Saint Joseph's College

Hazard Communication Program

Your Right to Know

Table of Contents

SAINT JOSEPH'S COLLEGE POLICY

SAFETY IN THE WORKPLACE

It is the policy of Saint Joseph's College to comply with all Federal and State laws pertaining to the safety of College employees and to effect the elimination of unnecessary safety hazards from the workplace. This policy includes requirements under Federal OSHA regulations, regulations issued by Federal and State Agencies covering hazardous chemicals, asbestos, radioactive waste materials, and other substance potentially harmful to employees or to students.

The President is committed to take actions necessary to assure that the College is in compliance with this policy and with all pertinent Federal and State regulations.

The Chemical Hygiene Officer is authorized to review and recommend for approval substance handling and use plans developed by individual departments prior to their implementation to assure compliance with this policy.

INTRODUCTION

This booklet is intended to help you better understand the safety and health hazards of chemicals. Although the focus here is on chemicals you may be exposed to on the job, what you will learn also applies to chemicals you may encounter at home. Chemical hazard awareness is a key to minimizing accidental injury and ill health due to chemical use.

SAINT JOSEPH'S COLLEGE POLICY

SAINT JOSEPH'S COLLEGE CHEMICAL HAZARD COMMUNICATION PROGRAM

As users of hazardous chemicals, the College must fulfill certain obligations under State and Federal laws. These obligations include telling you:

1. The laws exist.
2. The campus is required to have a hazard communication program and what the components of that program are.
3. There is a written statement that outlines the campus Hazard Communication Program, including lists of hazardous chemicals you may come into contact with, and compilations of material safety data sheets on hazardous chemicals. (You will be informed where each of these is kept.)
4. About operations in your work area where hazardous chemicals are used. (You will be informed about these chemicals by your supervisor.)

The College has established a Chemical Hazard Communication Program in conformance with State and Federal laws to increase your awareness about the chemicals in your work area. The intent of this program is to make you an informed and active participant in your own safety. The program is called a communication program because its main feature is to alert you to and inform you about the chemicals with which you may come into contact.

There are four components of the College's program:

A. Chemical Hazard Training, which will enable you to understand and **respond to the** communications **on chemicals.**

B. Container Labels, which will serve as the means of communicating to you the common or chemical names of the hazardous chemicals contained with appropriate hazard warnings.

C. Material Safety Data Sheets, which are technical bulletins that serve as **a valuable** reference for information on hazardous chemicals.

D. Chemical Exposure Controls, which help prevent chemicals from being harmful.

SAINT JOSEPH'S COLLEGE POLICY

A. CHEMICAL HAZARD TRAINING

The College has an obligation to provide adequate training that will prepare you to work safely with hazardous chemicals.

As part of your training, you will need to be aware of certain basic properties of hazardous chemicals. These properties relate to the following aspects:

1. How Can the Substance Cause Harm?
2. How Much of It Is Needed for Harm to Occur?
3. What Kinds of Contact Are Important?
4. How Can I Tell if the Substance Is Present?

1. How Can the Substance Cause Harm?

A stick of dynamite or a cyanide pill are examples of hazardous chemicals. They are both substances capable of doing harm one by physical destruction, the other by poisoning. A chemical is hazardous when it has the potential to do physical harm or make one ill. These, then, are the two potential harm categories: physical hazards and health hazards.

Of course, when we speak of such a potential, we assume it is under normal conditions of use or in response to emergency conditions. Otherwise, all chemicals would have to be considered hazardous. Even the most harmless could pose a problem if used in an absurd way. For example, common table salt, which is normally considered harmless, could kill if too much is swallowed at one sitting. But that would not be an ordinary use of the material.

a. Physical Hazards

The following common categories of materials all present physical hazards. The specific properties of a substance which cause physical harm are well established. Refer to the glossary on pages 12-15 for more detailed definitions provided by OSHA. The specific properties include:

Combustible liquids - Liquids that can easily catch fire.

Compressed gasses - Gasses which are kept under high pressure inside **special containers.**

Explosives - Chemicals that can suddenly and violently react under the right conditions.

Flammables - Substances that can easily catch fire. Flammable liquids are substances, which can burn at lower temperatures than combustible liquids.

