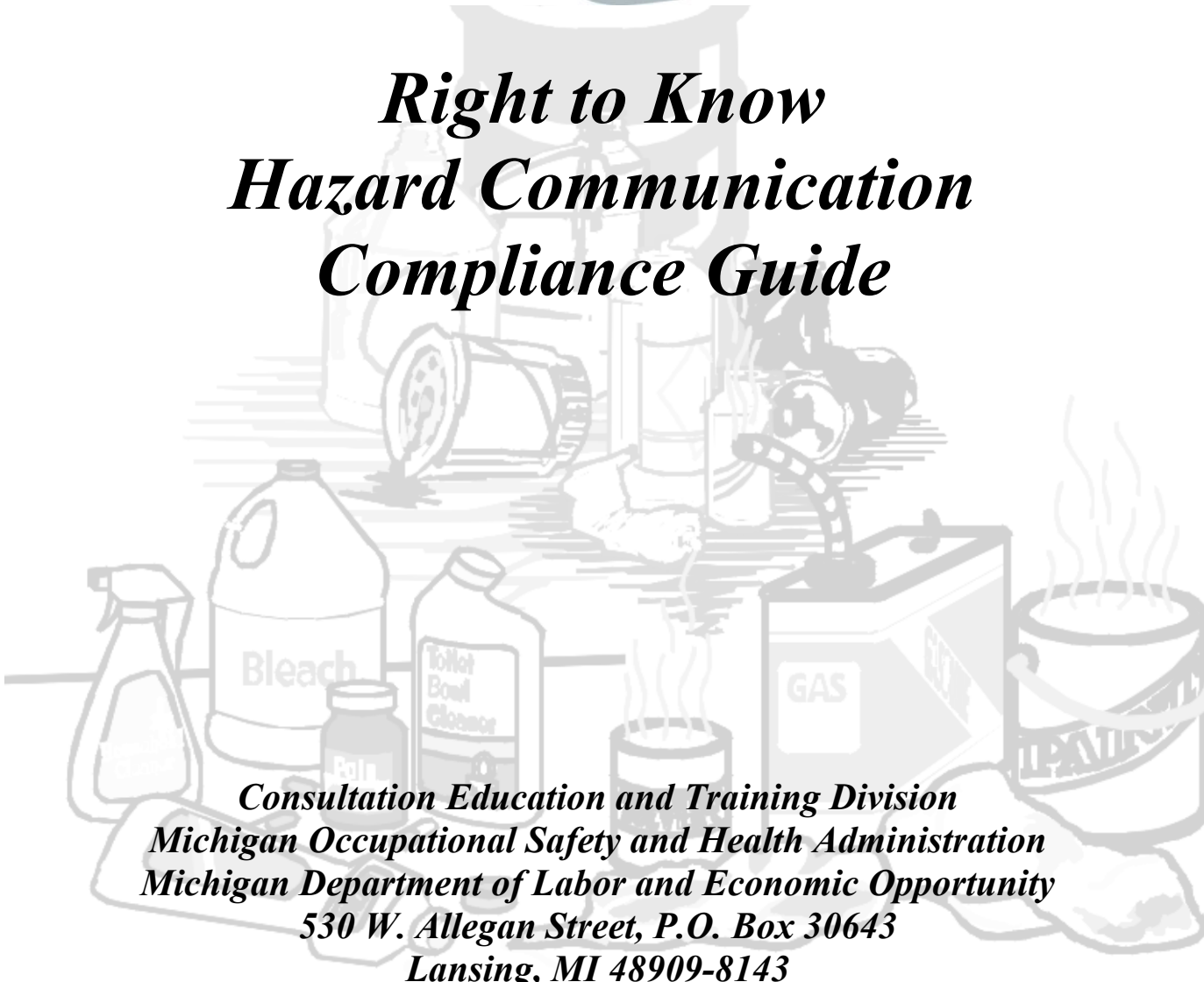




MIOsha

Michigan Occupational Safety
and Health Administration

Right to Know Hazard Communication Compliance Guide



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Michigan Occupational Safety and Health Administration
Michigan Department of Labor and Economic Opportunity
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NOTE:

This guidebook is not a substitute for Michigan's Right to Know Law, Michigan's Firefighter Right to Know Law, and Michigan's Community Right to Know Law. For details, consult the standards which are available from:

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Michigan Occupational Safety and Health Administration
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Introduction

The history of the Federal Occupational Safety and Health Act's Hazard Communication Standard (HCS) began in 1975. At that time, OSHA initiated programs calling for chemical manufacturers to label containers of hazardous chemicals. By 1977, OSHA had filed in the Federal Register for the standardization of hazardous chemical labeling. OSHA proposed the HCS again in March 1982, when it outlined five goals that together serve as the cornerstone for the current HCS.

The HCS was promulgated to ensure that all employers receive the information they need to inform and train their employees properly on the hazardous substances they work with and to help design and put in place employee protection programs. It also provides necessary hazard information to employees so they can participate in and support protective measures in place at their workplaces.

On April 7, 1986, a three-bill, Michigan Right to Know package was signed into law. The package, which is essentially an enhanced version of the Federal Right to Know program, requires all employees that work with hazardous chemicals to conform with the law regardless of their employer's status as manufacturer or non-manufacturer. The Right to Know Law was performance oriented.

- 1) **Michigan's Right to Know Law** - provided access to chemical information to workers whose jobs involve the routine use of hazardous chemicals. The requirements characteristic of the federal standard (29 C.F.R. 1910.1200) were adopted by the Michigan Right to Know Law - Part 42, 92 and 430. Hazard Communication.
- 2) **Michigan's Firefighter Right to Know Law** - provides the fire chief of the organized fire department for the jurisdiction in which the person is located the right to request and receive a list of chemicals and SDSs used at a specified location. Under the law, if the fire chief requests it, the following information must be provided within 10 working days of the query:
 - a) a listing of all hazardous chemicals at the location,
 - b) SDSs for all hazardous chemicals at the location, and
 - c) information pertaining to the quantity and location of the chemicals.

