



Best Practices Guide For Hazard Communication Program Development

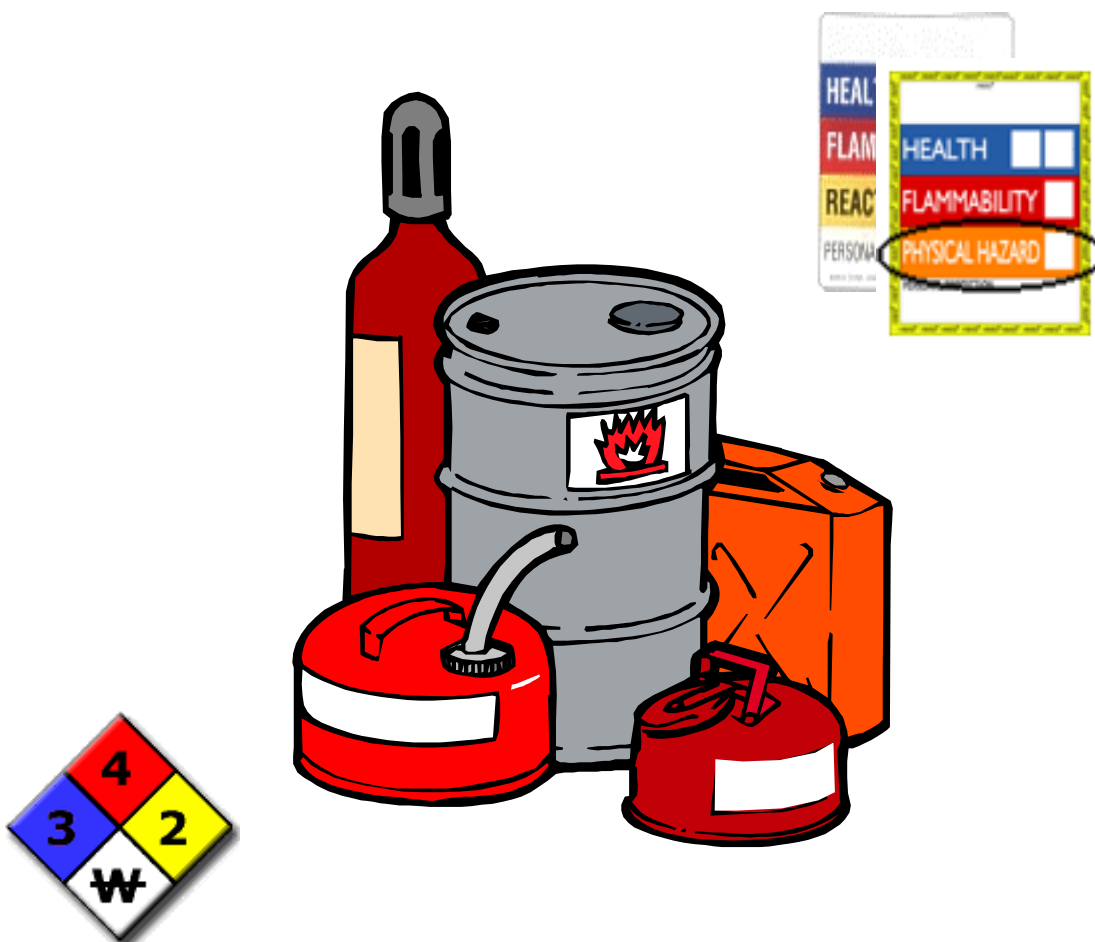


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HAZARD COMMUNICATION PROGRAM DEVELOPMENT

Introduction

Hazardous materials are part of our everyday workplace/environment. Used correctly, chemicals are an important part of the work we do. However, often we do not give these chemicals a second thought until there is an accident. Some materials, although important tools, can also be flammable, reactive, corrosive, or toxic. When employees know what materials are being used, how to use them safely, and what to do in the event of an emergency, the workplace can be kept much safer. The key is to have a system in place that tells everyone what they need to know to avoid accidents. Clear and well-planned communication is very important.

Scope

This information was prepared to assist you in developing your Hazard Communication Program. As is the case with all safety plans, to be effective they must relate to YOUR operations and employee exposures. There are several laws, standards, rules and regulations that pertain to this topic. Hazardous materials include those that are flammable, corrosive, reactive, toxic or explosive and may present physical and/or health hazards. You must consider all possible routes of entry into the body, which include inhalation, ingestion, absorption, and injection. You should also consider the hazards associated with any mixtures in the workplace. The Hazard Communication Program should not be confused with a Chemical Hygiene Plan, which is associated with chemical labs, or with HazMat which deals with hazardous materials, as they are different and distinct programs.

Examples of Hazardous Chemicals by Department

Hazardous chemicals or materials containing hazardous chemicals are found in most municipal departments and quasi-municipal entities. Because chemicals are so common in the workplace, some departments may think they have no exposure and do not fall within the requirements of the standard. Listed below are some examples by department of materials that will meet the “hazardous” definition.

Administrative - Printer cartridges and toner, cleaning/disinfecting custodial supplies, and fire extinguishing agents.

Public Works - Lubricants and solvents, grinding wheels, welding rods, oxygen/acetylene gas, paints, and pressure treated wood.

Police - Firearms cleaning solvents and lubricants, pepper spray, lab chemicals, and cleaning/custodial supplies.

Fire - Fuels, chemical foam, hydraulic fluid, and custodial supplies.

EMT - Disinfecting products, lubricants, oxygen and compressed gases.

Schools - Materials used in technical/vocational training areas; art supplies such as glues, solvents, bonding agents, and cleaning supplies.

Wastewater Treatment - Process chemicals such as lime, polymers, chlorine, etc.

Parks & Recreation – Fuels, fertilizers, weed killers, lime, and pool supplies.

