

**SHINTECH
INCORPORATED**

**HAZARD
COMMUNICATION
STANDARD**

29CFR1910.1200

SHINTECH INCORPORATED
SAFETY
HAZARD COMMUNICATIONS
DOCUMENT NUMBER: SFHC1200

EFFECTIVE DATE 11/10/94
PREPARED BY: B.G. POLK
APPROVED BY: *BBP*
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SHINTECH INCORPORATED
HAZARD COMMUNICATION
EMPLOYEE INFORMATION PROGRAM
(OSHA CFR 1910.1200)

In compliance with the "Hazard Communication Standard" OSHA CFR 1910.1200, (OSHA Right-To-Know), Shintech Incorporated is implementing this written hazard communication program. This written program must be made available to employees, their designated representatives, the Assistant Secretary for Occupational Safety and Health, and the Director of the National Institute for Occupational Safety and Health.

It is the goal of this standard to improve the awareness among employees working with or exposed to hazardous chemicals and the risks involved. The effectiveness of any safety program is directly proportional to the degree of safety awareness of the employees involved. We must be aware of potential hazardous chemicals before we can work safely. With this in mind, it is important that supervisors train and motivate employees to increase their safety awareness when exposed to hazardous chemicals and other hazards associated with their work.

A. THE HAZARD COMMUNICATION STANDARD

Exposure to chemicals in the workplace may cause or contribute to many serious health effects. Some chemicals may also have the potential to cause fires, explosions and/or other serious accidents. Because of these health and safety effects, and the lack of information available to many employees and employers, the Occupational Safety and Health Administration (OSHA) issued a new standard entitled "Hazard Communication" (29 CFR 1910.1200), more commonly known as OSHA Right-To-Know. The goal of this standard is to reduce the incidence of chemical source illnesses and injuries in the manufacturing industries.

The purpose of the hazard communication standard is to make sure that:

The hazards of all chemicals produced, imported, and/or used are evaluated

The hazards information is transmitted to affected employees and employers

The hazard information is transmitted by means of labels on containers and Material Safety Data Sheets (MSDS) and training.

COMPONENTS OF THE STANDARD

1. Container Labels and Other Forms of Warning

Chemical manufacturers, importers, and distributors must be sure that containers of hazardous chemicals leaving the workplace are labeled, tagged and/or marked with the identity, appropriate hazard warning, and the name and address of the manufacturer or other responsible party.

In the workplace, each container must be labeled, and/or marked with the identity of the hazardous chemicals contained therein, and must show hazard warnings appropriate for employee protection. The hazard warning can be any type of message, word, pictures, and/or symbols which convey the hazards of the chemical(s) in the container. Labels must be legible, in English (plus other languages, if desired), and prominently displayed.

Exemptions to in-plant individual container labels are:

Posted signs or placards, which convey the hazard information when there are a number of stationary containers within a work area which have similar contents and hazards.

Standard operating procedures, process sheets, batch tickets, blend tickets, and similar written materials are substituted for container labels on stationary process equipment and contain the same information, and are readily available to employees in the workplace.

Portable containers, into which hazardous chemicals are transferred from labeled containers, are not required to be labeled when they are intended only for the immediate use of the employee who makes the transfer.

Pipes or piping systems are not required to be labeled.

2. Material Safety Data Sheets (MSDS)

Chemical manufacturers and importers must develop material safety data sheets for each hazardous chemical they produce or import. Employers are responsible for obtaining or developing a MSDS for each hazardous chemical used in their workplace.

Beyond the identity information, the MSDS must provide information on the physical and chemical characteristic of the hazardous chemical; known acute and chronic health effects and related health information; exposure limits; whether the chemical is considered to be carcinogen by NTP, IARC, or OSHA; precautionary measures, emergency and first aid procedures; and the identification of the organization responsible for preparing the sheet.

In addition, the MSDS sheet must inform users of the chemical of the symptoms of exposure, such as dryness of the throat, headache or nausea, chest pains, cough, etc.

Each MSDS must also indicate the date of the preparation and/or date of latest update of the MSDS.

Copies of the material safety data sheet for hazardous chemicals are to be readily accessible to employees. As a source of detailed information on hazards. They must be located close to workers, and readily available to them during each workshift.

3. EMPLOYEE INFORMATION AND TRAINING

Shintech Incorporated employees exposed to hazardous chemicals must be given a training and information program that covers the following topics:

A. Information

1. The OSHA Hazard Communication Standard and its requirements.
2. The components of the hazard Communication Standard in the plant.
3. Operations and locations where the hazardous chemicals are present.
4. Where the hazard evaluation procedures, communications program, list of hazardous chemicals and the material safety data sheets are maintained.

B. Training

1. How the Hazard Communication Program is implemented in the plant.
2. How to read and interpret information on labels and material safety data sheets.
3. How to obtain and use the hazard information.
4. A list of hazardous chemicals in the plant (MSDS).
5. Measures employees can take to protect themselves from the hazards (JSA's).
6. The hazards of the chemicals in the plant.
7. Specific procedures put into effect to provide the employee with protection such as work practices and the use of personal protective devices (PPE).
8. Methods and observations, such as visual appearance or smell, employees can use to detect the presence of a hazardous chemical they may be exposed to.

Whenever a new hazardous chemical is introduced into the work area, the employees must be given training and information concerning the chemical as outlined in 3, A and B.

DOCUMENTATION

All training sessions must be documented. Employees must sign an attendance record. This record must be maintained with other training and safety records.

D. RESPONSIBILITIES

I. Training - Initial training will be provided by the Environmental Control Supervisor at the onset of this regulation.

New Chemicals- As new chemicals are introduced into the workplace, the Shift Supervisor will conduct the training required by this regulation.

Refresher - As requested by department superintendents, the Environmental Control Supervisor will conduct refresher training as regards to this regulation.

II. DOCUMENTATION

MSDS,s - Copies of MSDS sheets will be maintained in the control rooms of all plants, in the Material handling Warehouse, K-Bin, shift supervisors office, in purchasing and receiving, and in the Environmental Control Supervisors office.

Contact - The name of the person who will be responsible for implementation of this program will be posted on the bulletin board of all affected areas.

E. ACCESS TO EMPLOYEE EXPOSURE AND MEDICAL RECORDS (OSHA 29 CFR 1910.20)

SHINTECH-000739

1. Shintech employees and their designated representative must be made aware of their rights of access to relevant exposure to toxic substances or harmful physical agents and medical records, and provide representatives of the Assistant Secretary a right to access these records.

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- II. A copy of OSHA 29 CFR 1910.20 standard is to be made readily available to all employees in compliance with the Occupational Safety and Health act.

CONTRACTORS

Contractors working at the Shintech plant site will be responsible for their own "Hazardous Communications Program". Shintech will make contract employees aware of Shintech's program through posting on the appropriate bulletin boards and the "Contractor Safety Orientation".

Your Safety at Work

Your safety at work depends on four things:

1. Knowing what the hazards are
2. Knowing how to protect yourself
3. Thinking and acting safely

and... 4. Your co-workers

Safety Is Your Job

This book and your Hazcom training will help you with the first two—identifying hazards and protecting yourself. BUT—only you can take care of the third one—acting safely.

... And Your Co-workers' Job

Since your co-workers' unsafe behavior can endanger you, help them act safely, too.

MSDSs and Labels

This booklet explains the two key sources of information about chemical hazards—MSDSs and labels. The booklet is designed so that you can use it on the job—a handy, pocket-sized reference.

Fill in the Blanks

Use the blanks inside the front cover for emergency numbers. Keep them up-to-date. When you need them, you need them right away.

If You Don't Understand—ASK!

Important: If there's something you don't understand, get help from your supervisor.



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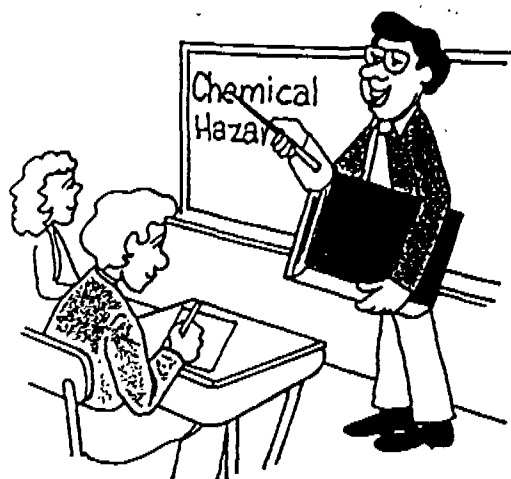
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All About Chemical Hazards

Chemicals are considered hazardous if they pose either *physical* or *health* hazards to workers exposed to them.

PHYSICAL HAZARDS include:

- Fire or explosions;
- Sudden release of pressure (for example, what happens when a tank of compressed gas is punctured); and
- Reactivity (if a chemical can burn, explode, or release dangerous gases after contact with water, air, or other chemicals).

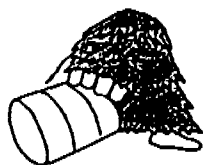
HEALTH HAZARDS are illnesses or other health problems that could develop as a result of exposure to a hazardous chemical. Health hazards could be as minor as a headache or mild skin irritation, or as major as cancer (or, in rare cases, death).