In addition, an employer must provide the fire chief with a written update when there is a significant change relating to fire hazards and the quantity, location, or presence of hazardous chemicals in the workplace.

- 3) **Michigan's Community Right to Know Law** - made it possible for any resident of an employer's county to request a listing of and SDSs for all hazardous chemicals present at that employer's workplace. We say made because the 1986 Superfund Amendment and Reauthorization Act (SARA) replaced the Community Right to Know Law, enforced by EPA. Under Title III of SARA, an employer is required to provide an even more comprehensive statement regarding hazardous chemicals in the workplace to members of the community.

MIOSHA adopted OSHA's HCS by reference on February 5, 2014. The Michigan Safety and Health Act (P.A. 154 of 1974 as amended), Section 14 was amended on December 27, 2013 to reflect changes in SDS.

Scope

The Right to Know Law applies to all Michigan employers. This section requires chemical manufacturers or importers to classify the hazards of chemicals which they produce or import, and all employers to provide information to their employees about the hazardous chemicals to which they are exposed, by means of a Hazard Communications Program, labels and other forms of warning, SDSs, and information and training. In addition, this section requires distributors to transmit the required information to employers. (Employers who do not produce or import chemicals need only focus on those parts of this rule that deal with establishing a workplace program and communicating information to their workers.)

All workers, who may be exposed to hazardous chemicals during the course of routine work or in a foreseeable emergency, are included under the Right to Know Law. Employees working in laboratories are covered under the Part 431 Hazardous Work in Laboratories Standard (Chemical Hygiene Plan).

Chemical Inventory

The written Hazard Communication Program must include a hazardous chemical or product inventory for substances used or stored at the facility. A "hazardous chemical" means any chemical which is classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified. Typical examples include gasoline, diesel fuel, motor oil, lubricants, hydraulic fluid, wood preservatives, wood finishes, solvents, and parts cleaners. A chemical inventory is the basis for completing the rest of the requirements of Michigan's Right to Know Law.

See Appendix A for an example of a Chemical Inventory List that can be used to create your own chemical inventory.

Classification of Hazardous Chemicals

Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to classify the chemicals in accordance with the Standard.

The chemical classification process involves identifying and considering the full range of available scientific literature and other evidence concerning the potential hazards. There is no requirement to test the chemical to determine how to classify its hazards. Appendix A to §1910.1200 shall be consulted for classification of health hazards, and Appendix B to §1910.1200 shall be consulted for the classification of physical hazards.

An employer may produce its own hazardous materials as products for sale or as by-products of research. In this case, the employer is responsible for developing SDSs and container labels for these materials.

Written Hazard Communication Program

Employers must develop, implement and maintain at the workplace a written, comprehensive Hazard Communication Program that includes container labeling, employee access to SDSs and an employee training program. The plan must also contain an inventory of the hazardous chemicals and details regarding how the employer will inform employees of the hazards associated with these substances. The employer, upon written request, must provide the written plan to employees, their designated representatives and MIOSHA representatives.

When outside contractors work at a facility, the resident company must ensure their safety from hazardous chemicals or products and include the following in the written Right to Know Program:

- How the facility will provide the outside contractor with copies of appropriate SDSs.
- How the company will inform the contractor of any precautionary measures they should take to protect employees during normal operations and during foreseeable emergencies.
- How the company will inform the contractor of the labeling system in use. The contract should specify the contractor's responsibility for training his/her employees with regard to the hazards associated with chemicals or products to which there may be exposure.

See Appendix B for a Sample Written Hazard Communication Program.

Labeling of Hazardous Chemicals

The Michigan Right to Know Law requires that containers housing hazardous substances be labeled. The intent of the law is to ensure that employees are fully informed as to the identities of the materials they are exposed to and any inherent danger to that employee if that substance is handled. Labels provide employees with an immediate source of information and should not under any circumstances be removed or defaced. Generally speaking, it is the manufacturer's responsibility to label all hazardous chemicals shipped out of the company's facility. However, if a hazardous chemical is transferred from a large container to a smaller (secondary) container, or a label falls off, you may find it necessary to produce or update a label.

For labels on shipped containers, the chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked. Where the chemical manufacturer or importer is required to label, tag or mark, the following shall be provided:

- Product identifier
- Signal word
- Hazard statement(s)
- Pictogram(s)
- Precautionary statement(s)
- Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Chemical manufacturer, importer, or distributor shall consult Appendix C which is used to determine which label elements apply to the substance. Label elements for each hazard class and associated hazard category for the hazardous chemical are to be prominently displayed and in English (other languages may also be included if appropriate).

Refer to CET# 5530, "Suggested Format for a Written Hazard Communication Program" for guidance related to labeling secondary containers.

Maintaining Safety Data Sheets (SDSs)

The SDS is a source of detailed information on a chemical or product and provides information of the hazards associated with the chemical or product. MIOSHA requires that copies of the SDSs for hazardous chemicals or products be readily accessible to employees at each work site and during each work shift. Federal law requires manufacturers and distributors of products containing hazardous substances to furnish customers with SDSs for each such substance or product. If you do not have a current SDS, you will need to request an SDS from the manufacturer.

The HCS requires chemical manufacturers, distributors, or importers to provide SDSs (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

Section 1. Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2. Hazard(s) identification includes all hazards regarding the chemical; required label elements.

Section 3. Composition/information on ingredients includes information on chemical ingredients; trade secret claims.