Requirements

OSHA Standard 29 CFR 1910.1200, which has been adopted by Maine Department of Labor and is applicable to municipalities, requires the development of a written **HAZARD COMMUNICATION** program, which must include the following elements:

- A list of all hazardous materials used in the workplace reviewed annually and updated as new materials enter the workplace
- The procedures used to collect and maintain MSDSs
- A description of labeling system used
- The procedures used to ensure that all containers and process piping are properly labeled
- The contents of the program and methods of training and providing hazardous material information to employees
- Procedures for safely conducting non-standard work practices
- Procedures for ensuring contractors and other non-employees are informed of the hazardous materials in the workplace.

Steps to Develop Your Program

1. **Responsibility.** Designate a Hazard Communication Program coordinator. This responsible party ensures that the program is being implemented, maintained and updated as necessary. The coordinator also ensures that training is provided to employees. The program can be coordinated by an individual or a safety subcommittee. Document what is done and by whom.
2. **Inventory Your Hazardous Materials.** Identify the hazardous materials used in your workplace. Product labels and MSDSs are an important source of this information. One way to do this is to complete a hazardous materials inventory, which lists all chemicals and products used in all areas of the workplace. Include all departments. Implement a procedure for adding new purchases. See Attachment C.
3. **Labeling.** One of the best ways to control hazardous materials in the workplace is to make sure that all containers are properly labeled. In addition, labeling of all primary and secondary containers is required by OSHA. Proper labeling includes:
 - Name of chemical
 - Name of manufacturer or distributor
 - Appropriate hazard warnings (health, fire, reactivity and special hazards)
 - Part of the body or organs affected
 - Proper handling procedures
 - HMIS Labeling System - See Attachment D

The NFPA 704 Hazard Identification Rating System is designed to provide information to first responders and should not be considered your primary means of labeling. See Attachment E.

4. **Collect, Analyze, File and Make Available Material Safety Data Sheets (MSDSs)**. MSDSs must be supplied by manufacturers and distributors for all hazardous materials. They are an important part of your program. As each MSDS comes into the workplace, check to see that all required information is present. Review all sections and make sure you are conducting your operations in the proper manner. Obtain MSDS before the material is received at your workplace. This allows time for the MSDS to be reviewed, employees to be informed of hazards, and to ensure that you are capable of properly handling and storing the material. All MSDS should be maintained in a master binder at a central location. Individual site locations should maintain a binder containing all MSDS used at that location. See attachment B for a sample MSDS.
5. **Develop a Written Hazard Communication Policy**. The most important part of any hazard communication effort is the development of a written policy. It helps to ensure that employees know the hazards of the materials used, how to avoid health and physical hazards, and the procedures followed in collecting and distributing hazardous material information. See Attachment A.
6. **Provide Training**. The best way to make sure that all employees understand your Hazard Communication Program is by conducting training. The training should inform employees about the OSHA standard, the type and location of hazardous materials in the workplace, health and physical hazards, and all safety and emergency procedures associated with their use and storage. Training should occur at the time of hire for new employees, when a new material is introduced into the workplace, when process changes create a new hazard, or when the employer has a reason to believe that employees do not understand the program.

Training Should Cover the Following Points:

- Requirements of the OSHA standard
- Information on any operation in the area where hazardous materials are present
- Procedures for detecting and identifying hazardous materials
- Safe handling procedures
- Storage procedures
- Emergency procedures
- The use of labels and MSDSs
- Employee access to MSDS files
- How to interpret MSDS information
- Your written hazard communication policy
- Non-routine tasks
- Communication with contractors

7. **Communicate to Management**. A successful program means that all levels of management are involved. Make sure that all levels within your organization follow the policy, know where information is located, and are well informed.
8. **Evaluate, Update, and Maintain Your Program**. To make sure your program will provide employee protection, it is important to regularly evaluate and update it. Monitor all chemicals coming into the workplace and be sensitive to any changes in materials and or suppliers. See Attachment G.

Make sure you update and maintain the following:

- MSDS files
- Labeling
- Written Policy
- Training

9. **Maintain MSDS for Discontinued Materials**

You need to maintain MSDS records for materials that are no longer used by your organization for a period of thirty years. These can be kept in your master MSDS binder under “Discontinued MSDS” or may be filed in another location. The written policy should indicate where MSDS, both current and discontinued are located.

Sources of Additional Help

MMA, Risk Management Services. Please call Loss Control Services @ (800) 590-5583 or visit our website @ <http://www.memun.org/rms/LC/default.htm>.

OSHA Standard: 29 CFR 1910.1200, 29 CFR 1926.59. <http://www.osha.gov/>

MMA On-Line Training <http://www.firstnetlearning.com/offerings/mma/>

Maine Department of Labor, Safety Works. <http://www.safetyworksmaine.com>

NIOSH Pocket Guide. <http://www.cdc.gov/niosh/homepage.html>

<http://www.cdc.gov/niosh/npg/npgdname.html>

International Chemical Safety Cards (ICSCs) @ <http://www.cdc.gov/niosh/ipcs/nicstart.html>

National Fire Protection Association @ <http://www.nfpa.org>

The MSDS Hyper Glossary @ <http://www.ilpi.com/msds/ref/stel.html>

ATTACHMENT A (Sheet 1 of 4)

Sample Written Hazard Communication Program

1. Organization Policy

To ensure that information about the dangers of all hazardous chemicals used by (**Name of Entity/Member**) is known by all affected employees, the following Hazard Communication program has been established. It is our intention to provide a hazardous chemical list, use Material Safety Data Sheets (MSDS), ensure that containers are labeled, and provide employee training to ensure compliance with 29 CFR 1910.1200.

The Program Coordinator, _____, is acting as a representative of the City/Town Manager, who has overall responsibility for the program.

All departments of (**Organization Name**) will participate in the hazard communication program. This written program will be available in the (**Location(s)**) for review by any interested employee.

2. Container Labeling

The program coordinator will verify that all containers received for use will be clearly labeled as to the contents, note the appropriate hazard warning, and list the name and address of the manufacturer.

The supervisor in each area will ensure that all primary containers are labeled and that secondary containers are labeled with either an extra copy of the original manufacturer's label or with labels that have the identity and the appropriate hazard warning.