Typical Hazards

Materials can be hazardous if they are:

Corrosive—

can burn eyes or skin



Explosive—

violent expansion of gases



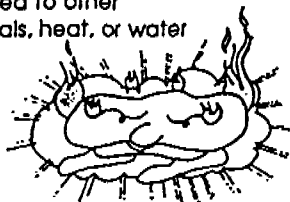
Flammable—

can catch fire easily



Reactive—

can burn, explode, or release toxic vapor if exposed to other chemicals, heat, or water



Radioactive—

emits harmful radiation



Toxic—

causes illness or sometimes death

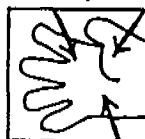


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How Chemicals Enter Your Body

There are three main routes of entry:



Skin and eye contact



Inhaling



Swallowing

Acute and Chronic Effects

Acute

effects are those that show up right away, such as burns or sudden illness.

Chronic

effects are those that usually take a long time to develop, such as cancer and other diseases, allergic reactions, or reproductive problems.



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Hazardous Chemicals List

Manufacturers and suppliers of chemicals will inform your employer of the hazards of those chemicals. All chemicals that are hazardous will have a label and an MSDS.

Your employer will include hazardous chemicals on your company's *hazardous chemicals list*. The list includes every hazardous chemical used in your plant.

This list is in the company's Hazcom program and may also be posted elsewhere. Are any chemicals in your work area included in the list? If so, write them on the lines below. And find out how to handle them safely!

[illegible]

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How to Read Labels

Manufacturers, importers, and distributors must label all containers of hazardous chemicals. Containers include items such as bags, barrels, bottles, boxes, cans, cylinders, drums, and storage tanks. The only exception to the labeling rule is pipes, although pipe labeling is required by some states.

Your employer has to check all containers when they arrive to make sure they're labeled. Just as important, those labels must stay on the containers and be readable as long as they're in use.

That's where you can help keep everyone safe. If you see a hazardous chemical container without a label, or with a label that's too torn or faded to read, tell your supervisor.

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How Labels Communicate

Labels come in many formats. Some labels use words to describe the hazards, and some use numbers and colors to help you quickly identify the kind and degree of hazard the chemical could present.

The labels on containers in your work area may look slightly different from the samples we'll describe here, but they should have the same basic information.

Always Read the Label First

Always read the label before you move, handle, or open a chemical container. It has a lot of valuable information and instructions.

A label tells you



The identity of the chemical—the common name, chemical name, or both. If the substance contains more than one chemical, they'll all be listed.



The name and address of the company that manufactured or imported the chemical.



The chemical's physical hazards. That's what could happen if you don't handle it properly. Is it flammable or combustible? Explosive? Is it reactive? Radioactive?



The chemical's health hazards. These are the possible health problems that could result from overexposure. Is it toxic? An irritant? Could it cause cancer?



Some labels also include important information such as storage and handling instructions. This could include information like "use only in well-ventilated areas," or "store in tightly closed containers."



Basic protective clothing, equipment, and procedures that should be used to work safely with the chemical might also be listed. Here, you might be told to "avoid contact with skin," or to use eye protection, etc.

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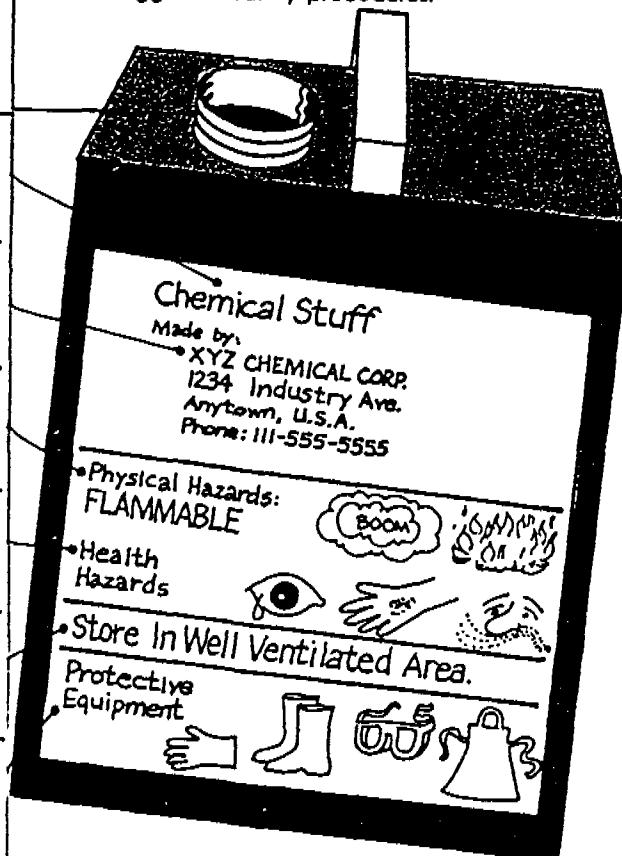
What's on the Label?

The label should always tell you:

- The identity of the chemical;
- The name and address of the company that made or imported the chemical;
- The chemical's physical hazards; and
- The chemical's health hazards.

The label *might* also include:

- Important instructions for storing or handling the chemical;
- Protective clothing and equipment you should use when working with the chemical; and
- Suggested safety procedures.



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COLOR/NUMBER LABELS

Two commonly used systems with numbers and colors on labels are the NFPA (National Fire Protection Association) system and the color-bar system.

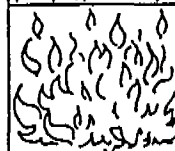
Colors Show Type of Hazard

In both systems, each color on the label stands for a different type of hazard:

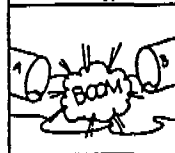
- BLUE = health hazard



- RED = fire hazard



- YELLOW = reactivity hazard



- WHITE = special hazard (NFPA) or protective equipment required (color bar)

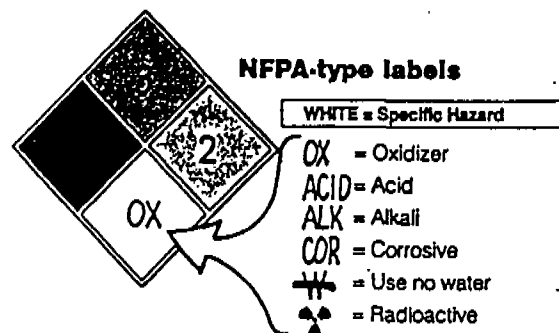
Numbers Show 'Degree of Hazard'

Both the NFPA and the color-bar systems also use numbers from "0" to "4" to show the degree of hazard in an uncontrolled situation.

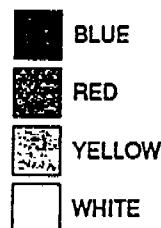
- 0 = Minimum hazard
- 1 = Slight hazard
- 2 = Moderate hazard
- 3 = Serious hazard
- 4 = Severe hazard

Example: A label with a 4 in its red section means a high degree of fire risk, if you don't handle the chemical correctly.

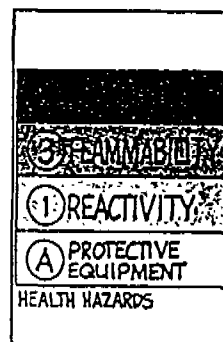
NFPA-type Labels



Label Colors



Color Bar-type Labels



Color bar-type labels

WHITE = Personal Protection

The letter that appears in the white bar is keyed to specific personal protective gear.

For example:

A =
 B =
 C =
 D-Z = etc.

Note: Reactivity numbers refer to the danger of reactivity with air or water.

Other Symbols and Labels

Other types of symbols may also be used on chemical labels to tell you additional information. For example, a respirator or other symbol might be shown to tell you what types of protective equipment to wear against that particular hazard.

You may see other types of labels on chemicals, too. For example, hazardous materials to be transported will have labels required by the Department of Transportation. Pesticides and consumer products also have special labels.

How to Stay Safe by Using Label Information

The label will often tell you how to store and handle the chemical, what protective clothing you should wear, and other safety procedures. Protect yourself by following these instructions. If there are no specific instructions, write down the name of the chemical and check the material safety data sheet for that substance. Sections VII and VIII on the back of the sheet will have instructions for safe handling and use of protective clothing.



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How to Read MSDSs

The Material Safety Data Sheet (MSDS) is often called the key to hazard communication. The MSDS is the one place where you can find all the important information on the chemical. (Labels—covered in the next chapter—contain a lot of useful information, but because of their small size they can't provide *all* the information you may need to stay safe.)

MSDSs do not *have* to follow any specific format. But they all *have* to provide the same kinds of information. OSHA's recommended MSDS format is most widely used and is the one we will use in this book. The MSDS is divided into eight sections.

If you come across technical terms (such as "vapor pressure") that you are not familiar with, consult the glossary at the end of this book.

Important: Always be sure that you are using the *latest* version of an MSDS.