Section 4. First-aid measures includes important symptoms/effects, acute, delayed; required treatment.

Section 5. Firefighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.

Section 6. Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7. Handling and storage lists precautions for safe handling and storage, including incompatibilities.

Section 8. Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

Section 9. Physical and chemical properties lists the chemical's characteristics.

Section 10. Stability and reactivity lists chemical stability and possibility of hazardous reactions.

Section 11. Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12. Ecological information*

Section 13. Disposal considerations*

Section 14. Transport information*

Section 15. Regulatory information*

Section 16. Other information includes the date of preparation or last revision.

*Note: Since other Agencies regulate this information, MIOSHA will not be enforcing Sections 12 through 15.

Employers must ensure that SDSs are readily accessible to employees.

See Appendix D of 1910.1200 for a detailed description of SDS contents.

Posting Requirements

Appendix F contains two Michigan Right to Know posters that can be used to meet the posting requirements of the standard. The first poster (CET-2105) is designed to serve as a reminder to workers of their rights under the Michigan Right to Know Law and to provide information on how to locate SDSs and the Right to Know program for the worksite. The second poster (CET-2106) informs workers of any changes recently made to one or more SDSs. Whenever you receive or create an updated SDS, you must provide the necessary information on the poster within five days of receipt and display it in a prominent manner for a minimum of ten days.

Training of Employees

Information and training are a critical part of the Right to Know Program. Employers shall provide employees who are exposed to hazardous chemicals with effective information and training on hazardous chemicals in their work area at the time of their **initial assignment**, and **whenever a new chemical hazard the employees have not previously been trained about is introduced into their work area**. "Exposure or exposed" means that an employee is subjected, in the course of employment, to a chemical that is a physical or health hazard, and includes potential (e.g., accidental or possible) exposure. "Subjected" in terms of health hazards includes any route of entry (e.g., inhalation, ingestion, skin contact or absorption).

Information and training may be designed to cover hazard classifications of chemicals (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and SDSs.

Employees shall be informed of:

- Any operations in their work area where hazardous chemicals are present; and,
- The location and availability of the written Hazard Communications Program, including the required list(s) of hazardous chemicals and SDSs.

Employee training shall include at least:

- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.).
- The physical, health, simple asphyxiation, combustible dust, and pyrophoric gas hazards, as well as hazards not otherwise classified, of the chemicals in the work area.
- The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and PPE to be used.
- The details of the Hazard Communications Program developed by the employer, including an explanation of the labels received on shipped containers and the workplace labeling system used by their employer; the SDS, including the order of information and how employees can obtain and use the appropriate hazard information.

APPENDIX A

Suggestions for Creating a Chemical Inventory

1. Create a spreadsheet using programs such as Excel or Quattro Pro providing the information listed in section 2 below (Recommended).
2. Complete each section as listed:
 - a. Inventory taken by: List the name of the person who conducted the inventory
 - b. Company
 - c. Phone number
 - d. Date inventory initially compiled
 - e. Date of most recent revision
 - f. Supervisor/administrator
 - g. Product/chemical name as it appears on the container label
 - h. Maximum quantity to be stored
 - i. Location of product in the building
3. Sample inventory:

Below is an example of how an employer might maintain a chemical inventory.

Example Chemical Inventory List		
Inventory Taken by:	John Jones	Date inventory initially compiled: 02/28/11
Company:	ABC Widgets	Date of most recent revision: 02/28/12
Phone:	(313) 123-4567	Supervisor: Bill Smith
Product/Chemical Name	Maximum Quantity*	Location*
Acetone	15 gallons	Warehouse North Wing
Mineral Spirits	20 gallons	Warehouse North Wing
Sulfuric Acid	5 gallons	Laboratory

* Inventory quantity and location required under the Michigan Firefighters Right to Know Law, but not required for the Michigan Right to Know Chemical Inventory List.

APPENDIX B

Suggested Format for a Written Hazard Communication Program

General

The following Hazard Communications Program has been established for _____ (company name) _____. This program will be available for review by all employees.

Hazard Classification

Chemical manufacturers or importers shall evaluate chemicals they produced or import to classify the chemicals in accordance with the revised Hazard Communication Standard (HCS).

Effective June 1, 2015 - For each chemical, the chemical manufacturer or importer shall determine the hazard classes, and where appropriate, the category of each class that applies to the chemical being classified. This information will be placed in the Safety Data Sheet (SDS) and on the product label.

_____ (company name) _____ will rely on SDSs obtained from product suppliers to determine which chemicals are classified as hazardous for employees.

Labeling

- A. _____ (name or job title) _____ will be responsible for seeing that all containers entering the workplace from a manufacturer, importer or distributor are properly labeled.
- B. All labels shall be checked for:

Current requirements:	Requirements effective June 1, 2015:
1. Identity of the material. 2. Appropriate hazard warning for the material. 3. Name and address of the responsible party. (Only if the container is received from the manufacturer, distributor, or importer.)	1. Product identifier; 2. Signal word; 3. Hazard statement(s); 4. Pictogram(s); 5. Precautionary statement(s); and, 6. Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party.

- C. Each _____ (employee or supervisor) _____ shall be responsible for ensuring that all secondary containers used in their work area are labeled with the appropriate product identifier and provide employees with the specific information regarding the physical and health hazards of the hazardous chemical.

For workplace (secondary) containers, the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with **either**:

The information specified for labels on shipped containers; **OR**, product identifier and words, pictures, symbols, or combination thereof, which provide at least general information regarding the hazards of the chemicals, and which, in conjunction with the other information immediately available to employees under the Hazard Communications Program, will provide employees with the specific information regarding the physical and health hazards of the hazardous chemical.

