degree or level of hazard of the product. There are only two signal words used: Danger or Warning. "Danger" is used for high-risk hazards, while "Warning" is used for less-severe hazards. If a signal word is assigned to a hazard class and category, it must be shown on the label and listed in section 2 (Hazard Identification) of the safety data sheet (SDS).

About hazard statements

Each hazard class and category has an assigned "hazard statement." Hazard statements are brief, standardized sentences that tell you more about the exact hazard of the product. The statements are short, but they describe the most significant hazards of the product.

Examples of hazard statements are:

- Extremely flammable gas
- Contains gas under pressure; may explode if heated.
- Fatal if inhaled.
- Causes eye irritation.
- May cause cancer.

The wording of the hazard statement helps to describe the degree of the hazard. For example, "May cause cancer" is more hazardous than "Suspected of causing cancer."
About precautionary statements

Precautionary statements provide advice on how to minimize or prevent adverse effects resulting from exposure to a hazardous product or resulting from improper storage or handling of a hazardous product. These statements can include instructions about storage, handling, first aid, personal protective equipment and emergency measures. Like the hazard statements, the wording of precautionary statements is standardized and harmonized.

There are five types of precautionary statements:
- General
- Prevention
- Response (including first aid)
- Storage
- Disposal

Examples of precautionary statements are:
- Keep container tightly closed.
- Wear protective gloves/protective clothing/eye protection/face protection.
- If exposed or concerned: Get medical advice/attention
- Fight fire remotely due to the risk of explosion
- Protect from sunlight.

Precautionary statements will be consistent with the degree of the hazard associated with the product.

About slashes and dots on supplier labels

Slashes (/) and dots (…) are intended as instructions to the supplier to help them prepare the label and SDS.

For example, the guidance material from GHS lists the following precautionary statement: "Wear protective gloves/protective clothing/eye protection/face protection."

The slash (/) means the supplier is to specify the appropriate type of equipment based on their knowledge of the product and how it is used. So, for example, this statement could appear as:
- Wear protective gloves and eye protection. Or,
- Wear protective gloves. Or,
- Wear protective gloves, protective clothing, eye protection and face protection.

"Do not subject to grinding/shock/friction/..." is another example. In this case the supplier is to specify the application rough handling circumstance to avoid (grinding, shock, and/or friction), and the dots (…) mean they are to consider other types of rough handling that should be mentioned.
Updating supplier labels

Labels need to be updated when the supplier becomes aware of any "significant new data." Section 5.12(1) of the Hazardous Products Regulations defines significant new data as:

"...new data regarding the hazard presented by a hazardous product that change its classification in a category or subcategory of a hazard class, or result in its classification in another hazard class, or change the ways to protect against the hazard presented by the hazardous product."

Labels need to be updated within 180 days of the supplier being aware of the new information. If an employer purchases a product within this 180-day time period, the supplier must inform the employer of the changes and the date they became available, in writing.

Employer need to update the existing labels or the information on the containers as soon as the supplier provides the significant new information.

Sample supplier labels: WHMIS 1988 vs. WHMIS 2015
Two sample supplier labels are shown for comparison purposes: WHMIS 1988 (top) and WHMIS 2015 (bottom). In general, WHMIS 2015 supplier labels contain less information than their WHMIS 1988 counterparts. As a result, WHMIS 2015 supplier labels tend to be less cluttered.
Supplier label requirements for shipments

When a supplier ships a product, it will generally be transported in a single container, in a multi-container, or in bulk. If the product is in a single container, the supplier must apply the supplier label. If a number of inner containers are packaged into a multi-container shipment (such as a box or wrapped pallet), the supplier must apply labels on both the inner and outer containers unless there is a written agreement that the purchaser will apply the supplier labels to the inner containers. For bulk shipments, the supplier must send to the purchaser either a supplier label or the information required on a supplier label.

The Transportation of Dangerous Goods Act may require additional labels during transport. For multi-container shipments, a supplier label is not required on the outer container if a Transportation of Dangerous Goods label is present. Only the inner containers require supplier labels.

Employers are responsible for checking that supplier labels have been applied to the hazardous products received at their workplaces. With multi-container shipments, the employer must apply supplier labels to inner containers if the employer has agreed in writing to do so. With bulk shipments, the employer must apply the supplier labels provided. If the supplier sends labelling information instead of labels, the employer must develop and apply, at a minimum, a workplace label.

If a supplier label is missing when the product is received, or if the employer believes the label contains inaccurate information, the employer must temporarily store that product while he or she is actively seeking the information from the supplier or the manufacturer. The temporarily stored product cannot be handled or used until a proper label has been obtained.

If a supplier label later becomes illegible or is accidentally removed, the employer must replace the label with either a supplier label or a workplace label.
Workplace labels

A workplace label provides the following required information:

- A product identifier identical to the one found on the hazardous product's safety data sheet
- Safe handling information for the hazardous product
- A reference to the availability of an SDS (if applicable)

Workplace labels may include pictograms or other supplier label information.

Format

The format for workplace labels is fairly flexible. For example:

- The information can be written directly onto the container using a permanent marker.
- The language(s) used can be chosen to fit the specific workplace.

Sample workplace label

An example of a workplace label is shown below:

ACETONE
No smoking, sparks, or flames
Wear eye, face, and hand protection
Use in well ventilated area, or wear NIOSH approved respirator with organic vapour cartridges
Safety data sheet available

When workplace labels are required

As mentioned earlier, a workplace label is required when any of the following apply:

- A hazardous product is produced (made) at the workplace and used in that workplace.
- A hazardous product is decanted (for example, transferred or poured) into another container
- A supplier label becomes lost or illegible (unreadable)
In general, employers are responsible for providing workplace labels. Employers must also ensure that all labels at their workplace are legible and that they are replaced if damaged.