Section II—Hazardous Ingredients/ Identity Information

Section II, Hazardous Ingredients/Identity Information, lists:

- Hazardous components of the chemical, including mixtures, by their scientific and common names.

- **Safe exposure limits** for workers will include OSHA's Permissible Exposure Limit (PEL). The American Conference of Governmental Industrial Hygienists' Threshold Limit Value® (TLV®) is another common limit listed.

- The only time you won't see the exact chemical components listed here is if the chemical is a manufacturer's "trade secret." The exposure limits and other hazard and safety information still have to be provided, though. And even trade secret identities must be given out in certain circumstances.

Section I — Hazardous Hydrocarbon/Amphiphilic Character		Section II — Physical/Chemical Characterizing	
Chemical Contaminants from Ground Water Study Center Records Agency: _____ Cont. Type: _____		Date Rec'd: _____ Date Rec'd: _____ Date Rec'd: _____ Date Rec'd: _____	
CAS Number: 6-1100-1-14 Weight: 1.000000 Vol: 10.0 (L) (111) (111) (111) (111) Other Hazardous Properties: 1.1 1.2 1.3 1.4 1.5 1.6		Date Rec'd: _____ Date Rec'd: _____ Date Rec'd: _____ Date Rec'd: _____	
Comments: 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4.9 5.0 5.1 5.2 5.3 5.4 5.5 5.6 5.7 5.8 5.9 6.0 6.1 6.2 6.3 6.4 6.5 6.6 6.7 6.8 6.9 7.0 7.1 7.2 7.3 7.4 7.5 7.6 7.7 7.8 7.9 8.0 8.1 8.2 8.3 8.4 8.5 8.6 8.7 8.8 8.9 9.0 9.1 9.2 9.3 9.4 9.5 9.6 9.7 9.8 9.9 10.0 10.1 10.2 10.3 10.4 10.5 10.6 10.7 10.8 10.9 11.0 11.1 11.2 11.3 11.4 11.5 11.6 11.7 11.8 11.9 12.0 12.1 12.2 12.3 12.4 12.5 12.6 12.7 12.8 12.9 13.0 13.1 13.2 13.3 13.4 13.5 13.6 13.7 13.8 13.9 14.0 14.1 14.2 14.3 14.4 14.5 14.6 14.7 14.8 14.9 15.0 15.1 15.2 15.3 15.4 15.5 15.6 15.7 15.8 15.9 16.0 16.1 16.2 16.3 16.4 16.5 16.6 16.7 16.8 16.9 17.0 17.1 17.2 17.3 17.4 17.5 17.6 17.7 17.8 17.9 18.0 18.1 18.2 18.3 18.4 18.5 18.6 18.7 18.8 18.9 19.0 19.1 19.2 19.3 19.4 19.5 19.6 19.7 19.8 19.9 20.0 20.1 20.2 20.3 20.4 20.5 20.6 20.7 20.8 20.9 21.0 21.1 21.2 21.3 21.4 21.5 21.6 21.7 21.8 21.9 22.0 22.1 22.2 22.3 22.4 22.5 22.6 22.7 22.8 22.9 23.0 23.1 23.2 23.3 23.4 23.5 23.6 23.7 23.8 23.9 24.0 24.1 24.2 24.3 24.4 24.5 24.6 24.7 24.8 24.9 25.0 25.1 25.2 25.3 25.4 25.5 25.6 25.7 25.8 25.9 26.0 26.1 26.2 26.3 26.4 26.5 26.6 26.7 26.8 26.9 27.0 27.1 27.2 27.3 27.4 27.5 27.6 27.7 27.8 27.9 28.0 28.1 28.2 28.3 28.4 28.5 28.6 28.7 28.8 28.9 29.0 29.1 29.2 29.3 29.4 29.5 29.6 29.7 29.8 29.9 30.0 30.1 30.2 30.3 30.4 30.5 30.6 30.7 30.8 30.9 31.0 31.1 31.2 31.3 31.4 31.5 31.6 31.7 31.8 31.9 32.0 32.1 32.2 32.3 32.4 32.5 32.6 32.7 32.8 32.9 33.0 33.1 33.2 33.3 33.4 33.5 33.6 33.7 33.8 33.9 34.0 34.1 34.2 34.3 34.4 34.5 34.6 34.7 34.8 34.9 35.0 35.1 35.2 35.3 35.4 35.5 35.6 35.7 35.8 35.9 36.0 36.1 36.2 36.3 36.4 36.5 36.6 36.7 36.8 36.9 37.0 37.1 37.2 37.3 37.4 37.5 37.6 37.7 37.8 37.9 38.0 38.1 38.2 38.3 38.4 38.5 38.6 38.7 38.8 38.9 39.0 39.1 39.2 39.3 39.4 39.5 39.6 39.7 39.8 39.9 40.0 40.1 40.2 40.3 40.4 40.5 40.6 40.7 40.8 40.9 41.0 41.1 41.2 41.3 41.4 41.5 41.6 41.7 41.8 41.9 42.0 42.1 42.2 42.3 42.4 42.5 42.6 42.7 42.8 42.9 43.0 43.1 43.2 43.3 43.4 43.5 43.6 43.7 43.8 43.9 44.0 44.1 44.2 44.3 44.4 44.5 44.6 44.7 44.8 44.9 45.0 45.1 45.2 45.3 45.4 45.5 45.6 45.7 45.8 45.9 46.0 46.1 46.2 46.3 46.4 46.5 46.6 46.7 46.8 46.9 47.0 47.1 47.2 47.3 47.4 47.5 47.6 47.7 47.8 47.9 48.0 48.1 48.2 48.3 48.4 48.5 48.6 48.7 48.8 48.9 49.0 49.1 49.2 49.3 49.4 49.5 49.6 49.7 49.8 49.9 50.0 50.1 50.2 50.3 50.4 50.5 50.6 50.7 50.8 50.9 51.0 51.1 51.2 51.3 51.4 51.5 51.6 51.7 51.8 51.9 52.0 52.1 52.2 52.3 52.4 52.5 52.6 52.7 52.8 52.9 53.0 53.1 53.2 53.3 53.4 53.5 53.6 53.7 53.8 53.9 54.0 54.1 54.2 54.3 54.4 54.5 54.6 54.7 54.8 54.9 55.0 55.1 55.2 55.3 55.4 55.5 55.6 55.7 55.8 55.9 56.0 56.1 56.2 56.3 56.4 56.5 56.6 56.7 56.8 56.9 57.0 57.1 57.2 57.3 57.4 57.5 57.6 57.7 57.8 57.9 58.0 58.1 58.2 58.3 58.4 58.5 58.6 58.7 58.8 58.9 59.0 59.1 59.2 59.3 59.4 59.5 59.6 59.7 59.8 59.9 60.0 60.1 60.2 60.3 60.4 60.5 60.6 60.7 60.8 60.9 61.0 61.1 61.2 61.3 61.4 61.5 61.6 61.7 61.8 61.9 62.0 62.1 62.2 62.3 62.4 62.5 62.6 62.7 62.8 62.9 63.0 63.1 63.2 63.3 63.4 63.5 63.6 63.7 63.8 63.9 64.0 64.1 64.2 64.3 64.4 64.5 64.6 64.7 64.8 64.9 65.0 65.1 65.2 65.3 65.4 65.5 65.6 65.7 65.8 65.9 66.0 66.1 66.2 66.3 66.4 66.5 66.6 66.7 66.8 66.9 67.0 67.1 67.2 67.3 67.4 67.5 67.6 67.7 67.8 67.9 68.0 68.1 68.2 68.3 68.4 68.5 68.6 68.7 68.8 68.9 69.0 69.1 69.2 69.3 69.4 69.5 69.6 69.7 69.8 69.9 70.0 70.1 70.2 70.3 70.4 70.5 70.6 70.7 70.8 70.9 71.0 71.1 71.2 71.3 71.4 71.5 71.6 71.7 71.8 71.9 72.0 72.1 72.2 72.3 72.4 72.5 72.6 72.7 72.8 72.9 73.0 73.1 73.2 73.3 73.4 73.5 73.6 73.7 73.8 73.9 74.0 74.1 74.2 74.3 74.4 74.5 74.6 74.7 74.8 74.9 75.0 75.1 75.2 75.3 75.4 75.5 75.6 75.7 75.8 75.9 76.0 76.1 76.2 76.3 76.4 76.5 76.6 76.7 76.8 76.9 77.0 77.1 77.2 77.3 77.4 77.5 77.			

Section III—Physical/Chemical Characteristics

Section III, *Physical/Chemical Characteristics*, may look very scientific, but the information in the section is actually very basic and important. It tells you what conditions will change the chemical's form, which could affect the type and degree of the chemical's hazard.

Example: A chemical with a very high vapor pressure probably needs to be treated differently than one with a low vapor pressure. A high vapor pressure, which means the chemical evaporates quickly, will require better ventilation, and possibly a respirator and other protective measures.

Here's what you'll find in Section III (consult the glossary for definitions of these terms):

- Boiling point and melting point;
- Vapor pressure, vapor density, and evaporation rate; and
- Solubility in water and specific gravity.