3. Material Safety Data Sheets (MSDSs)

The program coordinator is responsible for establishing and monitoring the organization's MSDS program. The program coordinator will make sure procedures are developed to obtain the necessary MSDSs and will review incoming MSDSs for new or significant health and safety information. The program coordinator will see that any new information is passed on to affected employees. The procedure below will be followed when an MSDS is not received at the time of initial shipment:

(Enter procedure to be followed here.)

Copies of MSDSs for all hazardous chemicals to which employees are exposed or are potentially exposed will be kept in (**state location(s)**).

MSDSs will be readily available to employees in each departments work area(s) for products used in that department.

Note: If an alternative to paper copies of material safety data sheets is used, then describe the format used and how to access them.

(Describe format here.)

ATTACHMENT A (Sheet 2 of 4)

Sample Written Hazard Communication Program

MSDSs will be readily available to all employees during each work shift. If an MSDS is not available, contact the area supervisor or the program coordinator.

When revised MSDSs are received, the following procedures will be followed to replace old MSDSs:

(Describe procedures.)

4. Employee Training and Information

The program coordinator is responsible for the Hazard Communication Program. He/she will ensure that all program elements specified below are carried out.

Prior to starting work, each new employee will attend a health and safety orientation that includes the following information and training:

- An overview of the requirements contained in the Hazard Communication Standard
- The hazardous chemicals present at his/her work area
- The physical and health risks of the hazardous chemicals
- Symptoms of overexposure
- How to determine the presence or release of hazardous chemicals in the work area
- How to reduce or prevent exposure to hazardous chemicals through use of control procedures, work practices, and personal protective equipment
- Steps the **(Organization Name)** has taken to reduce or prevent exposure to hazardous chemicals
- Procedures to follow if employees are overexposed to hazardous chemicals
- How to read labels and MSDSs to obtain hazard information
- Location of the MSDS file and written hazard communication program. [If you are using an electronic access method such as a database or on-line service, you will need to ensure that your employees know how to utilize the system to retrieve MSDSs.]
- Prior to introducing a new chemical hazard into any department, each employee in that department will be given information and training as outlined above for the new chemical hazard. The training format will be as follows:

(Enter format, such as audiovisuals, interactive computer programs, classroom instruction, etc.)

Sample Written Hazard Communication Program

5. Hazardous Non-Routine Tasks

Periodically, employees are required to perform non-routine tasks that are hazardous. Some examples of non-routine municipal tasks are: confined space entry, tank cleaning, and stripping/finishing floors.

Prior to starting work on such projects, each affected employee will be given information by the program coordinator about the hazardous chemicals he or she may encounter during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use, and steps (**Organization Name**) is taking to reduce the hazards, including ventilation, respirators, the presence of another employee (buddy systems), and emergency procedures.

6. Informing Contractor and Other Employers

It is the responsibility of the program coordinator to provide other employers with information about hazardous chemicals their employees may be exposed to on a job site and suggested precautions for employees. It is the responsibility of the program coordinator to obtain information about hazardous chemicals used by other employers to which employees of this organization may be exposed.

Other employers will be provided with material safety data sheets for hazardous chemicals generated by (**name of this organization**).

Material Safety Data Sheets (MSDSs) will be provided to other employers in the following manner:

(Provide policy here)

In addition to providing a copy of an MSDS to other employers, other employers will be informed of precautionary measures needed to be taken to protect their employees who are exposed to operations performed by (**name of this entity**).

Also, other employers will be informed of the hazard labels used by the company. If symbolic or numerical labeling systems are used, the other employees will be provided with information to understand the labels used for hazardous chemicals for which their employees may have exposure.

ATTACHMENT A (Sheet 4 of 4)

Sample Written Hazard Communication Program

7. List of Hazardous Chemicals

Attached is a list of all known hazardous chemicals used by our employees. This list includes the name of the chemical, the supplier or manufacturer, and the department the chemicals are used in. Further information on each chemical may be obtained from the MSDSs, which are located **(state location.)**

When new chemicals are received, this list will be updated within 30 days of introduction of the new chemical into the workplace. To ensure that the chemical is added in a timely manner, the following procedures shall be followed:

(State procedures to be followed.)

The hazardous chemical inventory was compiled and is maintained by:

(Program Coordinator)

8. Chemicals in Unlabeled Pipes

Work activities are sometimes performed by employees in areas where chemicals are transferred through unlabeled pipes. Prior to starting work in these areas, the employee shall contact **(Area Supervisor/Program Coordinator)** for information regarding:

- The chemical in the pipes
- Potential hazards
- Safety precautions to be taken

Note: Include here the chemical list developed during inventory. Arrange this list so that you are able to cross-reference it with your MSDS file and labels on your containers. Additional information such as the manufacturer's telephone number, an emergency number, scientific name, CAS number, the associated task etc., could be included and might be found useful to employees and the employer.

9. Program Availability

A copy of this program will be made available, upon request, to employees and their representatives by contacting _____,
Program Coordinator

ATTACHMENT B (Sheet 1 of 9)

Sample MSDS With Section Explanations

Material Safety Data Sheets need to contain at a minimum the following information:

- Manufacturer/Supplier - name, address, and phone number
- The chemical name or common name of the product
- Physical and Chemical Characteristics - vapor pressure/flash point
- Physical Hazards - potential for fire, explosion, reactivity
- Health Hazards - symptoms of exposure, routes of entry, exposure limits listed in the National Toxicology Program
- Safe Handling Information - hygienic practices, protective measures, clean-up procedures
- General Control Measures - engineering controls, work practices, and PPE
- Emergency first aid procedures
- Date of preparation of the MSDS or date of last change

Sample MSDS With Section Explanations

Section 1. Product and Company Identification

MSDS contents (sample)	Explanation
Product name Acme Termiticide Concentrate	Product's brand name.
Manufacturer Acme Agrosiences P.O. Box 12345 9330 Chemical Way Indianapolis, IN	Company's identification and where to obtain information.
Telephone number for information (800) 123-4567	Non-emergency information regarding the product.
CHEMTREC (800) 424-9300	Chemical Transportation Emergency Center phone number for transportation emergencies.
EPA registration number 264-945	EPA assigns each registered product its own identity number.
Date prepared October 15, 1999	Date on which the MSDS was prepared.
Code number 000897	Identification number assigned by the manufacturer.
Chemical family Pyrethroid pesticide	One of the classifications of pesticides.
MSDS number S000-10000	Specific product identification assigned by the manufacturer.