**When workplace labels are not required**

There are two situations when a workplace label is not necessary. When a hazardous product is:

- Poured into a container and will be used immediately, or
- Under the control of the person who decanted it.

For example, when the person who poured the product into another container will be the only person who will use it, and the product will be used during one shift, a full workplace label may not be required. However, the container must still be identified with the product identifier (name).

If the product is not used right away, or if more than one person will be in control of the product, a full workplace label is required. Not that a company may have specific rules about labelling containers that are above or exceed the WHMIS requirements.

**When employers produce hazardous products**

If an employer produces a hazardous product at a workplace, the employer must ensure that a workplace label is applied to the hazardous product or its container. (Note: "Produces" does not include the escape of a hazardous product from equipment or from another product.) However, a workplace label is not required if the hazardous product is in a container that is intended to contain the hazardous product for sale or distribution and the container is or is about to be appropriately labelled.

**Updating workplace labels**

An employer must update a workplace label for a hazardous product as soon as significant new data about the product is available to the employer.

Workplace label requirements fall under provincial or territorial jurisdiction, or under the *Canada Labour Code* in federally regulated workplaces.
What workers should do when using a hazardous product?

As a worker, you should do the following:

- Always check to see if there is a label on the product before you use it
- Read, understand and follow the instructions on the label and SDS. Follow any education, instructions and training your employer provides
- Ask your supervisor if you are not sure about how to use or store the product
- Ask for a new label when you can’t see or read the old one properly
- Don't use a product that is not labelled or if the label is unreadable. Ask your supervisor for help (for example, to replace the label).
About safety data sheets

Safety data sheets (SDSs) are summary documents that provide information about hazardous products and advise about safety precautions.

An SDS tells you what the hazards of a product are, how to use the product safely, what to expect if the recommendations are not followed, how to recognize symptoms of exposure and what to do if emergencies occur.

SDSs provide more-detailed hazard information about products than labels do. SDSs are important resources that help you learn more about the products you use. Use this information to identify more about the products you use. Use this information to identify:

- The hazards of the products you use
- How to protect yourself from those hazards
- Safe handling and emergency measures

SDSs are usually written by the manufacturer or supplier of a product. In some circumstances, an employer may be required to prepare an SDS (for example, when the product is produced and used exclusively in that workplace).

Every product that is classified as a hazardous product under WHMIS that is intended for use, handling, or storage in a workplace in Canada must have an SDS.

Format information required

WHMIS 2015 requires a standard 16 section SDS. All information on the SDS must appear in the specified order.
<table>
<thead>
<tr>
<th>SDS section and heading</th>
<th>Information requirements (partial list)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Identification</td>
<td>Product identifier, recommended use and restrictions on use, supplier contact information, emergency phone number.</td>
</tr>
<tr>
<td>2 Hazard identification</td>
<td>Classification (hazard class and category), label elements (including pictogram, signal word, hazard statements, and precautionary statements), and other hazards (e.g., thermal hazards).</td>
</tr>
<tr>
<td>3 Composition/Information on ingredients</td>
<td>For a hazardous product that is a substance: the chemical name, synonyms, Chemical Abstracts Service Number (CAS No.), and the chemical name of impurities, stabilizing solvents, and stabilizing additives where classified and that contribute to the classification of the product. For a hazardous product that is a mixture: for ingredients that present a health hazard, the chemical name, synonyms, CAS No., and concentration. Note: Confidential business information rules may apply (see page 70 for more information).</td>
</tr>
<tr>
<td>4 First-aid measures</td>
<td>First-aid measures by route of exposure (inhalation, skin contact, etc.) as well as most important symptoms/effects.</td>
</tr>
<tr>
<td>5 Fire-fighting measures</td>
<td>Suitable (and unsuitable) extinguishing media, specific hazards, special equipment and precautions for firefighters.</td>
</tr>
<tr>
<td>6 Accidental release measures</td>
<td>Protective equipment, emergency procedures, methods and materials for containment and cleanup.</td>
</tr>
<tr>
<td>7 Handling and storage</td>
<td>Precautions for safe handling, conditions for storage, including any incompatibilities.</td>
</tr>
<tr>
<td>8 Exposure controls/Personal protection</td>
<td>Exposure limits, engineering controls, personal protective equipment.</td>
</tr>
<tr>
<td>9 Physical and chemical properties</td>
<td>Appearance, odour, odour threshold, pH, melting/freezing point, boiling point and range, flash point, upper and lower flammable or explosive limits.</td>
</tr>
<tr>
<td>10 Stability and reactivity</td>
<td>Reactivity, chemical stability, possible hazardous reactions, conditions to avoid, incompatible materials, hazardous decomposition products.</td>
</tr>
</tbody>
</table>
Why SDSs can be difficult to understand

SDSs are complex and technical. SDSs have many different audiences, including occupational hygienists and safety professionals, employer, supervisors, nurses, doctors, emergency responders and workers.

To ensure that SDS users can quickly find the information they need, information directed toward these various users will be listed in specific sections. Having a set format will make it easier to find the information you need on every SDS.