This section also tells you how the chemical *should* look and smell under normal conditions.

Section III - Physical/Chemical Characteristics			
Boiling Point	210 - 215 °C	Melting Point	2.77
Vapor Pressure (mm Hg)	2.5 mm Hg	Vapor Density	3.5
Evaporation Rate	1	Specific Gravity	1.1
Solubility in water			
Insoluble in water			
Section IV - Fire and Explosion Hazard Data			
Flash Point (°C)			
Flammable Limits			
Explosion Limits			
Section V - Toxicological Information			
Acute Toxicity			
Chronic Toxicity			
Environmental Data			

Section IV—Fire and Explosion Hazard Data

Section IV of the MSDS, *Fire and Explosion Hazard Data*, is just what it sounds like. This extremely important section tells you:

- The chemical's flash point and its
- Flammable or explosion limits.

This section also tells you what to use to put out a fire started by the chemical, as well as any special hazards or firefighting procedures to be aware of.

Section IV - Fire and Explosion Hazard Data	
Flash Point (°C)	210 - 215 °C
Flammable Limits	2.5 - 15.0 %
Explosion Limits	1.1 - 3.5 %
Section V - Toxicological Information	
Acute Toxicity	
Chronic Toxicity	
Environmental Data	

Section V—Reactivity Data

Section V, *Reactivity Data*, shows whether you need to be concerned about what *could* happen (the reaction) if the chemical is mixed with air, water, or other chemicals. It also explains what conditions and chemicals to keep it away from.

[illegible]

Section VI—Health Hazard Data

Section VI, *Health Hazard Data*, delivers critical information to help keep you safe. It begins by telling you how the chemical could get into your body:

- Inhaling; and/or
- Swallowing; and/or
- Through the skin.

Then it tells you what health hazards *could* result from exposure to the chemical. These health hazards could be either:

- **Acute**, showing up right after exposure
- **Chronic**, taking a long time to show up.

There's also space in this section for symptoms of exposure, like headache or skin rash. The MSDS also tells you whether the chemical might aggravate an existing medical condition, such as breathing or heart problems. If the chemical is believed to be *carcinogenic* (cancer-causing), that's here, too.

The final part of the health hazards section is emergency and first-aid procedures to follow for accidental exposure to the chemical. You should always be familiar with this information, in case something goes wrong.

Section V -- Employment Data			
1. Name of Employer	2. Address	3. City	4. State
5. Telephone	6. Date of Hire	7. Date of Discharge	8. Date of Death
9. Nature of Work and Position Held 10. Description of Job and Duties 11. Description of Job and Duties 12. Description of Job and Duties			
13. Supervisor	14. Job Title	15. Job Title	16. Job Title
17. Job Title	18. Job Title	19. Job Title	20. Job Title
Section VI -- Health Hazard Data			
21. Name of Employer	22. Address	23. City	24. State
25. Telephone	26. Date of Hire	27. Date of Discharge	28. Date of Death
29. Nature of Work and Position Held 30. Description of Job and Duties 31. Description of Job and Duties 32. Description of Job and Duties			
33. Supervisor	34. Job Title	35. Job Title	36. Job Title
37. Job Title	38. Job Title	39. Job Title	40. Job Title
Section VII -- Health Hazard Data			
41. Name of Employer	42. Address	43. City	44. State
45. Telephone	46. Date of Hire	47. Date of Discharge	48. Date of Death
49. Nature of Work and Position Held 50. Description of Job and Duties 51. Description of Job and Duties 52. Description of Job and Duties			
53. Supervisor	54. Job Title	55. Job Title	56. Job Title
57. Job Title	58. Job Title	59. Job Title	60. Job Title

Section VII—Precautions for Safe Handling and Use

In Section VII, *Precautions for Safe Handling and Use*, you'll find instructions for the correct way to handle, store, and dispose of the chemical. There's also information on what to do if the chemical spills, leaks, or is released into the air. Naturally, you need to know this information before you start the job!

Your company may have a standard procedure for handling the chemical, which takes into consideration the chemical's use at your workplace. Know your company's procedures and follow them.

Section VII - Precautions for Safe Handling and Use	
Precautionary Statements	1. Avoid contact with skin and eyes. 2. Avoid contact with clothing. 3. Avoid contact with food and drink. 4. Avoid contact with water. 5. Avoid contact with surfaces. 6. Avoid contact with equipment. 7. Avoid contact with electrical equipment. 8. Avoid contact with fire. 9. Avoid contact with heat. 10. Avoid contact with sunlight. 11. Avoid contact with moisture. 12. Avoid contact with air. 13. Avoid contact with dust. 14. Avoid contact with fumes. 15. Avoid contact with vapors. 16. Avoid contact with smoke. 17. Avoid contact with steam. 18. Avoid contact with acid. 19. Avoid contact with alkali. 20. Avoid contact with oxidizing agents. 21. Avoid contact with reducing agents. 22. Avoid contact with corrosive agents. 23. Avoid contact with toxic agents. 24. Avoid contact with flammable agents. 25. Avoid contact with explosive agents. 26. Avoid contact with radioactive agents. 27. Avoid contact with carcinogenic agents. 28. Avoid contact with mutagenic agents. 29. Avoid contact with teratogenic agents. 30. Avoid contact with reproductive toxic agents. 31. Avoid contact with developmental toxic agents. 32. Avoid contact with immunotoxic agents. 33. Avoid contact with neurotoxic agents. 34. Avoid contact with hepatotoxic agents. 35. Avoid contact with nephrotoxic agents. 36. Avoid contact with cardiotoxic agents. 37. Avoid contact with hematotoxic agents. 38. Avoid contact with immunosuppressive agents. 39. Avoid contact with immunostimulating agents. 40. Avoid contact with immunomodulating agents. 41. Avoid contact with immunosensitizing agents. 42. Avoid contact with immunosuppressing agents. 43. Avoid contact with immunoenhancing agents. 44. Avoid contact with immunoinhibiting agents. 45. Avoid contact with immunoprotective agents. 46. Avoid contact with immunoregulatory agents. 47. Avoid contact with immunomodulatory agents. 48. Avoid contact with immunosuppressive agents. 49. Avoid contact with immunostimulating agents. 50. Avoid contact with immunomodulating agents.
Precautionary Statements	1. Avoid contact with skin and eyes. 2. Avoid contact with clothing. 3. Avoid contact with food and drink. 4. Avoid contact with water. 5. Avoid contact with surfaces. 6. Avoid contact with equipment. 7. Avoid contact with electrical equipment. 8. Avoid contact with fire. 9. Avoid contact with heat. 10. Avoid contact with sunlight. 11. Avoid contact with moisture. 12. Avoid contact with air. 13. Avoid contact with dust. 14. Avoid contact with fumes. 15. Avoid contact with vapors. 16. Avoid contact with smoke. 17. Avoid contact with steam. 18. Avoid contact with acid. 19. Avoid contact with alkali. 20. Avoid contact with oxidizing agents. 21. Avoid contact with reducing agents. 22. Avoid contact with corrosive agents. 23. Avoid contact with toxic agents. 24. Avoid contact with flammable agents. 25. Avoid contact with explosive agents. 26. Avoid contact with radioactive agents. 27. Avoid contact with carcinogenic agents. 28. Avoid contact with mutagenic agents. 29. Avoid contact with teratogenic agents. 30. Avoid contact with reproductive toxic agents. 31. Avoid contact with developmental toxic agents. 32. Avoid contact with immunotoxic agents. 33. Avoid contact with neurotoxic agents. 34. Avoid contact with hepatotoxic agents. 35. Avoid contact with nephrotoxic agents. 36. Avoid contact with cardiotoxic agents. 37. Avoid contact with hematotoxic agents. 38. Avoid contact with immunosuppressive agents. 39. Avoid contact with immunostimulating agents. 40. Avoid contact with immunomodulating agents. 41. Avoid contact with immunosensitizing agents. 42. Avoid contact with immunosuppressing agents. 43. Avoid contact with immunoenhancing agents. 44. Avoid contact with immunoinhibiting agents. 45. Avoid contact with immunoprotective agents. 46. Avoid contact with immunoregulatory agents. 47. Avoid contact with immunomodulatory agents. 48. Avoid contact with immunosuppressive agents. 49. Avoid contact with immunostimulating agents. 50. Avoid contact with immunomodulating agents.

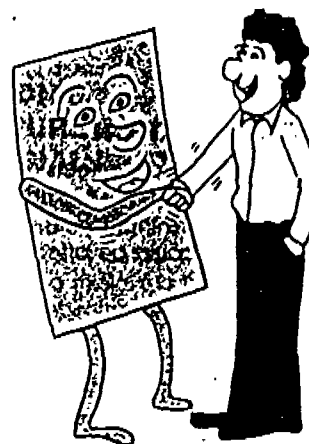
Section VIII—Control Measures

The final section, Section VIII, is *Control Measures*. This is where you'll find out what type of protective clothing and equipment to use when working with the chemical. You'll also see what type of ventilation is called for and what work and hygiene practices—such as washing your hands after working with the chemical—you need to follow to prevent accidental exposure.