SDS

Changes to SDS format effective June 1, 2015 - Chemical manufacturers or importers shall ensure that SDSs for their products includes the following Sections in order:

- Section 1. Identification;
- Section 2. Hazard(s) identification;
- Section 3. Composition/information on ingredients;
- Section 4. First-aid measures;
- Section 5. Firefighting measures;
- Section 6. Accidental release measures;
- Section 7. Handling and storage;
- Section 8. Exposure controls/personal protection;
- Section 9. Physical and chemical properties;
- Section 10. Stability and reactivity;
- Section 11. Toxicological information.
- Section 12. Ecological information;
- Section 13. Disposal considerations;
- Section 14. Transport information;
- Section 15. Regulatory information; and
- Section 16. Other information, including date of preparation or last revision.

- A. _____ (name or job title) _____ will be responsible for compiling and maintaining the master SDS file. The file will be kept in/at _____ (location) _____.
- B. Additional copies of SDSs for employee use are located in/at _____ (location) _____.
- C. SDSs will be available for review to all employees during each work shift. Copies will be available upon request to _____ (name or job title) _____.
- D. Posters identifying the person responsible for maintaining SDSs and where the SDSs are located are posted at _____ (location) _____. Posters notifying employees when new or revised SDSs are received will be located in the same location(s).
- E. If a required SDS is not received, _____ (name or job title) _____ shall contact the supplier, in writing, to request the MSDS/SDS. If an SDS is not received after two such requests, _____ (name or job title) _____ shall contact the MIOSHA's Construction Safety and Health Division at (517) 284-7680 or General Industry Safety and Health Division (GISHD) at (517) 284-7750, for assistance in obtaining the SDS.

MIOSHA does not maintain a library of SDSs. However, either of the above divisions will assist an employee in obtaining a copy of an SDS by contacting the employer or supplier.

Employee Information and Training

- A. _____ (name or job title) shall coordinate and maintain records of employee hazard communication training, including attendance rosters.
- B. Before their initial work assignment, each new employee will receive hazard communication training. This will include the following information and training:
- Information:
- The requirements of the MIOSHA HCS.
 - All operations in their work area where hazardous chemicals are present.
 - Location and availability of the written Hazard Communications Program, the list of hazardous chemicals, and the SDS.
- Training:
- Methods and observations that can be used to detect the presence or release of hazardous chemicals in the work area.
 - The physical, health, simple asphyxiation, combustible dust and pyrophoric gas hazards, as well as hazards not otherwise classified, of the chemicals in the work area.
 - Measures the employees should take to protect themselves from these hazards.
 - Details of the Hazard Communications Program-- including an explanation of the new label elements [product identifier; signal word; hazard statement(s); pictogram(s); and, precautionary statement(s)] on shipped containers and the workplace labeling system used by their employer; the new SDS format/sections.
 - How employees can obtain and use hazard information.
- C. The employee shall be informed that:
1. The employer is prohibited from discharging, or discriminating against, an employee who exercises his/her rights to obtain information regarding hazardous chemicals used in the workplace.
 2. As an alternative to requesting an SDS from the employer, the employee can seek assistance from the MIOSHA Construction Safety and Health Division, at (517) 284-7680, or the MIOSHA General Industry Safety and Health Division at (517) 284-7750, to obtain the desired SDS. A sign or MIOSHA poster will be posted with the address and telephone number of the MIOSHA divisions responsible for such requests.
- D. Before any new physical or health hazard is introduced into the workplace, each employee who may be exposed to the substance will be given information in the same manner as during the hazard communication training.

Hazardous Non-routine Tasks (Delete section if not applicable.)

- A. Occasionally, employees are required to perform non-routine tasks (i.e., clean reactor vessels, enter confined spaces, etc.). Prior to starting work in such areas, each employee will be given information about the hazards of the area or procedure. This information will include:
1. Specific chemical hazards.
 2. Protection/safety measures the employee can take to lessen risks of performing the task.
 3. Measures the company has taken to eliminate or control the hazard, including:
 - a. air monitoring,
 - b. ventilation requirements,
 - c. use of respirators,
 - d. use of attendants to observe procedures, and
 - e. emergency procedures.
- B. It is the policy of _____ (company name) that no employee will begin performance of a non-routine task without first receiving appropriate safety and health training.

C. Hazardous non-routine tasks we have at our facility include: List hazardous non-routine tasks.

Multi-Employer Worksites -- Informing Contractors

- A. If our company exposes any employee of another employer to any hazardous chemicals that we produce, use, or store, the following information will be supplied to that employer:
1. The hazardous chemicals they may encounter.
 2. Measures their employees can take to control or eliminate exposure to the hazardous chemicals.
 3. The container and pipe labeling system used on-site.
 4. Where applicable SDSs can be reviewed or obtained.
- B. Periodically, our employees may potentially be exposed to hazardous chemicals brought on our site by another employer. When this occurs, we will obtain from that employer information pertaining to the types of chemicals brought on-site, and measures that should be taken to control or eliminate exposure to the chemicals.
- C. It is the responsibility of _____ (name or job title) _____ to ensure that such information is provided and/or obtained prior to any services being performed by the off-site employer. To ensure that this is done the following mechanism will be followed: List all method(s) used to ensure the required information is provided or obtained.

Pipes and Piping Systems

Information on the hazardous contents of pipes and piping systems will be identified by: List means of identification for pipes and piping systems (i.e., label, sign, placard, written operating instructions, process sheet, batch ticket, etc.). Natural gas, steam and compressed air lines (with pressures exceeding 25 psig) must be identified in all industrial facilities. ANSI A13.1-1981 recommends the following colorations: blue for low-medium pressure oxygen and compressed air lines, yellow for variable-high pressure oxygen and compressed air lines, and yellow for acetylene and natural gas lines.