However, workers may find some of the information on an SDS difficult to understand. Employers must be able to explain the content of the SDS to workers in order for them to work safely with or near hazardous products.
The following sample SDS shows information items for acetone.
Acetone
Safety Data Sheet

SECTION 1: Identification

Acetone (main constituent)

SECTION 2: Hazard identification

2.1. Physical hazards
None

2.4. Other hazards not contributing to the classification
None

SECTION 3: Composition/Information on ingredients

3.1. Substances

<table>
<thead>
<tr>
<th>Name</th>
<th>Product Identifier</th>
<th>%</th>
<th>WHMIS 2015 classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetone (main constituent)</td>
<td>CAS NO: 67-64-1</td>
<td>100</td>
<td>STOT SE 3, H336</td>
</tr>
</tbody>
</table>

Full list of H-phrases: see section 16

SECTION 4: First-aid measures

4.1. Description of first aid measures

First aid measures general

First aid measures after inhalation
Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First aid measures after skin contact
Wash immediately with lots of water. Soap may be used. Do not apply (chemical) neutralizing agents. Remove clothing before washing. Take victim to a doctor if irritation persists.

First aid measures after eye contact
Rinse immediately with plenty of water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

First aid measures after ingestion

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/Injuries
Not expected to present a significant hazard under anticipated conditions of normal use.

Symptoms/Injuries after inhalation

Symptoms/Injuries after skin contact
ONCONTINUOUS EXPOSURE/CONTACT: Dry skin. Cracking of the skin.

Symptoms/Injuries after eye contact
Irritation of the eye tissue.

Symptoms/Injuries after ingestion

Symptoms/Injuries upon intravenous administration
NOT TO BE INJECTED!

Chronic symptoms

4.3.Indication of any immediate medical attention and special treatment needed
Obtain medical assistance.

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media

Unsuitable extinguishing media
Solid water jet ineffective as extinguishing medium.

5.2. Special hazards arising from the substance or mixture

Fire hazard
DIRECT FIRE HAZARD. Highly flammable. Gas/vapour flammable with air within explosion limits. INDIRECT FIRE HAZARD. May be ignited by sparks. Gas/vapour spreads at floor level. Ignition hazard. Reactions involving a fire hazard: see "Reactivity Hazard."

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Explosion hazard: DIRECT EXPLOSION HAZARD. Gas/vapour explosive with air within explosion limits. INDIRECT EXPLOSION HAZARD. Heat may cause pressure rise in tanks/drum; explosion risk may be ignited by sparks. Reactions with explosion hazards: see "Reactivity Hazard". Upon combustion, CO and CO2 are formed. Violent to explosive reaction with many compounds. Prolonged storage: on exposure to light; release of harmful gases/vapours. Reacts violently with (strong) oxidisers: peroxidation resulting in increased fire or explosion risk.

5.3. Advice for firefighters:
Firefighting instructions: Cool tanks/drums with water spray to move them into safety. Physical explosion risk: extinguish fire from behind cover. Do not move the load if exposed to heat. After cooling: Heat/fire exposure; compressed air/oxygen apparatus.

SECTION 6: Accidental release measures
6.1. Personal precautions, protective equipment and emergency procedures
6.1.1. For non-emergency personnel
Protective equipment: Protective clothing. Large spills in enclosed spaces: compressed air apparatus.

6.1.2. For emergency responders
Protective equipment: Equipment cleanup crew with proper protection.
Emergency procedures: Ventilate area.

6.2. Environmental precautions
Prevent spreading in sewers.

6.3. Methods and material for containment and cleaning up
For containment: Contain released substance, pump into suitable containers. Consult "Material-handling" to select material of containers. Plug leak, cut off supply. Dam up the liquid spill. Try to reduce evaporation. Measure the concentration of the explosive gas/vapour mixture. Dilute/destroy combustible gas/vapour with water curtain. Provide equipment/equipments with earthing. Do not use compressed air for pumping over spills.
Methods for cleaning up: Take up liquid spill into inert absorbent material, e.g. sand, earth, vermiculite. Scoop absorbed substance into closing containers. See "Material-handling" for suitable container materials. Spill must not return in its original container. Carefully collect the spill. Damaged/leaked tanks must be emptied. Do not use compressed air for pumping over spills. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

6.4. Reference to other sections
See Section 8: Exposure controls and personal protection.

SECTION 7: Handling and storage
7.1. Precautions for safe handling
Precautions for safe handling: Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Handle unsealed empty containers as full ones. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Do not use compressed air for pumping over. Use spark-resistant proof appliances and lighting system. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Avoid prolonged and repeated contact with skin. Keep container tightly closed. Measure the concentration in the air regularly. Work under local exhaust/ventilation.

Hygiene measures: Do not eat, drink or smoke when using this product. Wash contaminated clothing before reuse. Wash hands and other exposed areas with soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities
Storage conditions: Keep only in the original container in a cool, well-ventilated place away from: Heat sources. Direct sunlight. Incompatible materials. Keep container closed when not in use.
Incompatible products: Strong bases. Strong acids.
Incompatible materials: Sources of ignition. Direct sunlight.
Storage temperature: 10 - 20 °C.
Heat and ignition sources: KEEP SUBSTANCE AWAY FROM heat sources, ignition sources.
Prohibitions on mixed storage: KEEP SUBSTANCE AWAY FROM oxidizing agents, reducing agents, (strong) acids, (strong) bases, halogens, amines.
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Safety Data Sheet

Storage area:
Store in a cool area. Keep out of direct sunlight. Store in a dry area. Store in a dark area.
Ventilation at floor level. Fireproof storeroom. Provide for an automatic sprinkler system.
Provide for a tub to collect spills. Provide the tank with earthing. Meet the legal requirements.

Special rules on packaging:
SPECIAL REQUIREMENTS: closing with pressure relief valve, clean, opaque, correctly
labelled. Meet the legal requirements. Secure fragile packagings in solid containers.

Packaging materials:
SUITABLE MATERIAL: steel, stainless steel, carbon steel, aluminium, iron, copper, nickel,
bronze, glass. MATERIAL TO AVOID: synthetic material.