Again, your company may have procedures different from those listed in the material safety data sheet. If you're not sure what to do, ask your supervisor.

Section VIII - Control Measures	
Control Measures	1. Use appropriate personal protective equipment (PPE) for the chemical. 2. Use appropriate engineering controls for the chemical. 3. Use appropriate administrative controls for the chemical. 4. Use appropriate hygiene practices for the chemical. 5. Use appropriate work practices for the chemical. 6. Use appropriate storage practices for the chemical. 7. Use appropriate disposal practices for the chemical. 8. Use appropriate emergency response procedures for the chemical. 9. Use appropriate first aid procedures for the chemical. 10. Use appropriate medical surveillance procedures for the chemical. 11. Use appropriate training procedures for the chemical. 12. Use appropriate labeling procedures for the chemical. 13. Use appropriate safety data sheet procedures for the chemical. 14. Use appropriate hazard communication procedures for the chemical. 15. Use appropriate risk assessment procedures for the chemical. 16. Use appropriate safety management procedures for the chemical. 17. Use appropriate safety culture procedures for the chemical. 18. Use appropriate safety training procedures for the chemical. 19. Use appropriate safety communication procedures for the chemical. 20. Use appropriate safety documentation procedures for the chemical. 21. Use appropriate safety monitoring procedures for the chemical. 22. Use appropriate safety evaluation procedures for the chemical. 23. Use appropriate safety improvement procedures for the chemical. 24. Use appropriate safety review procedures for the chemical. 25. Use appropriate safety audit procedures for the chemical. 26. Use appropriate safety assessment procedures for the chemical. 27. Use appropriate safety analysis procedures for the chemical. 28. Use appropriate safety investigation procedures for the chemical. 29. Use appropriate safety reporting procedures for the chemical. 30. Use appropriate safety notification procedures for the chemical. 31. Use appropriate safety consultation procedures for the chemical. 32. Use appropriate safety cooperation procedures for the chemical. 33. Use appropriate safety coordination procedures for the chemical. 34. Use appropriate safety collaboration procedures for the chemical. 35. Use appropriate safety partnership procedures for the chemical. 36. Use appropriate safety integration procedures for the chemical. 37. Use appropriate safety alignment procedures for the chemical. 38. Use appropriate safety commitment procedures for the chemical. 39. Use appropriate safety accountability procedures for the chemical. 40. Use appropriate safety responsibility procedures for the chemical. 41. Use appropriate safety authority procedures for the chemical. 42. Use appropriate safety empowerment procedures for the chemical. 43. Use appropriate safety enablement procedures for the chemical. 44. Use appropriate safety encouragement procedures for the chemical. 45. Use appropriate safety reinforcement procedures for the chemical. 46. Use appropriate safety recognition procedures for the chemical. 47. Use appropriate safety reward procedures for the chemical. 48. Use appropriate safety promotion procedures for the chemical. 49. Use appropriate safety advancement procedures for the chemical. 50. Use appropriate safety development procedures for the chemical.
Control Measures	1. Use appropriate personal protective equipment (PPE) for the chemical. 2. Use appropriate engineering controls for the chemical. 3. Use appropriate administrative controls for the chemical. 4. Use appropriate hygiene practices for the chemical. 5. Use appropriate work practices for the chemical. 6. Use appropriate storage practices for the chemical. 7. Use appropriate disposal practices for the chemical. 8. Use appropriate emergency response procedures for the chemical. 9. Use appropriate first aid procedures for the chemical. 10. Use appropriate medical surveillance procedures for the chemical. 11. Use appropriate training procedures for the chemical. 12. Use appropriate labeling procedures for the chemical. 13. Use appropriate safety data sheet procedures for the chemical. 14. Use appropriate hazard communication procedures for the chemical. 15. Use appropriate risk assessment procedures for the chemical. 16. Use appropriate safety management procedures for the chemical. 17. Use appropriate safety culture procedures for the chemical. 18. Use appropriate safety training procedures for the chemical. 19. Use appropriate safety communication procedures for the chemical. 20. Use appropriate safety documentation procedures for the chemical. 21. Use appropriate safety monitoring procedures for the chemical. 22. Use appropriate safety evaluation procedures for the chemical. 23. Use appropriate safety improvement procedures for the chemical. 24. Use appropriate safety review procedures for the chemical. 25. Use appropriate safety audit procedures for the chemical. 26. Use appropriate safety assessment procedures for the chemical. 27. Use appropriate safety analysis procedures for the chemical. 28. Use appropriate safety investigation procedures for the chemical. 29. Use appropriate safety reporting procedures for the chemical. 30. Use appropriate safety notification procedures for the chemical. 31. Use appropriate safety consultation procedures for the chemical. 32. Use appropriate safety cooperation procedures for the chemical. 33. Use appropriate safety coordination procedures for the chemical. 34. Use appropriate safety collaboration procedures for the chemical. 35. Use appropriate safety partnership procedures for the chemical. 36. Use appropriate safety integration procedures for the chemical. 37. Use appropriate safety alignment procedures for the chemical. 38. Use appropriate safety commitment procedures for the chemical. 39. Use appropriate safety accountability procedures for the chemical. 40. Use appropriate safety responsibility procedures for the chemical. 41. Use appropriate safety authority procedures for the chemical. 42. Use appropriate safety empowerment procedures for the chemical. 43. Use appropriate safety enablement procedures for the chemical. 44. Use appropriate safety encouragement procedures for the chemical. 45. Use appropriate safety reinforcement procedures for the chemical. 46. Use appropriate safety recognition procedures for the chemical. 47. Use appropriate safety reward procedures for the chemical. 48. Use appropriate safety promotion procedures for the chemical. 49. Use appropriate safety advancement procedures for the chemical. 50. Use appropriate safety development procedures for the chemical.

4



A New MSDS

The American National Standards Institute (ANSI) has developed a new format for preparation of MSDSs. The new format makes it easier for you to find—and use—the information you need to work safely.

Here are the sections of the new MSDS format.

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

The new MSDS begins with the chemical's name—on its label plus the name, address, and phone number of the company that makes or distributes the chemical.

SECTION 2. COMPOSITION, INFORMATION ON INGREDIENTS

This section lists any ingredients that OSHA has identified as hazardous. The section may also list other key ingredients.

This section may also include the chemical's safe exposure limits:

- PEL (legal Permissible Exposure Limit set by OSHA)
- TLV (Threshold Limit Value) recommended by the American Conference of Governmental Industrial Hygienists.

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**Subpart Z—Toxic and Hazardous Substances Hazard Communication
Standard**

HISTORY/AUTHORITY of 29 CFR 1910 Subpart Z

EXPLANATION of 29 CFR 1910 Subpart Z

29cfr1910.1200 Hazard communication.

EXPLANATION of 29CFR1910.1200

[1910.1200 revised by 59 FR 6169, February 9, 1994]

29cfr1910.1200(a)

EXPLANATION of 29CFR1910.1200(a)

Purpose.

29cfr1910.1200(a)(1)

EXPLANATION of 29CFR1910.1200(a)(1)

The purpose of this section is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training.

29cfr1910.1200(a)(2)

EXPLANATION of 29CFR1910.1200(a)(2)

This occupational safety and health standard is intended to address comprehensively the issue of evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, and to preempt any legal requirements of a state, or

political subdivision of a state, pertaining to this subject. Evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, may include, for example, but is not limited to, provisions for: developing and maintaining a written hazard communication program for the workplace, including lists of hazardous chemicals present; labeling of containers of chemicals in the workplace, as well as of containers of chemicals being shipped to other workplaces; preparation and distribution of material safety data sheets to employees and downstream employers; and development and implementation of employee training programs regarding hazards of chemicals and protective measures. Under section 18 of the Act, no state or political subdivision of a state may adopt or enforce, through any court or agency, any requirement relating to the issue addressed by this Federal standard, except pursuant to a Federally-approved state plan.

29cfr1910.1200(b)

EXPLANATION of 29CFR1910.1200(b)

Scope and application.

29cfr1910.1200(b)(1)

EXPLANATION of 29CFR1910.1200(b)(1)

This section requires chemical manufacturers or importers to assess 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 communication program, labels and other forms of warning, material safety data sheets, 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. Appendix E of this section is a general guide for such employers to help them determine their compliance obligations under the rule.)

29cfr1910.1200(b)(2)

EXPLANATION of 29CFR1910.1200(b)(2)

This section applies to any chemical which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

29cfr1910.1200(b)(3)

EXPLANATION of 29CFR1910.1200(b)(3)

This section applies to laboratories only as follows:

29cfr1910.1200(b)(3)(i)

EXPLANATION of 29CFR1910.1200(b)(3)(i)

Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

29cfr1910.1200(b)(3)(ii)

EXPLANATION of 29CFR1910.1200(b)(3)(ii)

Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible during each workshift to laboratory employees when they are in their work areas;

29cfr1910.1200(b)(3)(iii)

EXPLANATION of 29CFR1910.1200(b)(3)(iii)

Employers shall ensure that laboratory employees are provided information and training in accordance with paragraph (h) of this section, except for the location and availability of the written hazard communication program under paragraph (h)(2)(iii) of this section; and,

29cfr1910.1200(b)(3)(iv)

EXPLANATION of 29CFR1910.1200(b)(3)(iv)

Laboratory employers that ship hazardous chemicals are considered to be either a chemical manufacturer or a distributor under this rule, and thus must ensure that

any containers of hazardous chemicals leaving the laboratory are labeled in accordance with paragraph (f)(1) of this section, and that a material safety data sheet is provided to distributors and other employers in accordance with paragraphs (g)(6) and (g)(7) of this section.