List of Hazardous Chemicals

A list of all hazardous chemicals used by _____ (company name) _____ is located _____ (location of chemical list) _____. Further information regarding any of these chemicals can be obtained by reviewing its respective SDS.

Materials which can be purchased by the ordinary household consumer, and which are used for the intended purpose and amount as by the ordinary household consumer, are not required to be included in this list. (It is suggested that you maintain a separate list of all materials you consider to be "consumer use" materials.)

NOTE: This sample program is applicable to most employers in Michigan. The federal OSHA HCS (29 CFR 1910.1200, effective date May 25, 2012) contains information of particular interest to employers such as retailers, wholesalers, warehouses and employers who work at multiple job sites. All employers are strongly recommended to read the new HCS to determine its applicability to their workplace. Copies of the standard can be obtained by contacting:

Michigan Department of Labor and Economic Opportunity
Michigan Occupational Safety and Health Administration

Technical Services Division	
Regulatory Services Section	517-284-7740

Consultation Education and Training Division	517-284-7720
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APPENDIX C

Determination of Hazardous Piping Systems

Pipe Labeling Guidelines

Listed below is a sample table that may be used to identify potentially hazardous materials contained in piping systems. For questions regarding Pipe Labeling Requirements, contact Michigan's Occupational Safety and Health Administration's (MIOSHA's) CET Division at (517) 284-7720, General Industry Safety and Health Division at (517) 284-7750, or Construction Safety and Health Division at (517) 284-7680.

Information on the hazardous contents of pipes and piping systems will be identified by a label, sign, placard, written operating instructions, process sheet, batch ticket, or a substance identification system that conveys the same information required to be displayed on a label by the standard (29 C.F.R. 1910.1200 Michigan Right to Know Law - Part 42, 92 and 430. Hazard Communication Standard) incorporated by reference in Section 14a of Act 154.

HazCom Piping Classes				
PIPE SYSTEM	POTENTIAL HAZARD	PROTECTIVE EQUIPMENT	HAZARD TYPE	COMMENTS
Sanitary Sewer	Biological contamination	Skin and eye protection	Biological	Wash skin if contacted, decon with bleach
Hot Water Supply/Return	Thermal burns	Skin and eye protection	Physical Haz	
Natural Gas	Explosion and asphyxiation	Eye protection Fire extinguisher	Flammable gas	Prevent sparks, may fill confined space, ventilate
Compressed Air	Particulate impact damage	Eye protection	Physical Haz	Do not use to clean clothing
Steam and Steam Condensate	Thermal burns	Skin and eye protection	Physical Haz	
High Pressure Steam	Thermal burns	Skin and eye protection	Physical Haz	
Oxygen	Fire, hyperoxia	Fire extinguisher	Oxidizer (accelerates flammability)	High concentrations may cause fire, ventilate

APPENDIX D

SDS Request Form

TO: CHEMICAL MANUFACTURER, IMPORTER OR DISTRIBUTOR

As you are aware, MIOSHA requires employers to provide training to their employees concerning the hazards of chemicals or other hazardous materials.

To properly train our employees, we need a Safety Data Sheet (SDS) for one of your products,

Your prompt attention is necessary to maintain a proper level of safety for our employees. Please send the SDS for the requested hazardous chemical/material no later than _____.

Sincerely,

APPENDIX E

Glossary of Terms Used on an SDS

<u>Acute</u> -	Short term period of action. Readily apparent.
<u>Acute Toxicity</u> -	Acute toxicity refers to those adverse effects occurring following oral or dermal administration of a single dose of a substance, or multiple doses given within 24 hours, or an inhalation exposure of 4 hours.
<u>Asphyxiate</u> -	A gas or vapor that can cause injury, unconsciousness or death by suffocation by reducing the amount of oxygen sufficient to promote life. See definition for "Simple Asphyxiant."
<u>Aspiration</u> -	The entry of a liquid or solid chemical directly through the oral or nasal cavity, or indirectly from vomiting, into the trachea and lower respiratory system.
<u>Aspiration Toxicity</u> -	Severe acute effects such as chemical pneumonia, varying degrees of pulmonary injury or death following aspiration.
<u>Boiling Point</u> -	A temperature at which a liquid turns to a vapor state. This term is usually associated with the temperature at sea level pressure when a flammable liquid gives off sufficient vapors to promote combustion.
<u>Carcinogen</u> -	A substance or a mixture of substances which induce cancer or increase its incidence. Substances and mixtures which have induced benign and malignant tumors in well-performed experimental studies on animals are considered also to be presumed or suspected human carcinogens unless there is strong evidence that the mechanism of tumor formation is not relevant for humans.
<u>"C" or Ceiling</u> -	In terms of exposure concentrations, this is the concentration that should never be exceeded, even for a short period, for a substance.
<u>Chronic</u> -	A long time period of action.
<u>Chronic Effect</u> -	An adverse effect with symptoms that develop or recur very slowly, or over long periods of time. See definitions for "Specific Target Organ Toxicity – Repeated Exposure (STOT-RE)." Refer to MIOSHA Part 42, 92 and 430 Hazard Communication, Appendix A for additional information.
<u>Combustible Dust</u> -	A combustible particulate solid that presents a fire or deflagration hazard when suspended in air or some other oxidizing medium over a range of concentrations, regardless of particle size or shape. Definition from OSHA National Emphasis Program (CPL-03-00-008) on Combustible Dust as this term is not defined in MIOSHA Part 42, 92 and 430 Hazard Communication Standard.
<u>Compressed Gas</u> -	Gases which are contained in a receptacle at a pressure of 200 kPa (29 psi) (gauge) or more.
<u>Concentration</u> -	A figure used to define relative quantity of a particular material; such as, a mixture of 5 ppm Acetone in air.