Section 2. Composition/Information of Ingredients

MSDS contents (sample)	Explanation
Chemical ingredients Active ingredient propachlor, 2,3-diethyl — 20 percent Inert ingredient attapulgate — 80 percent	The active ingredient controls the pest. Inert ingredients can help make the product safer and easier to handle. Both the active and inert ingredients must be listed if they are known to contribute to the product's hazard potential unless they are a trade secret.
CAS Reg. No propachlor 1919-16-7 attapulgate 8031-13-3	Active and inert ingredients are also identified by their Chemical Abstract Service (CAS) number.

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Sample MSDS With Section Explanations

Section 3. Hazard Identification

MSDS contents (sample)	Explanation
Emergency overview brown liquid, aromatic odor. Causes substantial but temporary eye injury. Harmful if absorbed through skin.	This information is intended for emergency response personnel.
Potential health effects Acute eye: causes redness, irritation, tearing. Acute skin: nonirritating. Acute inhalation: may cause respiratory tract irritation. Acute ingestion: may cause loss of coordination, burns to mouth and esophagus.	Acute effects occur immediately upon exposure to the substance through the eyes or skin or by inhalation or ingestion.
Chronic effects This product contains ingredients that are considered to be probable or suspected human carcinogens (see Section 11 — Chronic).	Chronic effects are those due to long-term exposure to the substance.

Section 4. First Aid Measures

MSDS contents (sample)	Explanation
Eyes Hold eyelids open and flush with a steady, gentle stream of water for at least 15 minutes. Seek immediate medical attention, preferably with an ophthalmologist.	What to do if the product gets into the eyes.
Skin exposure In case of contact, wash with plenty of soap and water. Seek medical attention if irritation develops or persists.	What to do if the product gets on the skin.
Inhalation Remove the victim from immediate source of exposure and assure that the victim is breathing. If breathing is difficult, administer oxygen, if available. If victim is not breathing, administer CPR (cardiopulmonary resuscitation). Seek medical attention.	What to do if the product is breathed into the lungs.
Ingestion If victim is conscious and alert, give 2 to 3 glasses of water to drink and do not induce vomiting. Seek immediate medical attention.	What to do if the product is swallowed.
Notes to physician All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred. Treat symptomatically. No specific antidote available. This material is an acid. The primary toxicity of this product is due to its irritant effects on mucous membranes.	Specific instructions to the physician. Users should be familiar with where this is found on the MSDS so that in an emergency, the information can be given to the physician quickly. Any treatment listed in this section should not be attempted by a nonmedical person.

ATTACHMENT B (Sheet 4 of 9)

Sample MSDS With Section Explanations

Section 5. Firefighting Measures

MSDS contents (sample)	Explanation
Flash point 63°C/145°F	The minimum temperature at which a liquid gives off vapor in sufficient concentration to ignite near the surface of the liquid or in the test vessel used.
Lower explosive limit 2.6 percent Upper explosive limit 12.6 percent	The upper and lower explosive limits are concentrations in air that will produce a flash of fire when an ignition source is present.
Extinguishing media Recommended: foam, water, carbon dioxide, dry chemical.	Specific instructions to firefighters on how to extinguish a fire involving the chemical.
Personal protective equipment Wear self-contained breathing apparatus (pressure-demand MSHA/NIOSH approved or equivalent) and full protective gear.	Description of safety equipment that firefighters should use in case of fire involving the chemical.
Special procedures Contain runoff. Remain upwind. Avoid breathing smoke. Use water spray to cool containers exposed to fire.	Safety instructions to emergency personnel responding to the fire.
Unusual fire and explosion hazards Product will burn under fire conditions.	Additional safety information for emergency personnel.
Hazardous decomposition materials (under fire conditions) hydrogen chloride, oxides of carbon.	By-products formed due to fire that may pose a risk to emergency personnel and the environment.

Section 6. Accidental Release Measures

MSDS contents (sample)	Explanation
Evacuation procedures and safety Wear appropriate protective gear for the situation. See personal protection information in Section 8.	Actions to take when dealing with a spill.
Containment of spill Stop leak if it can be done without risk. Dike spill using absorbent or impervious materials such as earth, sand or clay.	
Cleanup and disposal of spill Absorb with vermiculite or other inert absorbent. Shovel up into an appropriate closed container (see Section 7: Handling and Storage). Decontaminate tools and equipment following cleanup.	
Environmental and regulatory reporting If spilled on the ground, the affected area should be removed to a depth of 1 to 2 inches and placed in an appropriate container for disposal. Prevent material from entering public sewer system or any waterways. Spills may be reported to the National Response Center (800-424-8802) and to state and/or local agencies.	

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Sample MSDS With Section Explanations

Section 7. Handling and Storage

MSDS contents (sample)	Explanation
Minimum/maximum storage temperatures 0 to 50°C (32 to 122°F)	Temperature range for storing the product in order to prevent chemical separation, inactivation, crystallization, coagulation or other breakdown.
Handling Do not breathe vapors and mists. Do not get on skin or in eyes. Do not ingest. Use handling, storage and disposal procedures that will prevent contamination of water, food or feed. Avoid freezing. If freezing occurs, thaw and remix before using.	Procedures to minimize the risks of accidental exposure or release of the product.
Storage Store in an area that is away from ignition sources.	Procedures that minimize potential storage hazards.