7.3 Specific end use(s)
No additional information available

SECTION 8: Exposure controls/Personal protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Acetone (67-64-1)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TWA (ppm)</td>
<td>25 ppm</td>
</tr>
<tr>
<td>STEL (ppm)</td>
<td>500 ppm</td>
</tr>
<tr>
<td>TLV (ppm)</td>
<td>850 ppm</td>
</tr>
<tr>
<td>STEL (ppm)</td>
<td>750 ppm</td>
</tr>
<tr>
<td>OSHA PEL (TWA) (mg/m³)</td>
<td>2400 mg/m³</td>
</tr>
<tr>
<td>OSHA PEL (TWA) (ppm)</td>
<td>1300 ppm</td>
</tr>
</tbody>
</table>

6.2. Exposure controls
Emergency eye wash fountains and safety showers should be available in the immediate vicinity
of any potential exposure.

Materials for protective clothing
- GIVES EXCELLENT RESISTANCE: No data available. GIVES GOOD RESISTANCE: butyl
rubber, tetrafluoroethylene. GIVES LESS RESISTANCE: chlorosulfonated polyethylene, natural
rubber, neoprene, polyethylene, PVA, styrene-butadiene rubber. GIVES POOR RESISTANCE:
nitrile rubber, polyethylene, PVC, vulcanized nitrile rubber/PVC.

Hand protection:
Gloves (see information above).

Eye protection:
Protective goggles.

Skin and body protection:
Head/neck protection, Protective clothing.

Respiratory protection:
Wear half mask respirator with Organic Vapour cartridges as a minimum.

Other information:
Do not eat, drink or smoke during use.

SECTION 9: Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Liquid.
Appearance: Liquid.
Molecular mass: 58.08 g/mol
Colour: Colourless.
Odour threshold: 0.05 - 0.65 ppm
pH: 7
Relative evaporation rate (butylacetate=1): 6
Relative evaporation rate (ether=1): 2
Melting point: -96 ºC
Freezing point: -98 ºC
Boiling point: 56 ºC
Flash point: 15 ºC
Critical temperature: 220 ºC
Self ignition temperature: 405 ºC
Decomposition temperature: No data available
Flammability (solid, gas): No data available
Vapour pressure: 247 hPa
Vapour pressure at 50 ºC: 826 hPa
Critical pressure: 47310 hPa
Relative vapour density at 20 ºC: 2.0
Relative density: 0.79
Relative density of saturated gas mixture: 1.2

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Density: 750 kg/m³

Log Pow: -0.24 (Test data)
Log Kow: No data available
Viscosity, kinematic: 0.017 mm²/s
Viscosity, dynamic: 0.0033 Pa.s
Explosive properties: No data available
Oxidizing properties: None
Explosive limits: 2 - 12.5 vol %, 60 - 310 glm³

3.1. Other information
Minimum igniton energy: 1.15 mJ
Specific conductivity: 50,0000 pF/m
Saturation concentration: 580 glm³
VOC content: 100%
Other properties: Gas/vapour heavier than air at 20°C. Clear. Highly volatile. Substance has neutral reaction.

SECTION 10: Stability and reactivity

10.1. Reactivity
Upon combustion: CO and CO₂ are formed. Violent to explosive reaction with many compounds. Prolonged storage or exposure to light releases harmful gases/vapours. Reacts violently with (strong) oxidizers. Peroxidation resulting in increased fire or explosion risk.

10.2. Chemical stability
Unstable on exposure to light.

10.3. Possibility of hazardous reactions
Not established.

10.4. Conditions to avoid
Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials
Strong acids. Strong bases.

10.6. Hazardous decomposition products
Carbon monoxide. Carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity: Not classified

Acute oral (f): 5000 mg/kg (Rat, Experimental value; Rat, Experimental value)
LD₅₀ oral rat: 5000 mg/kg (Rat, Experimental value; Rat, Experimental value)
LD₅₀ dermal rabbit: 20000 mg/kg (Rabbit, Experimental value; Rabbit, Experimental value)
LC₅₀ inhalation rat (mg/l): 71 mg/l/4h (78 mg/l/4h; Rat, Experimental value; Experimental value, experimental value)
LC₅₀ inhalation rat (ppm): 30000 ppm (Rat, Experimental value; Rat, Experimental value)

Skin corrosion/irritation: Not classified pH: 7
Serious eye damage/irritation: Causes serious eye irritation. pH: 7.
Respiratory or skin sensitisation: Not classified
Genotoxicity: Not classified
Carcinogenicity: Based on available data, the classification criteria are not met.
Reproductive toxicity: Not classified
Specific target organ toxicity (single exposure): May cause drowsiness or dizziness.
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Specific target organ toxicity (repeated exposure)
Not classified

Aspiration hazard
Not classified

Potential adverse human health effects and symptoms

Symptoms/Injuries after inhalation
ONCONTINUOUS EXPOSURE/CONTACT: Dry skin. Cracking of the skin. Irritation of the eye. Inflammation of the conjunctiva.

Symptoms/Injuries after skin contact

Symptoms/Injuries after eye contact

Symptoms/Injuries after ingestion

Chronic symptoms

SECTION 12: Ecological Information

12.1. Toxicity

Ecology - general
Classification concerning the environment: not applicable.

Ecology - air
TLU Lüft Klasse 5.3.5

Ecology - water
Not harmful to fishes (LC50 > 1000 mg/l). Not harmful to invertebrates (Daphnia). Not harmful to algae (EC50 > 1000 mg/l). Not harmful to plankton. Inhibition of activated sludge.