<u>Corrosive Material</u> -	See definitions for “Corrosive to Metals” and “Skin Corrosion.” Many acids are classified as corrosives.
<u>Corrosive to Metals</u> -	A chemical which by chemical action will materially damage, or even destroy, metals.
<u>Decomposition</u> -	The breakdown of materials or substances into other substances or parts of compounds; usually associated with heat or chemical reactions.
<u>Dermal</u> -	Used on or applied to the skin.
<u>Dermal Toxicity</u> -	The adverse effects resulting from exposure of a material to the skin; usually associated with lab animal tests.
<u>Evaporation Rate</u> -	The rate at which a liquid material is known to evaporate, usually associated with flammable materials. The faster a material will evaporate, the sooner it will become concentrated in the air, possibly creating either an explosive/combustible mixture or toxic concentration, or both.
<u>Explosive Chemicals</u> -	A solid or liquid chemical which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic chemicals are included even when they do not evolve gases.
<u>Exposure</u> -	Contact of an individual with a hazardous material during the course of employment, through any route of entry (e.g., inhalation, ingestion, skin contact or absorption).
<u>Eye Irritation</u> -	The production of changes in the eye following the application of test substance to the anterior surface of the eye; which are fully reversible within 21 days of application.
<u>Flammable Gas</u> -	A gas having a flammable range with air at 20°C (68°F) and a standard pressure of 101.3 kPa (14.7 psi).
<u>Flammable Liquid</u> -	Flammable liquid means a liquid having a flash point of not more than 93°C (199.4°F).
<u>Flammable Solid</u> -	Flammable solid means a solid that is a readily combustible, or which may cause or contribute to fire through friction.
<u>Flash Point</u> -	The minimum temperature at which a liquid gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid, as determined by a method identified in Hazard Communication Standard, Appendix B, Section B.6.3.
<u>General Exhaust</u> -	A term used to define a system for exhausting or ventilating air from a general work area. Not as site specific as localized exhaust.
<u>“g”, gram</u> -	A unit of weight. One ounce equals about 28.4 grams.

<u>HMIS®</u> -	<p>Hazardous Material Identification System - a numerical hazard rating that incorporates the use of labels with color-coded bars as well as training materials. It was developed by the American Coatings Association. The four bars are color coded, using the modern color bar symbols with blue indicating the level of health hazard, red for flammability, orange for a physical hazard, and white for Personal Protection. The number ratings range from 0-4 with 4 representing the greatest hazard.</p> <p>Reference link: https://www.paint.org/advocacy/occupational-health-and-safety/hmis/</p>
<u>Hazard Category</u> -	The division or criteria within a given hazard class. For example, oral acute toxicity and flammable liquids include four hazard categories. These hazard categories compare hazard severity, within a hazard class. They should not be taken as a comparison of hazard categories more generally.
<u>Hazard Class</u> -	The nature of the physical or health hazards (e.g., flammable solid, carcinogen, oral acute toxicity).
<u>Hazard Not Otherwise Classified (HNOC)</u> -	An adverse physical or health effect identified through evaluation of scientific evidence during the classification process that does not meet the specified criteria for the physical and health hazard classes addressed in this section. This does not extend coverage to adverse physical and health effects for which there is a hazard class addressed in this section, but the effect either falls below the cut-off value/concentration limit of the hazard class or is under a GHS hazard category that has not been adopted by OSHA (e.g., acute toxicity Category 5).
<u>Hazard Statement</u> -	A statement assigned to a hazard class and category that describes the nature of the hazard(s) of a chemical, including, where appropriate, the degree of hazard.
<u>Hazardous Chemical</u> -	Any chemical which is classified as a physical hazard or a health hazard, a simple asphyxiant, combustible dust, pyrophoric gas, or hazard not otherwise classified (HNOC).
<u>Health Hazard</u> -	A chemical which is classified as posing one of the following hazardous effects: acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); or aspiration hazard. The criteria for determining whether a chemical is classified as a health hazard is detailed in Appendix A to Part 42, 92 and 430 Hazard Communication Standard -- Health Hazard Criteria.
<u>Incompatible</u> -	Materials that could cause dangerous reactions from direct contact with one another.
<u>Ingestion</u> -	Taking in of a substance through the mouth.
<u>Inhalation</u> -	The breathing in of a substance in the form of a gas, liquid, vapor, dust, mist or fume.
<u>Inhibitor</u> -	A chemical added to another substance to prevent an unwanted change from occurring.
<u>Irritant</u> -	A chemical substance or mixture, other than a corrosive, that when contacted with the skin produces a reversible inflammatory reaction to the affected area and/or surrounding areas. Normally, irritants affect the eyes, nose, mouth and respiratory system.