Section 8. Exposure Controls / Personal Protection

MSDS contents (sample)	Explanation
Ingestion Prevent eating, drinking, tobacco usage and cosmetic application in areas where there is a potential for exposure to the material. Always wash thoroughly after handling.	Protective measures to reduce the likelihood of swallowing.
Eye contact To avoid eye contact, wear safety glasses with side shields or chemical goggles.	Protective measures to reduce the likelihood of the pesticide getting in the eyes.
Skin contact To avoid skin contact, wear rubber gloves, rubber boots, long-sleeved shirt, long pants and a head covering.	Protective measures to reduce the possibility of getting the pesticide on the skin.
Respiratory protection To avoid breathing dust, use a particulate filter, NIOSH-approved per 42 CFR Part 84. Select N or R or P type as appropriate for the oil characteristics of any other air contaminants present. Filter efficiency may range from 95 percent to 99.7 percent as appropriate for the size distribution of dusts present.	The type of respirator, if any, needed when handling this product.
Engineering controls If needed, use local exhaust to keep exposures to a minimum.	Procedures used to maintain airborne levels below TLV (Threshold Limit Value) or PEL (Permissible Exposure Limit).
Exposure guidelines Benomyl: PEL (OSHA): 15 mg/m ³ , total dust, 8 hr. TLV (ACGIH): 0.84 ppm, 10 mg/m ³ , 8 hr.	PEL and TLV identify the concentration of chemical in the air, below which workers would not be expected to experience health problems during a 40-hour workweek.

ATTACHMENT B (Sheet 6 of 9)

Sample MSDS With Section Explanations

Section 9. Physical and Chemical Properties

MSDS contents (sample)	Explanation
Color Yellow liquid.	Describes the physical appearance of the chemical.
Odor characteristic Kerosene odor.	Describes the product odor for detection purposes.
PH 4.1 Aqueous solution.	PH values from 0 to 2 and from 12 to 14 are usually corrosive to skin and eyes. Also may be helpful in neutralizing a chemical spill.
Specific gravity (Water = 1) 0.95	The weight of the chemical compared to the weight of an equal volume of water.
Vapor density (Air = 1) 4.8	Weight of the chemical's vapor compared to air. Vapors with weight values less than 1, rise. Those with weight values greater than 1, sink and concentrate.
Vapor pressure 3 mm Hg @ 25°C/77°F	Measurement of the potential of the chemical to convert to a gaseous form.
Boiling point 176°C (349°F)	Temperature at which a liquid becomes a vapor.
Solubility in water 0.1 ppm	A measurement of the amount of material that will dissolve in water. Materials with a value of 100 ppm and less are considered to be relatively insoluble, while those with values greater than 1,000 ppm are considered very soluble.

Section 10. Stability and Reactivity

MSDS contents (sample)	Explanation
Chemical stability Stable at normal temperatures and storage conditions.	Usually general terms to describe the chemical's stability. At times, temperatures will be listed at which the chemical becomes unstable.
Hazardous polymerization Will not occur.	This is a statement that states if the product will react dangerously with itself to form other products.
Conditions to avoid Avoid freezing temperatures.	Describes conditions under which the product may damage the product, the container or cause a hazardous condition.
Chemical incompatibility Oxidizing agents.	Describes other materials, which may react with the product.
Hazardous decomposition products HCl, HF, NO ₃ during combustion.	A list of by-products that are formed when the product burns or is subjected to other conditions.

ATTACHMENT B (Sheet 7 of 9)

Sample MSDS With Section Explanations

Section 11. Toxicological Information

MSDS contents (sample)	Explanation
Acute Data	
Eye irritation Rabbit: substantial irritation.	Consequences of short-term exposure to eyes.
Skin irritation Rabbit: severe irritation	Consequences of short-term exposure to skin.
Oral LD₅₀ Rat: 3600 mg/kg	Toxicity of short-term exposure from ingestion. The LD ₅₀ is the dose level that is expected to cause the death of 50 percent of the test animals.
Dermal LD₅₀ Rabbit: >5000 mg/kg	Toxicity by absorption through the skin.
Inhalation LC₅₀ Rabbit: 11 mg/L for 4 hr	Toxicity from breathing dusts, fumes or vapors. The LC ₅₀ is the concentration of dust, fume or mist that is expected to kill 50 percent of the test animals.
Skin sensitization Guinea pig: sensitizing	An allergic reaction on tissue after repeated exposure.
Chronic Data	
Chronic toxicity studies Liver (alteration and enlargement) and thyroid effects (hormone imbalances) at high dose levels (rats); decreased body weight gains.	Adverse health effects resulting from long-term exposure to a chemical, or long-term effects from short exposures.
Mutagenicity data This product does not pose a mutagenic hazard.	Effects of exposure to a substance that may change the genetic material in a living cell.
Reproductive/teratology data No birth defects were noted in rats and rabbits given dithiopyr technical orally during pregnancy. No effects were seen on the ability of male or female rats to reproduce when fed dithiopyr technical for two successive generations.	Effects of exposure that may affect the ability to reproduce viable offspring or cause birth defects.
Carcinogenicity data Benign thyroid tumors (species-specific). The U.S. EPA lists prodiamine as a possible human carcinogen based on limited evidence from animal studies.	The ability of a substance to cause cancer.

ATTACHMENT B (Sheet 8 of 9)

Sample MSDS With Section Explanations

Section 12. Ecological Information

MSDS contents (sample)	Explanation
Eco-acute toxicity <ul style="list-style-type: none">• Bluegill sunfish, 96-hour LC₅₀ : 0.47 mg/l• Rainbow trout, 96-hour LC₅₀ : 0.46 mg/l• Daphnia magna, 48-hour LC₅₀ : 5.2 mg/l• Bobwhite quail, 5-day dietary LC₅₀ : >5620 ppm• Mallard duck, 5-day dietary LC₅₀ : >5620 ppm• Bobwhite quail, Acute oral LC₅₀ : >2250 mg/kg• Honeybee, LD₅₀ : 81 g/bee	This section describes indicator species that were used in toxicity testing.
Environmental fate Photolysis: Unstable, half-life less than 1 hour. Hydrolysis: Stable soil half-life: 2 months.	The breakdown processes of a chemical when exposed to various environmental elements. Photolysis: Exposure to sunlight. Hydrolysis: Exposure to water.