<table>
<thead>
<tr>
<th>Acetone (67-64-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1</td>
</tr>
<tr>
<td>LC50 Daphnia 1</td>
</tr>
<tr>
<td>LC50 fish 2</td>
</tr>
<tr>
<td>TLM fish 1</td>
</tr>
<tr>
<td>TLM fish 2</td>
</tr>
<tr>
<td>Threshold limit other aquatic organisms 1</td>
</tr>
<tr>
<td>Threshold limit other aquatic organisms 2</td>
</tr>
<tr>
<td>Threshold limit algae 1</td>
</tr>
<tr>
<td>Threshold limit algae 2</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

Acetone (67-64-1)
Persistence and degradability
Readily biodegradable in water. Biodegradable in the soil. Biodegradable in the soil under anaerobic conditions. No test data on mobility of the substance available.

Biochemical oxygen demand (BCOD)
1.41 g O2/g substance

Chemical oxygen demand (COD)
1.92 g O2/g substance

ThOD
2.26 g O2/g substance

12.3. Bioaccumulative potential

Acetone (67-64-1)
BCF fish 1
0.09 (Poecilia)

Log Pow
-0.24 (Test data)

Bioaccumulative potential
Not bioaccumulative.

12.4. Mobility in soil

Acetone (67-64-1)
Surface tension
0.0237 N/m

12.5. Other adverse effects

Other information
Avoid release to the environment.

### Acetone

**Safety Data Sheet**

#### SECTION 13: Disposal considerations

**13.1 Waste treatment methods**
Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together; if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Recycle by distillation. Remove to an authorized waste incinerator for solvents with energy recovery. Do not discharge into drains or the environment.

**Additional information**
- LWDA (the Netherlands): IGAA category 03. Hazardous waste according to Directive 2008/98/EC.
- Avoid release to the environment.

**Ecology - waste materials**
- LWDA (the Netherlands): IGAA category 03. Hazardous waste according to Directive 2008/98/EC.
- Avoid release to the environment.

#### SECTION 14: Transportation Information

**14.1 UN number**
- UN No. (DOT) 1000
- DOT NA no. UN1099

**14.2 UN proper shipping name**
- Acetone

**DOT Proper Shipping Name**
- Acetone

**Department of Transportation (DOT) Hazard Classes**
- 3 - Class 3 - Flammable and combustible liquid 49 CFR 172.101

**Hazard labels (DOT)**
- 3 - Flammable liquids

**Packing group (DOT)**
- II - Medium Danger

**DOT Special Provisions (49 CFR 172.102)**
- IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31H21). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50°C (1.1 bar at 122°F), or 130 kPa at 55°C (1.1 bar at 131°F) are authorized.

**DOT Packaging Exceptions (49 CFR 173.40)**
- 160

**DOT Packaging Non-Bulk (49 CFR 173.30)**
- 202

**DOT Packaging Bulk (49 CFR 173.30)**
- 242

**14.3 Additional information**
- No supplementary information available.

**State during transport (ADR/RID)**
- as liquid.

**Overland transport**

**Packing group (ADR)**
- II

**Class (ADR)**
- 3 - Flammable liquids

**Hazard identification number (Kendler No.)**
- 33

**Classification codes (ADR)**
- F1

**Danger labels (ADR)**
- 3 - Flammable liquids

**Orange plates**

**133**

**1090**

**Tunnel restriction codes**
- 6/D/IE

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Transport by sea

DOT Vessel Stowage Location:
B - (i) The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or nine passengers per each 3 m of overall vessel length, and (ii) "On deck only" on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.

EmS-No. (1):
F-E
EmS-No. (2):
G-D

Air transport

DOT Quantity Limitations Passenger aircraft only (49 CFR 175.37) 5 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) 80 L

SECTION 16: Regulatory information

15.1. US Federal regulations

Acetone (87-66-2)
Listed on the United States TSCA (Toxic Substances Control Act) Inventory
RG (Reportable quantity, section 304 of EPA's List of Lists): 5000 lb

EU-Regulations
No additional information available

Classification according to Regulation (EC) No. 1907/2006 [CLP]
Flam. Liq. 2 H226 Eye Irrit. 2 H319 STOT SE 3 H338
Full text of H-phrases: see section 10

Classification according to Directive 90/429/EEC or 1999/45/EC
F.R11:1) R36 R66 R67
Full text of H-phrases: see section 10

12.2. US State regulations
No additional information available

SECTION 16: Other information

Full text of H-phrases:

| Eye Irrit. 2A | Serious eye damage/eye irritation. Category 2A |
| Flam. Liq. 2 | Flammable liquids, Category 2 |
| STOT SE 3 | Specific target organ toxicity — Single exposure. Category 3, Narcosis |
| H225 | Highly flammable liquid and vapour |
| H316 | Causes serious eye irritation |
| H336 | May cause drowsiness or dizziness |

NFPA health hazard
NFPA fire hazard
NFPA reactivity

1 - Exposure could cause irritation but only minor residual injury even if no treatment is given.
3 - Liquids and solids that can be ignited under almost all ambient conditions.
0 - Normally stable, even under fire exposure conditions, and are not reactive with water.

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HMIS III Rating
Health 1 Slight Hazard - Irritation or minor reversible injury possible
Flammability 3 Serious Hazard
Physical 0 Minimal Hazard
Personal Protection C

SDS US (GHS HazCom 2012)

Information in this SDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and Rappter Chemicals LLC assumes no liability resulting from the use of this SDS. The user must determine suitability of this information for its application.
When workers should use SDSs

As a worker, you should keep the following points in mind.

Always be familiar with the hazards of a product **before** you start using it.