In addition, there are other less common categories of substances, such as organic peroxides, oxidizers, pyrophoric substances, and reactive or water-reactive materials that will be explained if they are present in your work setting. If you must deal with a substance that is labeled as being in one or more of these categories, you should handle it in special ways.

b. Health Hazards

Just as there are categories of substances posing physical harm, there are categories posing harm to our health. The health hazard categories are divided first by how fast the substance produces a noticeable effect on the body:

Acute effects are those which occur immediately, or very soon after exposure. According to OSHA, substances which cause acute effects include the following subcategories of materials:

- Irritants, like chlorine or formaldehyde, which cause reversible inflammation of the eyes, nose, throat, or skin;
- Corrosives, like caustic or acids, which cause visible destruction of living tissue;
- Sensitizing Agents, like poison ivy, which cause persons exposed to develop allergy-like responses upon repeat exposure, and toxins, like hydrogen sulfide or carbon monoxide, which are poisons. This category is further sub-divided into highly toxic and toxic groupings, based on chemical strength.

Chronic effects are those that take a longer time to develop. These substances can be categorized as:

- Carcinogens, like asbestos, which are proven or suspected cancer causing substances, and
- Long-term Toxins, like lead, which are substances which change bodily organs or systems upon repeated exposure.

2. How Much Of It Is Needed For Harm To Occur?

The capability of a substance for producing harm after being taken in by the body is a measure of its potency, or more technically, its toxicity. The smaller the amount needed to produce harm, the more toxic the substance is. Theoretically, any substance, even the most highly toxic, can be tolerated by the body at some low level without measurable effect. The job of the toxicologist is to define that "no-effect" level.

In order for a toxic substance to be absorbed though, it must first overcome the body's ability to shield itself, neutralize or otherwise prevent the chemical from affecting our bodies.

The two factors— toxicity and the bodily defenses – are key factors in establishing safe limits of exposure. One more factor plays a role, and that is whether the harmful effect is caused by hazardous material or by cumulative exposure to multiple doses.

In the first case, if the effect is produced by a single involvement, it makes the most sense to limit exposure so that it never exceeds the amount capable of producing the adverse effect. As simple as this concept is, bear in mind that it's not always easy to say just how much is the minimum that will produce the adverse effect. After all, it is impossible to test each person to see what the safe limit is, so toxicologists must rely on experiments with animals or experience with accidental exposures. Often, there is controversy in using such data to project safe limits.

Most of the effects caused by one-time high level involvement with a hazardous substance are acute effects (those that occur immediately).

Again - to prevent acute effects, "never-to-exceed" limits are the ones that apply. In practice, these take the names of short-term exposure limits (STELs), instantaneous values, or ceiling limits, depending on the authority establishing the limit.

If the effect is produced by multiple involvements over a long period, it makes the most sense to limit the average daily involvement to some low level amount.

Most of the effects resulting from long-term involvements are chronic effects (those that take time to develop). Again - to prevent chronic effects, the average amount of involvement is the critical factor; occasional high levels can be tolerated without producing the chronic effect, as long as the average is not exceeded. The averages are most often expressed as time-weighted-averages or TWA limits.

The previous paragraphs highlight some of the reasons why there are so many limits; there are those that apply to acute hazards, those that apply to chronic hazards, and both may be set by different agencies.

The Occupational Safety and Health Administration (OSHA) and the **American Conference of Governmental Industrial Hygienists (ACGIH)** are the two agencies involved in setting limits.

SAINT JOSEPH'S COLLEGE POLICY

051-IA, an agency of the Federal Government, establishes Permissible Exposure Limits (PEL) which are legally binding limits of exposure. If employee exposure exceeds the PEL, the College may be cited by OSHA for having caused the exposure depending on the circumstances involved. In a few cases, OSHA also publishes a limit called an Action Level. The Action Level is a limit of exposure which is lower than the PEL; and if the Action Level is exceeded, certain programs such as exposure monitoring, medical surveillance, or special training must be started to ensure the PEL is not exceeded.

The ACGIH is not a government agency, and therefore has only advisory power. In other words, its limits are not the law. However, since it updates its limits more often, the ACGIH guides are more current and better reflect scientific opinion on safe exposure limits. The ACGIH limits are called Threshold Limit Values (TLV).

Under the College Communication Program, training will be provided on the specific hazardous chemicals in employee work areas. Training will include information on chemicals that might be used where you work as well as those that are brought in from outside.

This training will prepare you to recognize the potential chemical hazards of materials you work with and what precautions are appropriate. But it is also important that you know what to do in non-routine situations, such as chemical spills or other foreseeable emergencies. You will also be trained for these events.