Section 13. Disposal Considerations

MSDS contents (sample)	Explanation
Procedures For disposal, incinerate this material at a facility that complies with local, state and federal regulations.	Directions and limitations for disposal of the material.

Section 14. Transportation Information

MSDS contents (sample)	Explanation
Proper shipping name Triazine pesticide, liquid, toxic (cyanazine).	The official shipping name and description that should appear on U.S. Department of Transportation (DOT) shipping papers.
Hazard class Class 9.	DOT recognizes 9 classes of hazardous materials. Typically, the lower the number, the more hazardous the material.
UN No. UN 3082	The number assigned for identification by the United Nations (UN) convention.
Special information Marine pollutant.	Special provisions for a particular hazardous material.
Packing group III.	Specifies one or more packing groups for the material based on the hazard of great (I), medium (II), or minor (III) significance. May assist in selecting the proper packaging materials and labels.

ATTACHMENT B (Sheet 9 of 9)

Sample MSDS With Section Explanations

Section 15. Regulatory Information

MSDS contents (sample)	Explanation
Workplace classification This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).	The Occupational Safety and Health Administration's interpretation of the product's hazard to workers.
SARA Title 3 Section 311/312 Categorizations (40 CFR 372): This product is a hazardous chemical under 29 CFR 1910.1200, and is categorized as an immediate and delayed health, and flammability physical hazard.	Superfund Amendment and Reauthorization Act (SARA) category. SARA requires reporting any spill of any hazardous substance.
TSCA status Exempt from TSCA.	Toxic Substances Control Act statement regarding its regulation. This law covers the production and distribution of commercial and industrial chemicals in the United States.
RCRA classification Reactive	Resource Conservation and Recovery Act's classification. RCRA regulates hazardous waste generators and transporters.
CERCLA reportable quantity This material contains no hazardous or extremely hazardous substances as defined by CERCLA.	Comprehensive Environmental Response, Compensation and Liability Act's classification. CERCLA provides EPA authority to respond to releases of hazardous substances.

Section 16. Other Information

MSDS contents (sample)	Explanation
National Fire Protection Association (NFPA) ratings Health = 2; Flammability = 1; Reactivity = 0.	NFPA's scale: 0 = least; 1 = slight; 2 = moderate; 3 = high; 4 = extreme Class and properties of hazardous chemical data.
Issue date 1/2/92	Original MSDS publishing date.
Revised date 2/8/99	Date that MSDS was amended.
Supersedes 2/3/99	Date of previous MSDS.
Responsibility for MSDS Acme Agrosociences	
Address P.O. Box 12345 9330 Chemical Way Indianapolis, IN	
Telephone 800-555-1234	

ATTACHMENT D (Sheet 1 of 4)

Hazardous Materials Identification System (HMIS)

HMIS- The Hazardous Materials Identification System, was developed by the National Paint & Coatings Association (NPCA) to help employers comply with OSHA's Hazard Communication (HCS), 29 CFR 1910.1200.

The system utilizes colored bars, numbers and symbols to convey the hazards of chemicals used in the workplace.



Health

The Health section conveys the health hazards of the material. In the latest version of HMIS, the blue Health bar has two spaces, one for an asterisk and one for a numeric hazard rating. If present, the asterisk signifies a chronic health hazard, meaning that long-term exposure to the material could cause a health problem such as emphysema or kidney damage. NFPA lacks this important information because the NFPA system is meant only for emergency or acute (short-term) exposures.

4	Life-threatening, major or permanent damage may result from single or repeated overexposures.
3	Major injury likely unless prompt action is taken and medical treatment is given.
2	Temporary or minor injury may occur.
1	Irritation or minor reversible injury possible.
0	No significant risk to health.

Flammability

For HMIS I and II, the criteria used to assign numeric values (0 = low hazard to 4 = high hazard) are identical to those used by NFPA. In other words, in **this** category, the systems are identical. For HMIS III, the flammability criteria are defined according to OSHA standards:

4	Flammable gases, or very volatile flammable liquids with flash points below 73 °F, and boiling points below 100°F. Materials may ignite spontaneously with air. (Class IA) .
3	Materials capable of ignition under almost all normal temperature conditions. Includes flammable liquids with flash points below 73 °F and boiling points above 100 °F, as well as liquids with flash points between 73 °F and 100 °F. (Classes IB & IC).
2	Materials that must be moderately heated or exposed to high ambient temperatures before ignition will occur. Includes liquids having a flash point at or above 100 °F but below 200 °F. (Classes II & IIIA).
1	Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 °F. (Class IIIB).
0	Materials that will not burn.

ATTACHMENT D (Sheet 2 of 4)

Hazardous Materials Identification System (HMIS)

Reactivity (HMIS I and II - now obsolete)

The criteria used to assign numeric values (0 = low hazard to 4 = high hazard) were identical to those used by NFPA. In other words, in **this** category, the systems were identical.

This version is now obsolete. The yellow section has been replaced with an orange section titled **Physical Hazards** – see the next section for more information.

Physical Hazard (HMIS III)

Reactivity hazard are assessed using the OSHA criterion of physical hazard. Seven such hazard classes are recognized:

Water Reactives	Organic Peroxides	Explosives	Compressed Gases
Pyrophoric Materials	Oxidizers	Unstable Reactives	

This version replaces the now-obsolete yellow section titled **Reactivity**. See the previous section for more information. As with the Health and Flammability sections, the level of hazard is indicated using numeric values (0 = low hazard to 4 = high hazard):

4	Materials that are readily capable of explosive water reaction, detonation or explosive decomposition, polymerization, or self-reaction at normal temperature and pressure.
3	Materials that may form explosive mixtures with water and are capable of detonation or explosive reaction in the presence of a strong initiating source. Materials may polymerize, decompose, self-react, or undergo other chemical change at normal temperature and pressure with moderate risk of explosion.
2	Materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air.
1	Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.
0	Materials that are normally stable, even under fire conditions, and will not react with water, polymerize, decompose, condense, or self-react. Non-explosives.