- Look at an SDS and match the name of the product on the container to the one on the SDS (Section 1)
- Know the hazards (Section 2)
- Understand safe handling and storage instructions (Section 7)
- Understand what to do in an emergency (Sections 4, 5 and 6)

You can think of the SDS as having four main purposes. It provides information on:

- **Identification** – for the product and supplier
- **Hazards** – physical (fire and reactivity) and health
- **Prevention** – steps you can take to work safely and reduce or prevent exposure
- **Response** – appropriate responses in various emergency situations (for example, first aid, fire or accidental release)

A few things to know:

- Make sure that the product is being used in the way the manufacturer intended. Otherwise the advice provided on the SDS and label may not apply, or the protective measures listed may not be adequate. Section 1 of the SDS should describe the typical use of the product and may indicate restrictions. Ask your supervisor or a health and safety professional for advice if the way you use the product does not match the SDS.
- Section 2 will summarize the hazards related to the product, precautions to take and what to do in an emergency. The SDS covers information about the potential hazards, but it may not be specific about the required safe work procedures needed for your workplace. (For example, the SDS may not specify what type of respirator must be used, just that a respirator is needed.) Ask your supervisor for more information. These decisions may require the help of a safety professional or someone with chemical safety knowledge.

The meaning of a "generic chemical identity" on an SDS

This listing indicates that the supplier has applied to have the exact ingredients in the hazardous product considered as **confidential business information (CBI)**. There is a strict process that must be followed to have an ingredient or ingredients considered as confidential business information. Approval is only granted by Health Canada.

For example, a CBI claim may be granted if stating the ingredient name on the SDS would give competitors of that product financial gain and/or there was a significant cost to the development of the product.
Each claim is given a Registry Number. The Registry Number and approval or filing date must be shown on the SDS. IF the name of an ingredient is claimed as CBI, a generic chemical identity must be listed, as well as all physical or health hazard information, preventative measures and first aid.

While the ingredients may not be disclosed on the SDS, there is a requirement that the supplier must disclose the name of the ingredient to a safety or health professional, for example, in an emergency.

**MSDS headings vs. SDS headings**

The following table compares the section headings of "old" sample MSDSs against the hearings of SDSs. Note that there was no set format for MSDSs, but the SDS format is standardized. The MSDS headings shown are taken from forms on worksafebc.com.

<table>
<thead>
<tr>
<th>9-section MSDS headings</th>
<th>16-section MSDS headings</th>
<th>16-section WHMIS 2015 SDS headings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Product information</td>
<td>1 Chemical product and company identification</td>
<td>1 Identification</td>
</tr>
<tr>
<td>2 Hazardous ingredients</td>
<td>2 Composition/Information on ingredients</td>
<td>2 Hazard identification</td>
</tr>
<tr>
<td>3 Physical data</td>
<td>3 Hazards identification</td>
<td>3 Composition/Information on ingredients</td>
</tr>
<tr>
<td>4 Fire and explosion data</td>
<td>4 First aid measures</td>
<td>4 First-aid measures</td>
</tr>
<tr>
<td>5 Reactivity data</td>
<td>5 Fire fighting measures</td>
<td>5 Fire-fighting measures</td>
</tr>
<tr>
<td>6 Toxicological properties</td>
<td>6 Accidental release measures</td>
<td>6 Accidental release measures</td>
</tr>
<tr>
<td>7 Preventive measures</td>
<td>7 Handling and storage</td>
<td>7 Handling and storage</td>
</tr>
<tr>
<td>8 First aid measures</td>
<td>8 Exposure control/ Personal protection</td>
<td>8 Exposure controls/ Personal protection</td>
</tr>
<tr>
<td>9 Preparation information</td>
<td>9 Physical and chemical properties</td>
<td>9 Physical and chemical properties</td>
</tr>
<tr>
<td>10 Stability and reactivity</td>
<td>10 Stability and reactivity</td>
<td>10 Stability and reactivity</td>
</tr>
<tr>
<td>11 Toxicological information</td>
<td>11 Toxicological information</td>
<td>11 Toxicological information</td>
</tr>
<tr>
<td>12 Ecological information</td>
<td>12 Ecological information*</td>
<td>12 Ecological information*</td>
</tr>
<tr>
<td>13 Disposal considerations</td>
<td>13 Disposal considerations*</td>
<td>13 Disposal considerations*</td>
</tr>
<tr>
<td>14 Transport information</td>
<td>14 Transport information*</td>
<td>14 Transport information*</td>
</tr>
<tr>
<td>15 Regulatory information</td>
<td>15 Regulatory information*</td>
<td>15 Regulatory information*</td>
</tr>
<tr>
<td>16 Other information</td>
<td></td>
<td>16 Other information</td>
</tr>
</tbody>
</table>

*Sections 12 – 15 require the headings to be present, but under Canadian regulations, the supplier has the option to not provide information in these sections.
Updating SDSs

SDSs are required to be accurate at the time of sale or import. An SDS needs to be updated when the supplier becomes aware of any "significant new data".

This means that an SDS must be updated when:

- There is new information that changes how the hazardous product is classified, or
- There are changes to the way you should handle or store the product, or to the way you should protect yourself from the hazards of the product

SDSs need to be updated within 90 days of the supplier being aware of the new information. If you purchase a product within this 90-day time period, the supplier must inform you of the significant new data and the date on which it became available in writing.

How to find out if an SDS has been updated

Every SDS must provide a date of last revision in Section 16 (Other information). You will know if an SDS has been updated by checking this date and comparing it to the one on any previous SDS you have.