<u>LC</u> -	Lethal Concentration - In lab animal tests, this is the concentration of a substance which is sufficient to kill the tested animal.
<u>LC₅₀</u> -	Median Lethal Concentration - The concentration in air of gas, vapor, mist, fume or dust for a given period of time that will kill 50 percent of the test animals using a specified test procedure. Inhalation is the primary route of entry.
<u>LD₅₀</u> -	Median Lethal Dose - The dosage of a substance that will kill 50 percent of the test animals to which the substance is administered using a specified test procedure. Various routes of entry can be used for testing purposes.
<u>LEL</u> -	Lower Exposure Limit - The lowest concentration of a gas or vapor in the air that will ignite or explode if an ignition source is introduced.
<u>Mutagen</u> -	A permanent change in the amount or structure of the genetic material in a cell. The term mutation applies both to heritable genetic changes that may be manifested at the phenotypic level and to the underlying DNA modifications when known (including, for example, specific base pair changes and chromosomal translocations). The term mutagenic and mutagen will be used for agents giving rise to an increased occurrence of mutations in populations of cells and/or organisms.
<u>NFPA</u> -	National Fire Protection Association - An organization that promotes fire protection/prevention and establishes safeguards against loss of property and/or life by fire. The NFPA has established a series of codes identifying hazardous materials by symbol and number for firefighting purposes. These codes also classify materials in their order of flammability. With 0 being not burnable up to 4 which means it will burn spontaneously at room temperature. Reference link: https://www.nfpa.org/Assets/files/AboutTheCodes/704/NFPA704_HC2012_QC_ard.pdf
<u>Olfactory</u> -	Relating to the sense of smell.
<u>Oral</u> -	Used in or taken through the mouth into the body.
<u>Organic Peroxide</u> -	A liquid or solid organic chemical which contains the bivalent -O-O- structure and as such is considered a derivative of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. The term organic peroxide includes organic peroxide mixtures, containing at least one organic peroxide. Organic peroxides are thermally unstable chemicals, which may undergo exothermic self-accelerating decomposition. In addition, they may have one or more of the following properties: <ul style="list-style-type: none"> (a) Be liable to explosive decomposition; (b) Burn rapidly; (c) Be sensitive to impact or friction; (d) React dangerously with other substances.
<u>Oxidizer</u> -	A chemical that yields oxygen readily and promotes combustion in other materials. The definition does not include explosives.
<u>Oxidizing Gas</u> -	Any gas which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does.
<u>Oxidizing Liquid</u> -	A liquid which, while in itself is not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.


<u>Oxidizing Solid</u> -	A solid which, while in itself is not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.
<u>PEL</u> -	Permissible Exposure Limit - An exposure concentration established by the Occupational Safety and Health Community which indicates the maximum concentration for which no adverse effects will follow.
<u>PPM</u> -	Parts per Million - A unit of measurement for the concentration of a gas or vapor in air; usually expressed as number of parts per million parts of air.
<u>PPB</u> -	Parts per Billion - As above, only expressed as number of parts per billion parts of air.
<u>Physical Hazard</u> -	A chemical that is classified as posing one of the following hazardous effects: explosive; flammable (gases, aerosols, liquids, or solids); oxidizer (liquid, solid or gas); self-reactive; pyrophoric (liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; or in contact with water, emits flammable gas. See Appendix B to Part 42, 92 and 430 Hazard Communication Standard -- Physical Hazard Criteria.
<u>Pictogram</u> -	A composition that may include a symbol plus other graphic elements, such as a border, background pattern, or color, that is intended to convey specific information about the hazards of a chemical. Eight pictograms are designated under this standard for application to a hazard category.
<u>Pyrophoric Gas</u> -	A chemical in a gaseous state that will ignite spontaneously in air at a temperature of 130 degrees F (54.4 degrees C) or below.
<u>Pyrophoric Liquid</u> -	A liquid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air.
<u>Pyrophoric Solid</u> -	A solid which, even in small quantities, is liable to ignite within five minutes after coming into contact with air.
<u>Pyrotechnic Chemical</u> -	A chemical designed to produce an effect by heat, light, sound, gas or smoke or a combination of these as the result of non-detonative self-sustaining exothermic chemical reactions.
<u>Reactive Material</u> -	A chemical substance or mixture that may vigorously polymerize, decompose, condense, or become self-reactive under conditions of shock, pressure or temperature. Includes chemical substances that can be classified as explosive, organic peroxide, a pressure generating material or a water reactive material.
<u>Reactivity</u> -	The term that describes the tendency of a substance to undergo a chemical change with the release of energy, often as heat. See definition for "Reactive Material."
<u>Reducing Agent</u> -	In an oxidation reaction, this is the material that combines with oxygen.
<u>Reproductive Toxicity</u> -	Includes adverse effects on sexual function and fertility in adult males and females, as well as adverse effects on development of the offspring. Some reproductive toxic effects cannot be clearly assigned to either impairment of sexual function and fertility or to developmental toxicity. Nonetheless, chemicals with these effects are classified as reproductive toxicants.

<u>Respiratory System</u> -	The breathing system, including the lungs, and air passages, plus their associated nervous and circulatory components.
<u>Respiratory Sensitizer</u> -	A chemical that will lead to hypersensitivity of the airways following inhalation of the chemical.
<u>SDS</u> -	Safety Data Sheet - An informational document that contains relevant information about a specific chemical or mixture. Also lists the hazards of the chemical, appropriate emergency response procedures, and protective equipment that should be worn, etc.
<u>STEL</u> -	Short Term Exposure Limit - The maximum allowable concentration of a substance that one can be exposed to for less than 15 minutes and not produce adverse health effects.
<u>Self-heating Chemical</u> -	A solid or liquid chemical, other than a pyrophoric liquid or solid, which, by reaction with air and without energy supply, is liable to self-heat; this chemical differs from a pyrophoric liquid or solid in that it will ignite only when in large amounts (kilograms) and after long periods of time (hours or days).
<u>Self-reactive Chemicals</u> -	Thermally unstable liquid or solid chemicals liable to undergo a strongly exothermic decomposition even without participation of oxygen (air).
<u>Sensitizer</u> -	See definitions for "Respiratory Sensitizer" and "Skin Sensitizer."
<u>Serious Eye Damage</u> -	The production of tissue damage in the eye, or serious physical decay of vision, following application of a test substance to the anterior surface of the eye, which is not fully reversible within 21 days of application.
<u>Simple Asphyxiant</u> -	A substance or mixture that displaces oxygen in the ambient atmosphere and can thus cause oxygen deprivation in those who are exposed, leading to unconsciousness and death.
<u>Skin Corrosion</u> -	The production of irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis, following the application of a test substance for up to 4 hours. Corrosive reactions are typified by ulcers, bleeding, bloody scabs, and, by the end of observation at 14 days, by discoloration due to blanching of the skin, complete areas of alopecia, and scars. Histopathology should be considered to evaluate questionable lesions.
<u>Skin Irritation</u> -	The production of reversible damage to the skin following the application of a test substance for up to 4 hours.
<u>Skin Sensitizer</u> -	A chemical that will lead to an allergic response following skin contact.
<u>Specific Gravity</u> -	The weight of a material compared to the weight of an equal volume of water. Usually expresses a material's heaviness. A material with a specific gravity of greater than 1.0 will sink to the bottom of water; whereas a material with a specific gravity of less than 1.0 will float on top of water.
<u>Specific Target Organ Toxicity - Repeated Exposure (STOT-RE)</u>	Specific target organ toxicity arising from repeated exposure to a substance or mixture.
<u>Specific Target Organ Toxicity - Single Exposure (STOT-SE)</u>	Specific, non-lethal target organ toxicity arising from a single exposure to a chemical.