ATTACHMENT D (Sheet 3 of 4)

Hazardous Materials Identification System (HMIS)

Personal Protection

This is by far the largest area of difference between the NFPA and HMIS systems. In the NFPA system, the white area is used to convey special hazards whereas HMIS uses the white section to indicate what personal protective equipment (PPE) should be used when working with the material.





































Note: The NPCA specifically recommends that "preparers of MSDSs **should not place HMIS PPE designation codes on the MSDSs or labels that leave the facility**, as they do not know the conditions under which their customers use those products." However, these still turn up on some MSDS's.

HMIS uses a letter coding system for this section. We at ILPI find this unacceptable because we would rather see the PPE listed explicitly instead of having employees try to remember a bunch of codes or consult a chart, something that could lead to confusion and/or a fatal accident. Likewise, the "custom codes" aspect is particularly dangerous for visitors and contractors who may not remember/recognize that these could vary from job site to job site.

We present the lettering scheme here, along with a series of graphics meant to reinforce the meaning of each letter.

ATTACHMENT D (Sheet 4 of 4)

Hazardous Materials Identification System (HMIS)

HMIS Letter	Required Equipment				
A	 Safety Glasses				
B	 Safety Glasses	 Gloves			
C	 Safety Glasses	 Gloves	 Protective Apron		
D	 Face Shield	 Gloves	 Protective Apron		
E	 Safety Glasses	 Gloves	 Dust Respirator		
F	 Safety Glasses	 Gloves	 Protective Apron	 Dust Respirator	
G	 Safety Glasses	 Gloves	 Vapor Respirator		
H	 Splash Goggles	 Gloves	 Protective Apron	 Vapor Respirator	
I	 Safety Glasses	 Gloves	 Dust Respirator	 Vapor Respirator	
J	 Splash Goggles	 Gloves	 Protective Apron	 Dust Respirator	 Vapor Respirator
K	 Air Line Mask or Hood	 Gloves	 Full Suit	 Boots	
L through Z	Site-specific label. Ask your supervisor or safety specialist for handling instructions.				

ATTACHMENT E (Sheet 1 of 2)

NFPA 704 Hazard Identification Rating System

NFPA 704 -Hazard Identification Rating System, the familiar NFPA "hazard diamond" for health, flammability, and instability. This identification system is designed to inform first responders. Additional information needs to be provided on the container label to meet the requirements of the Hazard Communication Standard.





	Health Hazard	
	4	Very short exposure could cause death or serious residual injury even though prompt medical attention was given.
	3	Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.
	2	Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
	1	Exposure could cause irritation but only minor residual injury even if no treatment is given.
	0	Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.





	Flammability	
	4	Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.
	3	Liquids and solids that can be ignited under almost all ambient conditions.
	2	Must be moderately heated or exposed to relatively high temperature before ignition can occur.
	1	Must be preheated before ignition can occur.
	0	Materials that will not burn.

ATTACHMENT E (Sheet 2 of 2)

NFPA 704 Hazard Identification Rating System

	Instability	
	4	Readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures.
	3	Capable of detonation or explosive reaction, but requires a strong initiating source or must be heated under confinement before initiation, or reacts explosively with water.
	2	Normally unstable and readily undergo violent decomposition but do not detonate. Also: may react violently with water or may form potentially explosive mixtures with water.
	1	Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.
	0	Normally stable, even under fire exposure conditions, and are not reactive with water.

	Special Hazards	
	<p>This section is used to denote special hazards. There are only two NFPA 704 approved symbols:</p> <p>OX This denotes an oxidizer, a chemical which can greatly increase the rate of <u>combustion</u>/fire.</p> <p>W Unusual reactivity with water. This indicates a potential hazard using water to fight a fire involving this material.</p>	

ACID	This indicates that the material is an acid, a corrosive material that has a pH lower than 7.0
ALK	This denotes an alkaline material, also called a base. These caustic materials have a pH greater than 7.0
COR	This denotes a material that is <u>corrosive</u> (it could be either an acid or a base).
	This is a another symbol used for corrosive .
	The skull and crossbones is used to denote a poison or highly toxic material. See also: CHIP Danger symbols.
	The international symbol for radioactivity is used to denote radioactive hazards; radioactive materials are extremely hazardous when inhaled.
	Indicates an explosive material. This symbol is somewhat redundant because explosives are easily recognized by their Instability Rating .

ATTACHMENT F (Sheet 1 of 4)

DEFINITIONS

PEL- Permissible Exposure Limit. The amount of material an employee can be exposed to, normally during an 8-hour work shift. The PEL is enforceable by the Maine Department of Labor.

PEL's can be defined in two different ways as discussed in the OSHA regulation on air contaminants, 1910.1000:

Ceiling Values - at no time should this exposure limit be exceeded. (Sometimes denoted with the letter C.)

8-hour Time Weighted Averages (TWA) - are an average value of exposure over the course of an 8 hour work shift.

TWA levels are usually lower than ceiling values. Thus, a worker may be exposed to a level higher than the TWA for part of the day (but still lower than the ceiling value) as long as he is exposed to levels below the TWA for the rest of the day. See 1910.1000 for the formulas used in the calculations.

REL- Recommended Exposure Limit. The recommended amount of material an employee can be exposed to during an 8-hour work shift. The REL is a recommendation from NIOSH and is not enforceable by the Maine Department of Labor.

TLV- Threshold Limit Value. Are guidelines (not standards) prepared by the American Conference of Governmental Industrial Hygienist, Inc. (ACGIH) to assist industrial hygienists in making decisions regarding safe levels of exposure to various hazards found in the workplace.

STEL- Are generally used only when toxic effects have been reported from high acute (short-term) exposures in either humans or animals. An STEL is not a separate independent exposure limit, but supplements time-weighted average limits where there are recognized acute effects from a substance whose toxic effects generally chronic (long-term) in nature.

- For example, one cannot be exposed to an STEL concentration if the TLV-TWA (time weighted average for an 8 hour shift; see Permissible Exposure Limit (PEL) would be exceeded. Workers can be exposed to a maximum of four STEL periods per 8-hour shift, with at least 60 minutes between exposure periods.