Confidential business information ("trade secrets")

Confidential business information (CBI) refers to specific product information that suppliers or employers who are manufacturers are permitted to withhold from an SDS or label for a period of three years. In the United States, CBI may be called trade secrets or proprietary information. Under WHMIS, a supplier can make a request to Health Canada to protect certain information that gives a company an economic advantage over competitors. Crucial information such as health hazards may never be withheld.

Types of information that may be granted this exemption are:

- Chemical identify
- Concentration of ingredients
- Information that can be used to identify an ingredient, such as a toxicological study
- Information that can be used to identify the hazardous product
- Information that can be used to identify the supplier of the hazardous product

If the term "trade secret" or "proprietary information" appears on an SDS, it must have a registration number and date. The following are examples of statements you may see:

- While a CBI claim is being processed: Filed with Health Canada on July 20, 2015; file number 1938
- After a CBI claim has been granted: CBI claim #1938, granted on August 20, 2015
When information is needed for emergency or first aid treatment, a supplier or employer must immediately disclose – in confidence – to a treating physician or nurse, the specific chemical identity and other necessary information about a hazardous product protected by a trade secret claim. In addition, an officer of Health Canada may disclose – in confidence – withheld information to agencies responsible for occupational health and safety.

For more information on confidential business information and WHMIS, consult the *Hazardous Materials Information Review Act and Regulations*, or contact Health Canada.
Education and Training
About WHMIS education and training for workers

Under WHMIS 2015, education and training can be thought of as two separate parts:

- **Education** refers to general information such as:
  - How WHMIS works
  - The major hazards of the hazardous products in use in the workplace
  - The rights and responsibilities of employers and worker
  - The content required on labels and SDSs and the significance of this information

- **Training** refers to the site – and job-specific information to employees that will cover your workplace's procedures for storage, handling, use, disposal, emergencies, spills and what to do in unusual situations.

Who should receive education and training?

If a workplace uses hazardous products, a WHMIS program must be in place. Workers must be educated and trained so they understand the hazards and know how to work safely with hazardous products.

All workers who work with a hazardous product, or who may be exposed to a hazardous product as part of their work activities, must learn about the hazard information for these products. (For example, a receptionist at a dental office may be exposed to mercury if it is spilled.) The hazard information should include the information received from the supplier, as well as any other information that the employer is aware of about the use, storage and handling of each product.

As an example, this education and training will include all workers who:

- May be exposed to a hazardous product due to their work activities (including normal use, maintenance activities or emergencies)
- Use, store, handle or dispose of a hazardous product
- Supervise or manage workers who may be exposed, or use, store, handle or dispose of a hazardous product
- Are involved in emergency response

Who should provide the education and training?

WHMIS legislation places the obligation for education and training with the employer and it outlines the minimum requirements for education and training. This education and training may be provided by the employer or by a qualified person or agency chosen by the employer. Regardless of who delivers the education and training, employers remain legally responsible to ensure the protection of workers.
Topics to be covered

Examples of topics that should be covered during education and training include:

- The information on both supplier labels and workplace labels and what that information means
- The information on the safety data sheet (SDS) and what that information means.
- The procedures required for safe use, handling and disposal of a hazardous product
- Any other information required when the product is in a pipe, piping system, vessel, tank, car, etc.
- Procedures to follow if the hazardous product may be present in the air and a worker may be exposed
- All procedures that must be followed in an emergency that involves the hazardous product.
Tables
# WHMIS 2015 Information items on a supplier label

<table>
<thead>
<tr>
<th>Information item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Product identifier</td>
<td>The brand name, chemical name, common name, generic name, or trade name of the hazardous product.</td>
</tr>
<tr>
<td>2 Initial supplier identifier</td>
<td>The name, address, and telephone number of either the Canadian manufacturer or the Canadian importer.*</td>
</tr>
<tr>
<td>3 Pictogram(s)</td>
<td>Hazard symbol within a red, diamond-shaped border.</td>
</tr>
<tr>
<td>4 Signal word</td>
<td>A word used to alert the reader to a potential hazard and to indicate the severity of the hazard.</td>
</tr>
<tr>
<td>5 Hazard statement(s)</td>
<td>Standardized phrases that describe the nature of the hazard posed by a hazardous product.</td>
</tr>
<tr>
<td>6 Precautionary statement(s)</td>
<td>Standardized phrases that describe measures to be taken to minimize or prevent adverse effects resulting from:</td>
</tr>
<tr>
<td></td>
<td>- Exposure to a hazardous product, or</td>
</tr>
<tr>
<td></td>
<td>- Improper handling or storage of a hazardous product</td>
</tr>
<tr>
<td>7 Supplemental label information</td>
<td>Labels may include supplementary information about precautionary actions, hazards not yet included in the GHS, physical state, or route of exposure. This information must not contradict or detract from the standardized information. Also, the label for mixtures containing ingredients with unknown toxicity in amounts higher than 1 percent must include a statement indicating the percent of the ingredient or ingredients with unknown toxicity.</td>
</tr>
</tbody>
</table>

* Initial supplier identifier – There are two exceptions to this requirement:                                                            |
  - In a situation where a hazardous product is being sold by a distributor, the distributor may replace the name, address, and telephone number of the initial supplier with their own contact information. |
  - In a situation where an importer imports a hazardous product for use in their own workplace in Canada (i.e., the importer is not selling the hazardous product), the importer may retain the name, address, and telephone number of the foreign supplier on the SDS instead of replacing it with their own contact information.
# Information items on a SDS (full list)