29cfr1910.1200(b)(4)

EXPLANATION of 29CFR1910.1200(b)(4)

In work operations where employees only handle chemicals in sealed containers which are not opened under normal conditions of use (such as are found in marine cargo handling, warehousing, or retail sales), this section applies to these operations only as follows:

29cfr1910.1200(b)(4)(i)

EXPLANATION of 29CFR1910.1200(b)(4)(i)

Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

29cfr1910.1200(b)(4)(ii)

EXPLANATION of 29CFR1910.1200(b)(4)(ii)

Employers shall maintain copies of any material safety data sheets that are received with incoming shipments of the sealed containers of hazardous chemicals, shall obtain a material safety data sheet as soon as possible for sealed containers of hazardous chemicals received without a material safety data sheet if an employee requests the material safety data sheet, and shall ensure that the material safety data sheets are readily accessible during each work shift to employees when they are in their work area(s); and,

29cfr1910.1200(b)(4)(iii)

EXPLANATION of 29CFR1910.1200(b)(4)(iii)

Employers shall ensure that employees are provided with information and training in accordance with paragraph (h) of this section (except for the location and availability of the written hazard communication program under paragraph

(h)(2)(iii) of this section), to the extent necessary to protect them in the event of a spill or leak of a hazardous chemical from a sealed container.

29cfr1910.1200(b)(5)

EXPLANATION of 29CFR1910.1200(b)(5)

This section does not require labeling of the following chemicals:

29cfr1910.1200(b)(5)(i)

EXPLANATION of 29CFR1910.1200(b)(5)(i)

Any pesticide as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 *et seq.*), when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

29cfr1910.1200(b)(5)(ii)

EXPLANATION of 29CFR1910.1200(b)(5)(ii)

Any chemical substance or mixture as such terms are defined in the Toxic Substances Control Act (15 U.S.C. 2601 *et seq.*), when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

29cfr1910.1200(b)(5)(iii)

EXPLANATION of 29CFR1910.1200(b)(5)(iii)

Any food, food additive, color additive, drug, cosmetic, or medical or veterinary device or product, including materials intended for use as ingredients in such products (e.g. flavors and fragrances), as such terms are defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 *et seq.*) or the Virus-Serum-Toxin Act of 1913 (21 U.S.C. 151 *et seq.*), and regulations issued under those Acts, when they are subject to the labeling requirements under those Acts by either the Food and Drug Administration or the Department of Agriculture;

29cfr1910.1200(b)(5)(iv)

EXPLANATION of 29CFR1910.1200(b)(5)(iv)

Any distilled spirits (beverage alcohols), wine, or malt beverage intended for nonindustrial use, as such terms are defined in the Federal Alcohol Administration Act (27 U.S.C. 201 *et seq.*) and regulations issued under that Act, when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Bureau of Alcohol, Tobacco, and Firearms;

29cfr1910.1200(b)(5)(v)

EXPLANATION of 29CFR1910.1200(b)(5)(v)

Any consumer product or hazardous substance as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 *et seq.*) and Federal Hazardous Substances Act (15 U.S.C. 1261 *et seq.*) respectively, when subject to a consumer product safety standard or labeling requirement of those Acts, or regulations issued under those Acts by the Consumer Product Safety Commission; and,

29cfr1910.1200(b)(5)(vi)

EXPLANATION of 29CFR1910.1200(b)(5)(vi)

Agricultural or vegetable seed treated with pesticides and labeled in accordance with the Federal Seed Act (7 U.S.C. 1551 *et seq.*) and the labeling regulations issued under that Act by the Department of Agriculture.

29cfr1910.1200(b)(6)

EXPLANATION of 29CFR1910.1200(b)(6)

This section does not apply to:

29cfr1910.1200(b)(6)(i)

EXPLANATION of 29CFR1910.1200(b)(6)(i)

Any hazardous waste as such term is defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6901 *et seq.*), when subject to regulations issued under that Act by the Environmental Protection Agency;

29cfr1910.1200(b)(6)(ii)

EXPLANATION of 29CFR1910.1200(b)(6)(ii)

Any hazardous substance as such term is defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)(42 U.S.C. 9601 *et seq.*), when subject to regulations issued under that Act by the Environmental Protection Agency;

29cfr1910.1200(b)(6)(iii)

EXPLANATION of 29CFR1910.1200(b)(6)(iii)

Tobacco or tobacco products;

29cfr1910.1200(b)(6)(iv)

EXPLANATION of 29CFR1910.1200(b)(6)(iv)

Wood or wood products, including lumber which will not be processed, where the chemical manufacturer or importer can establish that the only hazard they pose to employees is the potential for flammability or combustibility (wood or wood products which have been treated with a hazardous chemical covered by this standard, and wood which may be subsequently sawed or cut, generating dust, are not exempted);

29cfr1910.1200(b)(6)(v)

EXPLANATION of 29CFR1910.1200(b)(6)(v)

Articles (as that term is defined in paragraph (c) of this section);

29cfr1910.1200(b)(6)(vi)

EXPLANATION of 29CFR1910.1200(b)(6)(vi)

Food or alcoholic beverages which are sold, used, or prepared in a retail establishment (such as a grocery store, restaurant, or drinking place), and foods intended for personal consumption by employees while in the workplace;

29cfr1910.1200(b)(6)(vii)

SHINTECH-000759

EXPLANATION of 29CFR1910.1200(b)(6)(vii)

Any drug, as that term is defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 *et seq.*), when it is in solid, final form for direct administration to the patient (*e.g.*, tablets or pills); drugs which are packaged by the chemical manufacturer for sale to consumers in a retail establishment (*e.g.*, over-the-counter drugs); and drugs intended for personal consumption by employees while in the workplace (*e.g.*, first aid supplies);

29cfr1910.1200(b)(6)(viii)

EXPLANATION of 29CFR1910.1200(b)(6)(viii)

Cosmetics which are packaged for sale to consumers in a retail establishment, and cosmetics intended for personal consumption by employees while in the workplace;

29cfr1910.1200(b)(6)(ix)

EXPLANATION of 29CFR1910.1200(b)(6)(ix)

Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 *et seq.*) and Federal Hazardous Substances Act (15 U.S.C. 1261 *et seq.*) respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended;

29cfr1910.1200(b)(6)(x)

EXPLANATION of 29CFR1910.1200(b)(6)(x)

Nuisance particulates where the chemical manufacturer or importer can establish that they do not pose any physical or health hazard covered under this section;

29cfr1910.1200(b)(6)(xi)

EXPLANATION of 29CFR1910.1200(b)(6)(xi)

Ionizing and nonionizing radiation; and,

29cfr1910.1200(b)(6)(xii)

EXPLANATION of 29CFR1910.1200(b)(6)(xii)

Biological hazards.

29cfr1910.1200(c)

EXPLANATION of 29CFR1910.1200(c)

Definitions.

Article means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, *e.g.*, minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

Assistant Secretary means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

Chemical means any element, chemical compound or mixture of elements and/or compounds.

Chemical manufacturer means an employer with a workplace where chemical(s) are produced for use or distribution.

Chemical name means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

Combustible liquid means 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.

SHINTECH-000761

Commercial account means an arrangement whereby a retail distributor sells hazardous chemicals to an employer, generally in large quantities over time and/or at costs that are below the regular retail price.

Common name means any designation or identification such as code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name.

Compressed gas means:

- (i) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 °F (21.1 °C); or
- (ii) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 °F (54.4 °C) regardless of the pressure at 70 °F (21.1 °C); or
- (iii) A liquid having a vapor pressure exceeding 40 psi at 100 °F (37.8 °C) as determined by ASTM D-323-72.

Container means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.

Designated representative means any individual or organization to whom an employee gives written authorization to exercise such employee's rights under this section. A recognized or certified collective bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

Director means the Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.

Distributor means a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

Employee means a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers such as office workers or bank tellers who encounter hazardous chemicals only in non-routine,

isolated instances are not covered.

Employer means a person engaged in a business where chemicals are either used, distributed, or are produced for use or distribution, including a contractor or subcontractor.

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

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).

Flammable means a chemical that falls into one of the following categories:

(i) *Aerosol, flammable* means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;

(ii) *Gas, flammable* means:

(A) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen (13) percent by volume or less; or

(B) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve (12) percent by volume, regardless of the lower limit;

(iii) *Liquid, flammable* means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints 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.