<u>TLV</u> -	Threshold Limit Values - These are the upper exposure limits of airborne concentrations of chemicals that are accepted as safe for employees to be exposed to on a day-in, day-out basis.
<u>TWA</u> -	Time Weighted Average - This is the maximum airborne concentration of a material that employees working eight hours per day, 40 hours per week can be exposed to with no adverse physical effects.
<u>Toxic</u> -	See definition for "Acute Toxicity."
<u>UEL</u> -	Upper Explosive Limit - The highest concentration of a gas or vapor in air that will sustain or support combustion, when an ignition source is present.
<u>Unstable</u> -	A chemical or substance in a pure state (nothing added) that will readily polymerize, decompose, condense, or become self-reactive under conditions of shock, pressure or temperature.
<u>Vapor Density</u> -	A term used to define the weight of a vapor or gas as compared to the weight of an equal volume of air. Materials lighter than air have a vapor density of less than 1.0, whereas materials heavier than air have a vapor density greater than 1.0.
<u>Vapor Pressure</u> -	A number used to describe the pressure that a saturated vapor will exert on top of its own liquid in a closed container. Usually, the higher the vapor pressure, the lower the boiling point, and therefore the more dangerous the material can be, if flammable.

APPENDIX F

Michigan's Right to Know Law Posters



***This Workplace
Covered
by the
Michigan
Right To Know Law***

Employers must make available for employees in a readily accessible manner, Safety Data Sheets (SDS) for those hazardous chemicals in their workplace.

Employees cannot be discharged or discriminated against for exercising their rights including the request for information on hazardous chemicals.

Employees must be notified and given direction (by employer posting) for locating Safety Data Sheets and the receipt of new or revised SDS(s).

When the employer has not provided a SDS, employees may request assistance in obtaining SDS from the:

Michigan Department of Labor and Economic Opportunity (LEO)
Michigan Occupational Safety and Health Administration
General Industry Safety and Health Division (517) 284-7750
Construction Safety and Health Division and Asbestos Licensing (517) 284-7680
www.michigan.gov/miosha

MIOSHA/CET #2105 (Rev. 12/19)

**SDS(s) For This
Workplace Are
Located At**

Location(s)

Location(s)

Person(s) responsible for SDS(s)

Phone

LEO is an equal opportunity employer/program.

APPENDIX G

SDS Quiz

- 1) What is an SDS?
- A. Safety Document Sheet
 - B. Sheet Documenting Safety
 - C. Safety Data Sheet
- 2) All SDS forms contain the same information in the same order.
- True False
- 3) Only supervisors must be trained to detect hazardous chemicals that are released in the workplace.
- True False
- 4) Each SDS contains information on emergency first aid treatment.
- True False
- 5) You have the right to request a copy of a SDS.
- True False
- 6) Training is only required at the time of hire; even if new hazards are introduced into the workplace.
- True False
- 7) SDSs must be physically attached to each chemical shipment; including re-orders of the same chemical.
- True False
- 8) The SDS tells you how to clean up spills and leaks.
- True False
- 9) An SDS will list various routes of entry for a chemical exposure. Give an example of a route of entry: _____
- 10) The purpose of MIOSHA's Right to Know Law is to make sure that needed information reaches all employees and workers who use hazardous materials.
- True False

APPENDIX H

SDS Quiz Key

SDS Quiz Key

- 1) Safety Data Sheet
- 2) True - There is now a specific 16-section format required for an SDS.
- 3) False - All individuals working with hazardous chemicals must be trained to detect a hazardous chemical's presence in the event of a leak.
- 4) True - Emergency first aid information can be located under the section for Health Hazard Information.
- 5) True - Copies of SDSs for hazardous chemicals or products must be readily accessible to employees at each work site and during each work shift.
- 6) False - Retraining may be required if an individual changes job duties, a new chemical/hazard is introduced into the work environment, or if it is determined that initial training was deficient.
- 7) False - An SDS will accompany the initial chemical shipment but is not required to be physically attached to the item, nor required to be sent again each time the employer re-orders the same chemical.
- 8) True - The information on how to handle a spill or leak is located under the section for Safe Handling and Use.
- 9) Examples of routes of entry include inhalation, ingestion, skin absorption, splash to the eye, and a puncture injury.
- 10) True.

NOTES

[illegible]



Michigan Department of Labor and Economic Opportunity
Michigan Occupational Safety and Health Administration
Consultation Education and Training Division
530 W. Allegan Street, P.O. Box 30643
Lansing, Michigan 48909-8143

For further information or to request consultation, education and training services
call 517-284-7720

or

visit our website at www.michigan.gov/miosha



www.michigan.gov/leo

LEO is an equal opportunity employer/program.