If you work near pipes or piping systems containing hazardous materials, you will also be trained on the special hazards associated with them.

Finally, if there are chemical exposure control systems in your work area, you will be told about them, so that you can tell if they are functioning properly and how to work with them.

3. What Kinds of Contact Are Important?

A hazardous chemical must come into contact with you for it to harm your health. But the forms of possible contact are significant, particularly with regard to the kind of precautions that are appropriate. The different forms of contact are called routes of entry, and they include the following:

--Direct Contact (to the skin or eyes) is the most important form of contact for corrosive substances. One attempts to avoid direct contact with such materials by using closed process systems. But some potential for exposure (accidental or as a part of specific processes such as solvent cleaning) may still exist. For this reason, use protective clothing such as gloves, goggles, aprons or other gear as a supplement, to minimize possible contact.

--Inhalation is the breathing of the substance. Once a hazardous smoke, dust, vapor, mist or gas is inhaled, it may damage the nose, throat and lungs, or pass into the blood system and damage other parts of the body. Strive to minimize the generation of such substances, and to prevent dangerous concentrations of them from building up in work areas. As a backup, and to help in situations where dangerous concentrations could be present, respiratory protection equipment is to be used.

--Skin Absorption occurs when chemicals can pass through the skin and get into our blood system. Some 25% of the chemicals regulated by OSHA possess the capability to be taken up by the body through skin absorption.

Ingestion involves accidental swallowing of even small quantities of substances. Some of these substances are very toxic and can cause harm. Hence, a strong case can be made to be sure hands are clean before eating (or smoking), and after having worked with a hazardous chemical (particularly if the hazardous substance is not readily visible).

4. How Can I Tell if the Substance Is Present?

The less detectable a hazardous substance, the more dangerous it is, other things being equal. Hazardous substances may be invisible, odorless and tasteless. That's why we must rely on various electronic monitors to alert us to their presence in situations where the substances might be present.

Many other substances have characteristic properties we can use, without electronic monitors, to determine their presence. Some have particular smells, like alcohol vapors or hydrogen sulfide (in low concentrations). Others have a characteristic appearance, like the green color of chlorine.

You will be trained on the characteristic properties of chemicals you deal with, so that you can detect a release of the substance or its presence.

SAINT JOSEPH'S COLLEGE POLICY

B. Container Labels

Any hazardous chemicals received from suppliers will be in containers that are labeled with key items of information that include:

- The identity of the hazardous chemical in the container.
- Appropriate hazard warnings (symbolic or written).
- The name and address of a party responsible for information about the product.

These labels will serve as the first means of conveying that a hazardous substance is present and that special precautions are in order. You will find additional information on the substance in the material safety data sheet for the substance named on the label, as explained in Section C of this booklet.

Appropriate warnings indicative of the presence of hazardous chemicals will also be used for in-house containers (vessels, tanks, and barrels). However, the form of the warning may vary slightly from work area to work area. Any differences will be explained to you.

Never remove or deface any container label. Pipes and piping systems are handled separately from containers.

C. Material Safety Data Sheets (MSDS)

In addition to labels, suppliers will provide technical bulletins on hazardous chemicals. These technical bulletins are called material safety data sheets or MSDS's for short. Each MSDS contains a wealth of detailed information, as described below.

The MSDS's appropriate to chemicals in your work area will be kept in an accessible location, available for your use when needed. Feel free to refer to them, whenever you have a question about the chemicals in your work area.

Although the exact form of each MSDS may vary, all must contain a certain minimum of information. The following is a description of the types of information you will find, and how each section may apply to you:

Section I - Material Identification

This section contains the common and technical names for the material as well as its chemical formula and other designations. The manufacturer's name and address is provided here, as well as one or more emergency telephone numbers to use in case additional information is needed.

SAINT JOSEPH'S COLLEGE POLICY

Use this section to be sure you're looking at data for the right material and to find a source for supplemental help for situations not covered in the rest of the MSDS.

Section II – Material Identification

This section lists some or all of the ingredients of the material, including at least those deemed hazardous. Safe exposure limits to named ingredients will be included in this section.

Section III – Physical / Chemical Characteristics

This section provides information on the physical properties of the substance, such as its characteristic appearance and odor. The information here will help to identify the presence of the substance by sight or odor.

If the material is a gas, the vapor density is of interest. If the vapor density exceeds 1, the substance will sink in air, and therefore tend to accumulate in low lying areas or basements. Other technical data included in this section might be useful to personnel responsible for fire fighting, engineering, or spill clean-up.