(iv) *Solid, flammable* means a solid, other than a blasting agent or explosive as defined in §1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or

processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

Flashpoint means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(i) Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)) for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

(ii) Pensky-Martens Closed Tester (see American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)) for liquids with a viscosity equal to or greater than 45 SUS at 100°F (37.8°C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

(iii) Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)).

Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

Foreseeable emergency means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

Hazardous chemical means any chemical which is a physical hazard or a health hazard.

Hazard warning means any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the specific physical or health hazard(s), including target organ effects, of the chemical(s) in the container(s). (See the definitions for "physical hazard" and

"health hazard" to determine the hazards which must be covered.)

Health hazard means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A provides further definitions and explanations of the scope of health hazards covered by this section, and Appendix B describes the criteria to be used to determine whether or not a chemical is to be considered hazardous for purposes of this standard.

Identity means any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS.

Immediate use means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

Importer means the first business with employees within the Customs Territory of the United States which receives hazardous chemicals produced in other countries for the purpose of supplying them to distributors or employers within the United States.

Label means any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

Material safety data sheet (MSDS) means written or printed material concerning a hazardous chemical which is prepared in accordance with paragraph (g) of this section.

Mixture means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

Organic peroxide means an organic compound that contains the bivalent -O-O-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

Oxidizer means a chemical other than a blasting agent or explosive as defined in §1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

Physical hazard means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

Produce means to manufacture, process, formulate, blend, extract, generate, emit, or repackage.

Pyrophoric means a chemical that will ignite spontaneously in air at a temperature of 130°F (54.4°C) or below.

Responsible party means someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

Specific chemical identity means the chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.

Trade secret means any confidential formula, pattern, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. Appendix D sets out the criteria to be used in evaluating trade secrets.

Unstable (reactive) means a chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

Use means to package, handle, react, emit, extract, generate as a byproduct, or transfer.

Water-reactive means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

Work area means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

Workplace means an establishment, job site, or project, at one geographical location containing one or more work areas.

29cfr1910.1200(d)

EXPLANATION of 29CFR1910.1200(d)

Hazard determination.

29cfr1910.1200(d)(1)

EXPLANATION of 29CFR1910.1200(d)(1)

Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to determine if they are hazardous. Employers are not required to evaluate chemicals unless they choose not to rely on the evaluation performed by the chemical manufacturer or importer for the chemical to satisfy this requirement.

29cfr1910.1200(d)(2)

EXPLANATION of 29CFR1910.1200(d)(2)

Chemical manufacturers, importers or employers evaluating chemicals shall identify and consider the available scientific evidence concerning such hazards. For health hazards, evidence which is statistically significant and which is based on at least one positive study conducted in accordance with established scientific principles is considered to be sufficient to establish a hazardous effect if the results of the study meet the definitions of health hazards in this section. Appendix A shall be consulted for the scope of health hazards covered, and Appendix B shall be consulted for the criteria to be followed with respect to the completeness of the evaluation, and the data to be reported.

29cfr1910.1200(d)(3)

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EXPLANATION of 29CFR1910.1200(d)(3)

The chemical manufacturer, importer or employer evaluating chemicals shall treat the following sources as establishing that the chemicals listed in them are hazardous:

29cfr1910.1200(d)(3)(i)

EXPLANATION of 29CFR1910.1200(d)(3)(i)

29 CFR part 1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA); or,

29cfr1910.1200(d)(3)(ii)

EXPLANATION of 29CFR1910.1200(d)(3)(ii)

Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment, American Conference of Governmental Industrial Hygienists (ACGIH) (latest edition). The chemical manufacturer, importer, or employer is still responsible for evaluating the hazards associated with the chemicals in these source lists in accordance with the requirements of this standard.

29cfr1910.1200(d)(4)

EXPLANATION of 29CFR1910.1200(d)(4)

Chemical manufacturers, importers and employers evaluating chemicals shall treat the following sources as establishing that a chemical is a carcinogen or potential carcinogen for hazard communication purposes:

29cfr1910.1200(d)(4)(i)

EXPLANATION of 29CFR1910.1200(d)(4)(i)

National Toxicology Program (NTP), *Annual Report on Carcinogens* (latest edition);

29cfr1910.1200(d)(4)(ii)

EXPLANATION of 29CFR1910.1200(d)(4)(ii)

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International Agency for Research on Cancer (IARC) *Monographs* (latest editions); or

29cfr1910.1200(d)(4)(iii)

EXPLANATION of 29CFR1910.1200(d)(4)(iii)

29 CFR part 1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

Note: The *Registry of Toxic Effects of Chemical Substances* published by the National Institute for Occupational Safety and Health indicates whether a chemical has been found by NTP or IARC to be a potential carcinogen.

29cfr1910.1200(d)(5)

EXPLANATION of 29CFR1910.1200(d)(5)

The chemical manufacturer, importer or employer shall determine the hazards of mixtures of chemicals as follows:

29cfr1910.1200(d)(5)(i)

EXPLANATION of 29CFR1910.1200(d)(5)(i)

If a mixture has been tested as a whole to determine its hazards, the results of such testing shall be used to determine whether the mixture is hazardous;

29cfr1910.1200(d)(5)(ii)

EXPLANATION of 29CFR1910.1200(d)(5)(ii)

If a mixture has not been tested as a whole to determine whether the mixture is a health hazard, the mixture shall be assumed to present the same health hazards as do the components which comprise one percent (by weight or volume) or greater of the mixture, except that the mixture shall be assumed to present a carcinogenic hazard if it contains a component in concentrations of 0.1 percent or greater which is considered to be a carcinogen under paragraph (d)(4) of this section;

29cfr1910.1200(d)(5)(iii)

EXPLANATION of 29CFR1910.1200(d)(5)(iii)

If a mixture has not been tested as a whole to determine whether the mixture is a physical hazard, the chemical manufacturer, importer, or employer may use whatever scientifically valid data is available to evaluate the physical hazard potential of the mixture; and,

29cfr1910.1200(d)(5)(iv)

EXPLANATION of 29CFR1910.1200(d)(5)(iv)

If the chemical manufacturer, importer, or employer has evidence to indicate that a component present in the mixture in concentrations of less than one percent (or in the case of carcinogens, less than 0.1 percent) could be released in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees in those concentrations, the mixture shall be assumed to present the same hazard.

29cfr1910.1200(d)(6)

EXPLANATION of 29CFR1910.1200(d)(6)

Chemical manufacturers, importers, or employers evaluating chemicals shall describe in writing the procedures they use to determine the hazards of the chemical they evaluate. The written procedures are to be made available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director. The written description may be incorporated into the written hazard communication program required under paragraph (e) of this section.

29cfr1910.1200(e)

EXPLANATION of 29CFR1910.1200(e)

Written hazard communication program.

29cfr1910.1200(e)(1)

EXPLANATION of 29CFR1910.1200(e)(1)

Employers shall develop, implement, and maintain at each workplace, a written

hazard communication program which at least describes how the criteria specified in paragraphs (f), (g), and (h) of this section for labels and other forms of warning, material safety data sheets, and employee information and training will be met, and which also includes the following:

29cfr1910.1200(e)(1)(i)

EXPLANATION of 29CFR1910.1200(e)(1)(i)

A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate material safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas); and,

29cfr1910.1200(e)(1)(ii)

EXPLANATION of 29CFR1910.1200(e)(1)(ii)

The methods the employer will use to inform employees of the hazards of non-routine tasks (for example, the cleaning of reactor vessels), and the hazards associated with chemicals contained in unlabeled pipes in their work areas.

29cfr1910.1200(e)(2)

EXPLANATION of 29CFR1910.1200(e)(2)

Multi-employer workplaces. Employers who produce, use, or store hazardous chemicals at a workplace in such a way that the employees of other employer(s) may be exposed (for example, employees of a construction contractor working on-site) shall additionally ensure that the hazard communication programs developed and implemented under this paragraph (e) include the following:

29cfr1910.1200(e)(2)(i)

EXPLANATION of 29CFR1910.1200(e)(2)(i)

The methods the employer will use to provide the other employer(s) on-site access to material safety data sheets for each hazardous chemical the other employer(s)' employees may be exposed to while working;

29cfr1910.1200(e)(2)(ii)

EXPLANATION of 29CFR1910.1200(e)(2)(ii)

The methods the employer will use to inform the other employer(s) of any precautionary measures that need to be taken to protect employees during the workplace's normal operating conditions and in foreseeable emergencies; and,

29cfr1910.1200(e)(2)(iii)

EXPLANATION of 29CFR1910.1200(e)(2)(iii)

The methods the employer will use to inform the other employer(s) of the labeling system used in the workplace.

29cfr1910.1200(e)(3)

EXPLANATION of 29CFR1910.1200(e)(3)

The employer may rely on an existing hazard communication program to comply with these requirements, provided that it meets the criteria established in this paragraph (e).

29cfr1910.1200(e)(4)

EXPLANATION of 29CFR1910.1200(e)(4)

The employer shall make the written hazard communication program available, upon request, to employees, their designated representatives, the Assistant Secretary and the Director, in accordance with the requirements of 29 CFR 1910.20(e).