<table>
<thead>
<tr>
<th>SDS section and heading</th>
<th>Specific information elements</th>
</tr>
</thead>
</table>
| 1 Identification        | • Product identifier (e.g., product name)  
                           • Other means of identification (product family, synonyms, etc.)  
                           • Recommended use  
                           • Restrictions on use  
                           • Canadian supplier identifier\(^b\)  
                           - Name, full address, and phone number(s)  
                           • Emergency telephone number and any restrictions on the use of that number, if applicable |
| 2 Hazard identification | • Hazard classification (class, category) of substance or mixture, or a description of the identified hazard for Physical or Health Hazards Not Otherwise Classified  
                           • Label elements:  
                             - Pictogram or the name of the pictogram (e.g., flame; skull and crossbones)  
                             - Signal word  
                             - Hazard statement(s)  
                             - Precautionary statement(s)  
                           • Other hazards which do not result in classification (e.g., molten metal hazard) |
| 3 Composition/Information on ingredients | • When a hazardous product is a material or substance:  
                                           - Chemical name  
                                           - Common name and synonyms  
                                           - Chemical Abstracts Service (CAS) registry number and any unique identifiers  
                                           - Chemical name of impurities, stabilizing solvents and/or additives\(^*\)  
                                           • For each material or substance in a mixture that is classified in a health hazard class\(^{**}\):  
                                             - Chemical name  
                                             - Common name and synonyms  
                                             - CAS registry number and any unique identifiers  
                                             - Concentration |

**NOTE:** Confidential business information rules can apply.
<table>
<thead>
<tr>
<th>SDS section and heading</th>
<th>Specific information elements</th>
</tr>
</thead>
</table>
| 4 First-aid measures    | • First-aid measures by route of exposure:  
  - Inhalation  
  - Skin contact  
  - Eye contact  
  - Ingestion  
  • Most important symptoms and effects (acute or delayed)  
  • Immediate medical attention and special treatment, if necessary |
| 5 Fire-fighting measures| • Suitable extinguishing media  
  • Unsuitable extinguishing media  
  • Specific hazards arising from the hazardous product (e.g., hazardous combustion products)  
  • Special protective equipment and precautions for firefighters |
| 6 Accidental release measures | • Personal precautions, protective equipment, and emergency procedures  
  • Methods and materials for containment and cleaning up |
| 7 Handling and storage | • Precautions for safe handling  
  • Conditions for safe storage (including incompatible materials) |
| 8 Exposure controls/Personal protection | • Control parameters, including occupational exposure guidelines or biological exposure limits and the source of those values  
  • Appropriate engineering controls  
  • Individual protection measures (e.g., personal protective equipment) |
<table>
<thead>
<tr>
<th>SDS section and heading</th>
<th>Specific information elements</th>
</tr>
</thead>
</table>
| 9 Physical and chemical properties | - Appearance (physical state, colour, etc.)  
- Odour  
- Odour threshold  
- pH  
- Melting point / Freezing point  
- Initial boiling point / boiling range  
- Flash point  
- Evaporation rate  
- Flammability (solid; gas)  
- Lower flammable/explosive limit  
- Upper flammable/explosive limit  
- Vapour pressure  
- Vapour density  
- Relative density  
- Solubility  
- Partition coefficient – n-octanol/water  
- Auto-ignition temperature  
- Decomposition temperature  
- Viscosity |
| 10 Stability and reactivity | - Reactivity  
- Chemical stability  
- Possibility of hazardous reactions  
- Conditions to avoid (e.g., static discharge, shock, or vibration)  
- Incompatible materials  
- Hazardous decomposition products |
| 11 Toxicological information | Concise but complete description of the various toxic health effects and the data used to identify those effects, including:  
- Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact)  
- Symptoms related to the physical, chemical, and toxicological characteristics  
- Delayed and immediate effects, and chronic effects from short-term and long-term exposure  
- Numerical measures of toxicity |
<table>
<thead>
<tr>
<th>SDS section and heading</th>
<th>Specific information elements</th>
</tr>
</thead>
</table>
| 12 Ecological information*** | - Ecotoxicity  
- Persistence and degradability  
- Bioaccumulative potential  
- Mobility in soil  
- Other adverse effects |
| 13 Disposal considerations*** | Information on safe handling for disposal and methods of disposal, including any contaminated packaging |
| 14 Transport information*** | - UN number  
- UN proper shipping name  
- Transport hazard class(es)  
- Packing group  
- Environmental hazards  
- Transport in bulk, if applicable  
- Special precautions |
| 15 Regulatory information*** | Safety, health, and environmental regulations specific to the product |
| 16 Other information | Date of the latest revision of the SDS |

+ The supplier that must be identified on an SDS is the initial supplier identifier (i.e., the name, address, and telephone number of either the Canadian manufacturer or the Canadian importer). There are two exceptions to this requirement. In a situation where a hazardous product is being sold by a distributor, the distributor may replace the name, address, and telephone number of the initial supplier with their own contact information. In a situation where an importer imports a hazardous product for use in their own workplace in Canada (i.e., the importer is not selling the hazardous product), the importer may retain the name, address, and telephone number of the foreign supplier on the SDS instead of replacing it with their own contact information.

* These impurities and stabilizing products are those that are classified in a health hazard class and contribute to the classification of the material or substance.

** Each ingredient in the mixture must be listed when it is classified in a health hazard class and:
- Is present above the concentration limit that is designated for the hazard class in which it is classified, or
- Is present in the mixture at a concentration that results in the mixture being classified in any health hazard class

*** Sections 12 to 15 require the headings to be present, but under Canadian regulations, the supplier has the option to not provide information in these sections.
BEFORE YOU START USING HAZARDOUS MATERIALS, ASK YOURSELF.....

1. *What are the hazards of the materials I work with or around?*

2. *How am I protected?*

3. *What do I do in an emergency?*

4. *Where can I get more information?*

    *

    *

    *

    *