Section IV - Fire and Explosive Hazard Data

This section describes conditions under which the material will burn or explode and how to put out fires involving the substance.

You should review this section to understand the safe limits of use with regard to fires or explosions, and special needs for fighting fires involving the material.

Section V - Reactivity Data

This information describes the stability of the material and certain categories of materials with which it can react unfavorably.

This section would be useful to evaluate the safety of any new procedures that may place the chemical near or cause the chemical to mix with other materials.

Section VI - Health Hazard Information

This section explains the health effects of the substance by route of entry and will provide first aid information.

Use the material presented here to identify safe limits of exposure, to understand the effects of overexposure, and to understand how this material can cause harm to health. Use it also to identify first aid procedures, in the event of an accidental overexposure.

SAINT JOSEPH'S COLLEGE POLICY

Section VII —Precaution for Safe Handling and Use.

This section describes methods for proper handling of spills, leaks and disposal. It also provides information of significant environmental hazards.

This section should be consulted in the event of an environmental mishap, as a supplement to normal procedures followed for environmental reasons.

Section VIII -Control Measures

This section describes personal protective equipment required, and possible conditions under which it must be used.

Refer to this general manufacturer recommendations on protective gear. The chemical manufacturer may recommend personal protection equipment for a worst-case condition, which may not be a condition that applies to your situation.

Section IX --Special Precautions and Comments

This section describes any other information that should be followed for safe handling or storage.

D. Chemical Exposure Control

There are many ways the College may use to minimize worker exposure to chemicals. These include:

- **Engineered controls** include applying ventilation techniques to remove contaminated air or supply fresh air, storage areas or cabinets to prevent release of a hazardous material, incorporation of new technology to substitute for processes or ingredients considered hazardous and design of facilities with state-of-the-art means of minimizing exposure.
- **Administrative controls** are mainly procedures adopted to prevent accidents; these include buddy systems, use of personal monitors, and vessel entry procedures.
- **Personal protective equipment** includes use of dust masks and other kinds of respirators, goggles, face shields, aprons, gloves, impervious boots and other forms of safety clothing, all designed to restrict the normal route of entry for the hazardous material being used. Personal protective equipment is used as an extra precaution whenever called for or as a last resort when other means are unavailable.

SAINT JOSEPH'S COLLEGE POLICY

CONCLUSION

Chemical safety is a team effort. Administrators, department heads, directors, supervisory staff, operational employees and others, all get involved in preventing chemical accidents. But the key person is really you .
the one who works with chemicals on a daily basis. Personal protective equipment only works if it's worn properly. Engineered systems provide designed protection only if operated as intended. And beyond that, the best safeguard is an informed employee.

Take the training you are provided to heart. The College wants you to be an informed and active participant in your own safety.

GLOSSARY OF TERMS

ACGIH - American Conference of Governmental Industrial Hygienists; an organization of health and safety professionals from governmental agencies or educational institutions. ACGIH develops recommended occupational exposure limits for chemical substances and physical agents (see Threshold Limit Value).

Acute Effect - An adverse effect on the body quickly following a one-time or brief exposure to a high level of a material.

American Conference of Governmental Industrial Hygienists - See ACGIH.

Asphyxiant - A vapor gas which can cause unconsciousness or death by suffocation from lack of oxygen. Asphyxiation is one of the principal potential hazards of working in confined and enclosed spaces.

Boiling Point - The temperature at which a liquid boils or changes to a vapor. Flammable materials with low boiling points present special fire hazards.

C Limit - See ceiling limit.

Carcinogen - A substance or material that is capable of causing cancer.

Caustic - A corrosive chemical with a high pH (alkaline or basic).

Ceiling Limit - The maximum concentration of a chemical, dust, or physical agent that is allowed at any one time (see also PEL and TLV).

Chemical Hazard - A substance with the potential to do harm.

Health Hazard - Substances that can adversely affect our health.

Chronic Effect - An adverse effect on the body which develops slowly over a long period of time. The result of a long-term or frequent exposure to hazardous concentrations of a material. Chronic effects or diseases may not show up for many years after exposure.
Combustible Liquids - Any liquid that has a flash point (becomes flammable) above 100 degrees but less than 200 degrees F.

Compressed Gasses - Gasses that have absolute pressures exceeding lO4psi at 70 degrees F, or an absolute pressure exceeding lO4psi at 130 degrees F, regardless of the pressure at 70 degrees F, or a liquid having a vapor pressure exceeding 4opsi at 100 degrees F.