A Short Term Exposure Limit (STEL) is defined by ACGIH as the concentration to which workers can be exposed continuously for a short period of time without suffering from:

- Irritation
- Chronic or irreversible tissue damage
- Narcosis of sufficient degree to increase the likelihood of accidental injury, impair self-rescue or materially reduce work efficiency.

CAS - Chemical Abstracts Service Registry Number is a unique identifier that tells you, for example, that acetone and dimethyl ketone are actually the same substance. From a safety and inventory perspective, this is a terrific idea.

ATTACHMENT F (Sheet 2 of 4)

DEFINITIONS

NIOSH - National Institute of Occupational Safety and Health, operated by the Centers for Disease Control.

ACGIH - American Conference of Governmental Industrial Hygienists.

ANSI - American National Standards Institute- American National Standards Institute, ANSI, is a private, non-profit membership organization representing over 1,000 public and private organizations, businesses and government agencies. They seek to develop technical, political and policy consensus among various groups.

MDOL - Maine Department of Labor

NFPA - The National Fire Protection Association is a private non-profit organization, is the leading authoritative source of technical background, data, and consumer advice on fire protection, problems and prevention.

PPE - Personal Protective Equipment

Engineering Controls - Eliminate or reduce exposure to a chemical or physical hazard through the use or substitution of engineered machinery or equipment. Examples include self-capping syringe needles, ventilation systems such as a fume hood, sound-dampening materials to reduce noise levels, safety interlocks, and radiation shielding.

Toxic - falls in any of these three categories:

1. A chemical that has a median lethal dose (LD₅₀) of more than 50 milligrams per kilogram but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
2. A chemical that has a median lethal dose (LD₅₀) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.
3. A chemical that has a median lethal concentration (LD₅₀) in air of more than 200 parts per million, but not more than 2,000 parts per million by volume of gas or vapor, or more than two milligrams per liter, but not more than 20 milligrams per liter of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

ATTACHMENT F (Sheet 3 of 4)

DEFINITIONS

Highly toxic is defined as:

1. A chemical that has a median lethal dose (LD₅₀) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
2. A chemical that has a median lethal dose (LD₅₀) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.
3. A chemical that has a median lethal concentration (LD₅₀) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

Toxicology is the study of the nature, effects, detection, and mitigation of poisons and the treatment or prevention of poisoning.

Chemical - Any element, chemical compound or mixture of elements and/or compounds.

Combustible liquid - Any liquid having a flashpoint at or above 100°F (37.8°C), but below 200°F (93.3°C), except any mixture having components with flashpoints of 200°F (93.3°C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

Explosive - A chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

Flammable material - can be a solid, liquid or gas.

OSHA defines a flammable liquid as "any liquid having a flash point below 100°F. (37.8°C.), except any mixture having components with flash points of 100°F. (37.8°C.) or higher, the total of which make up 99 percent or more of the total volume of the mixture. Flammable liquids shall be known as Class I liquids."

Flammable limits - apply generally to vapors and are defined as the concentration range in which a flammable substance can produce a fire or explosion when an ignition source (such as a spark or open flame) is present. The concentration is generally expressed as percent fuel by volume.

- Above the **upper flammable limit** (UFL) the mixture of substance and air is too rich in fuel (deficient in oxygen) to burn. This is sometimes called the **upper explosive limit** (UEL).
- Below the **lower flammable limit** (LFL) the mixture of substance and air lacks sufficient fuel (substance) to burn. This is sometimes called the **lower explosive limit** (LEL).

Any concentration between these limits can ignite or explode -- use extreme caution! Being above the upper limit is not particularly safe, either. If a confined space is above the upper flammable limit and is then ventilated or opened to an air source, the vapor will be diluted and the concentration can drop into the flammable limit range.

ATTACHMENT F (Sheet 4 of 4)

DEFINITIONS

Solvent - A substance that dissolves another substance or substances to form a solution (a homogeneous mixture). The solvent is the component in the solution that is present in the largest amount or is the one that determines the state of matter (i.e. solid, liquid, gas) of the solution. Solvents are usually, but not always, liquids. They can also be gases or solids.

Ventilation - The process of supplying fresh air to an enclosed space in order to refresh/remove/replace the existing atmosphere. Ventilation is commonly used to remove contaminants such as fumes, dusts or vapors and provide a healthy and safe working environment; in other words, it is an engineering control. Ventilation can be accomplished by natural means (e.g., opening a window) or mechanical means (e.g., fans or blowers).

HAZARD COMMUNICATION PROGRAM EVALUATION

1. Has a list of all hazardous materials in the workplace been prepared? Yes No
2. Do you have a method for updating the hazardous materials list? Yes No
3. Have you obtained or developed an MSDS for each hazardous material used? Yes No
4. Has a system been developed to ensure that all incoming hazardous materials have labels and data sheets? Yes No
5. Are procedures in place to ensure secondary containers of hazardous materials have labels and data sheets? Yes No
6. Are employees aware of the requirements of the Hazard Communication Standard and information specific to their workplace? Yes No
7. Are employees familiar with the hazards of the chemicals in their workplace? Yes No
8. Have the employees been informed of the hazards associated with performing non-routine tasks? Yes No
9. Do employees understand how to detect the presence or release of hazardous materials in their workplace? Yes No
10. Are employees trained about proper work practices and personal protective equipment in relation to the hazardous materials in their work area? Yes No
11. Does the training program provide information on appropriate first aid, emergency procedures, and the likely symptoms of overexposure? Yes No
12. Does the training program include an explanation of labels and warnings that are used in each work area? Yes No
13. Does the training describe where employees obtain MSDS and how employees use them? Yes No
14. Is a system in place to ensure that new employees are trained before beginning work? Yes No
15. Is a system in place to identify new hazardous materials before they are introduced into a work area? Yes No
16. Is a system in place to inform employees of the hazards associated with newly introduced materials? Yes No