Concentration - The relative amount of chemical, dust or other substance in a given amount of air. The unit for measuring concentration of dust or mist in the air is using mg/M3 (milligrams of the substance per one cubic meter of air). The units for measuring concentration of gasses and vapors is usually ppm or parts of a material per million parts of air.

Corrosive - A substance that can cause visible destruction or eat away another substance. Corrosive chemicals, such as strong acids, alkalis, and caustics can cause burns and irritation at the site of contact with the human skin.

Dermatitis - Inflammation of the skin such as redness, rash, dry or cracking skin, blisters, swelling, or pain. May result from skin exposure to toxic or abrasive materials.

Dose - The rate at which a substance is administered (amount divided by time).

Explosive - A chemical that can suddenly and violently react under the right conditions.

Flammable Limits - (Explosive Limits)

Lower Flammable - (Explosive) Limit - The lowest concentration of a combustible or flammable gas or vapor in air that will produce a flash of fire. Mixtures below this concentration are too lean to burn.

Upper Flammable - (Explosive) Limit - The highest concentration of a combustible or flammable gas or vapor in air that will produce a flash of fire. Mixtures above this concentration are too rich to burn.

Flammable Liquids - Burn at lower temperatures than combustible liquids and have flash points below 100 degrees F.

Flash Point - The temperature at which a liquid will give off enough flammable vapor to sustain combustion.

Industrial Hygiene - The technical specialty concerned with the recognition, evaluation, and elimination of workplace health hazards.

SAINT JOSEPH'S COLLEGE POLICY

Ingestion - Eating or taking in a substance by mouth.

Inhalation - The breathing of something into the lungs.

Irritant - A substance which will cause an inflammation or reaction of the eyes, skin or respiratory system. The effect of an irritant is reversible after exposure is ended.

Lethal Dose - The concentration of a substance being tested that will kill a test animal.

MSDS - Material Safety Data Sheet, or technical bulletin covering a chemical.

Oral Toxicity - Adverse effects resulting from taking a substance into the body through the mouth. Usually used to denote effects in experimental animals.

OSHA - Occupational Safety and Health Administration, a federal regulatory agency established by the Department of Labor.

Oxidizing Agent - A chemical or substance which gives off oxygen in a chemical reaction and stimulates the combustion of organic materials.

PEL or Permissible Exposure Limit - Maximum safe exposure limits established by OSHA.

Physical Hazard - See Health Hazard.

Polymerization - A chemical reaction in which two or more small molecules combine to form larger molecules. A hazardous polymerization is a reaction that takes place so fast that large amounts of energy are released.

Reactivity - The tendency of a material to undergo a chemical reaction with the release of energy or the formation of noxious, toxic, or corrosive by-products.

Reducing Agent - A chemical which combines with oxygen in a chemical reaction.

Route of Entry - The means by which a chemical can be taken into the body.

Sensitizer - A substance which on first exposure causes little or no reaction in man or test animals, but which on repeated exposure may cause a noticeable response such as a skin reaction or respiratory distress.

Solubility - A measure of the amount of a substance that will dissolve in a given amount of water or another solvent.

Solvent - A liquid capable of dissolving another substance.

Spontaneous Heating - An increase in the internal temperature of a substance due to a chemical or physical change without the application of external heat.

Stability - A measure of the tendency of a substance to be handled and stored without undergoing unwanted chemical changes.

STEL - Short Term Exposure Limit, a form of averaging an involvement with a chemical over a brief period of time, normally taken as 15 minutes.

Tetratogen - An environmental agent that interferes with the normal development of a fetus.

Thermal Decomposition- - The chemical breakdown of a material brought about by exposure to heat.

Toxicity - The degree of injury, illness, or adverse effects resulting from exposure to hazardous materials.

A **highly toxic** substance has an LD of 50 milligrams or less per kilogram of rat body weight, administered orally.

A **toxic** substance has an LD between 50 and 500 milligrams per kilogram of rat body weight, administered orally.

TWA - Time Weighted Average, a way of arriving at a simple number to represent an exposure to a time varying involvement with a chemical.

ACKNOWLEDGEMENTS

Saint Joseph's College wishes to acknowledge the preliminary work done by the following, without which our task would have been more difficult.

- University of Maine Systems & Campuses
- Bureau of Labor Standards
- Morse, Payson & Noyes
- Saint Joseph's College Communications Office