29cfr1910.1200(e)(5)

EXPLANATION of 29CFR1910.1200(e)(5)

Where employees must travel between workplaces during a workshift, *i.e.*, their work is carried out at more than one geographical location, the written hazard communication program may be kept at the primary workplace facility.

29cfr1910.1200(f)

EXPLANATION of 29CFR1910.1200(f)

Labels and other forms of warning.

29cfr1910.1200(f)(1)

EXPLANATION of 29CFR1910.1200(f)(1)

The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following information:

29cfr1910.1200(f)(1)(i)

EXPLANATION of 29CFR1910.1200(f)(1)(i)

Identity of the hazardous chemical(s);

29cfr1910.1200(f)(1)(ii)

EXPLANATION of 29CFR1910.1200(f)(1)(ii)

Appropriate hazard warnings; and

29cfr1910.1200(f)(1)(iii)

EXPLANATION of 29CFR1910.1200(f)(1)(iii)

Name and address of the chemical manufacturer, importer, or other responsible party.

29cfr1910.1200(f)(2)

EXPLANATION of 29CFR1910.1200(f)(2)

29cfr1910.1200(f)(2)(i)

EXPLANATION of 29CFR1910.1200(f)(2)(i)

For solid metal (such as a steel beam or a metal casting), solid wood, or plastic items that are not exempted as articles due to their downstream use, or shipments of whole grain, the required label may be transmitted to the customer at the time of the initial shipment, and need not be included with subsequent shipments to the same employer unless the information on the label changes;

29cfr1910.1200(f)(2)(ii)

EXPLANATION of 29CFR1910.1200(f)(2)(ii)

The label may be transmitted with the initial shipment itself, or with the material safety data sheet that is to be provided prior to or at the time of the first shipment; and,

29cfr1910.1200(f)(2)(iii)

EXPLANATION of 29CFR1910.1200(f)(2)(iii)

This exception to requiring labels on every container of hazardous chemicals is only for the solid material itself, and does not apply to hazardous chemicals used in conjunction with, or known to be present with, the material and to which employees handling the items in transit may be exposed (for example, cutting fluids or pesticides in grains).

29cfr1910.1200(f)(3)

EXPLANATION of 29CFR1910.1200(f)(3)

Chemical manufacturers, importers, or distributors shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked in accordance with this section in a manner which does not conflict with the requirements of the Hazardous Materials Transportation Act (49 U.S.C. 1801 *et seq.*) and regulations issued under that Act by the Department of Transportation.

29cfr1910.1200(f)(4)

EXPLANATION of 29CFR1910.1200(f)(4)

If the hazardous chemical is regulated by OSHA in a substance-specific health standard, the chemical manufacturer, importer, distributor or employer shall ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

29cfr1910.1200(f)(5)

EXPLANATION of 29CFR1910.1200(f)(5)

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Except as provided in paragraphs (f)(6) and (f)(7) of this section, the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:

29cfr1910.1200(f)(5)(i)

EXPLANATION of 29CFR1910.1200(f)(5)(i)

Identity of the hazardous chemical(s) contained therein; and,

29cfr1910.1200(f)(5)(ii)

EXPLANATION of 29CFR1910.1200(f)(5)(ii)

Appropriate hazard warnings, or alternatively, 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 communication program, will provide employees with the specific information regarding the physical and health hazards of the hazardous chemical.

29cfr1910.1200(f)(6)

EXPLANATION of 29CFR1910.1200(f)(6)

The employer may use signs, placards, process sheets, batch tickets, operating procedures, or other such written materials in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the information required by paragraph (f)(5) of this section to be on a label. The written materials shall be readily accessible to the employees in their work area throughout each work shift.

29cfr1910.1200(f)(7)

EXPLANATION of 29CFR1910.1200(f)(7)

The employer is not required to label portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer. For purposes of this section, drugs which are dispensed by a pharmacy to a health care provider for

direct administration to a patient are exempted from labeling.

29cfr1910.1200(f)(8)

EXPLANATION of 29CFR1910.1200(f)(8)

The employer shall not remove or deface existing labels on incoming containers of hazardous chemicals, unless the container is immediately marked with the required information.

29cfr1910.1200(f)(9)

EXPLANATION of 29CFR1910.1200(f)(9)

The employer shall ensure that labels or other forms of warning are legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift. Employers having employees who speak other languages may add the information in their language to the material presented, as long as the information is presented in English as well.

29cfr1910.1200(f)(10)

EXPLANATION of 29CFR1910.1200(f)(10)

The chemical manufacturer, importer, distributor or employer need not affix new labels to comply with this section if existing labels already convey the required information.

29cfr1910.1200(f)(11)

EXPLANATION of 29CFR1910.1200(f)(11)

Chemical manufacturers, importers, distributors, or employers who become newly aware of any significant information regarding the hazards of a chemical shall revise the labels for the chemical within three months of becoming aware of the new information. Labels on containers of hazardous chemicals shipped after that time shall contain the new information. If the chemical is not currently produced or imported, the chemical manufacturer, importers, distributor, or employer shall add the information to the label before the chemical is shipped or introduced into the workplace again.

29cfr1910.1200(g)

EXPLANATION of 29CFR1910.1200(g)

Material safety data sheets.

29cfr1910.1200(g)(1)

EXPLANATION of 29CFR1910.1200(g)(1)

Chemical manufacturers and importers shall obtain or develop a material safety data sheet for each hazardous chemical they produce or import. Employers shall have a material safety data sheet in the workplace for each hazardous chemical which they use.

29cfr1910.1200(g)(2)

EXPLANATION of 29CFR1910.1200(g)(2)

Each material safety data sheet shall be in English (although the employer may maintain copies in other languages as well), and shall contain at least the following information:

29cfr1910.1200(g)(2)(i)

EXPLANATION of 29CFR1910.1200(g)(2)(i)

The identity used on the label, and, except as provided for in paragraph (i) of this section on trade secrets:

29cfr1910.1200(g)(2)(i)(A)

EXPLANATION of 29CFR1910.1200(g)(2)(i)(A)

If the hazardous chemical is a single substance, its chemical and common name(s);

29cfr1910.1200(g)(2)(i)(B)

EXPLANATION of 29CFR1910.1200(g)(2)(i)(B)

If the hazardous chemical is a mixture which has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients which

contribute to these known hazards, and the common name(s) of the mixture itself, or,

29cfr1910.1200(g)(2)(i)(C)

EXPLANATION of 29CFR1910.1200(g)(2)(i)(C)

If the hazardous chemical is a mixture which has not been tested as a whole:

29cfr1910.1200(g)(2)(i)(C)(1)

EXPLANATION of 29CFR1910.1200(g)(2)(i)(C)(1)

The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise 1% or greater of the composition, except that chemicals identified as carcinogens under paragraph (d) of this section shall be listed if the concentrations are 0.1% or greater, and,

29cfr1910.1200(g)(2)(i)(C)(2)

EXPLANATION of 29CFR1910.1200(g)(2)(i)(C)(2)

The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise less than 1% (0.1% for carcinogens) of the mixture, if there is evidence that the ingredient(s) could be released from the mixture in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees; and,

29cfr1910.1200(g)(2)(i)(C)(3)

EXPLANATION of 29CFR1910.1200(g)(2)(i)(C)(3)

The chemical and common name(s) of all ingredients which have been determined to present a physical hazard when present in the mixture;

29cfr1910.1200(g)(2)(ii)

EXPLANATION of 29CFR1910.1200(g)(2)(ii)

Physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point);

29cfr1910.1200(g)(2)(iii)

EXPLANATION of 29CFR1910.1200(g)(2)(iii)

The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity;

29cfr1910.1200(g)(2)(iv)

EXPLANATION of 29CFR1910.1200(g)(2)(iv)

The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical;

29cfr1910.1200(g)(2)(v)

EXPLANATION of 29CFR1910.1200(g)(2)(v)

The primary route(s) of entry;

29cfr1910.1200(g)(2)(vi)

EXPLANATION of 29CFR1910.1200(g)(2)(vi)

The OSHA permissible exposure limit, ACGIH Threshold Limit Value, and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet, where available;

29cfr1910.1200(g)(2)(vii)

EXPLANATION of 29CFR1910.1200(g)(2)(vii)

Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions), or by OSHA;

29cfr1910.1200(g)(2)(viii)

EXPLANATION of 29CFR1910.1200(g)(2)(viii)

Any generally applicable precautions for safe handling and use which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks;

29cfr1910.1200(g)(2)(ix)

EXPLANATION of 29CFR1910.1200(g)(2)(ix)

Any generally applicable control measures which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment;

29cfr1910.1200(g)(2)(x)

EXPLANATION of 29CFR1910.1200(g)(2)(x)

Emergency and first aid procedures;

29cfr1910.1200(g)(2)(xi)

EXPLANATION of 29CFR1910.1200(g)(2)(xi)

The date of preparation of the material safety data sheet or the last change to it; and,

29cfr1910.1200(g)(2)(xii)

EXPLANATION of 29CFR1910.1200(g)(2)(xii)

The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

29cfr1910.1200(g)(3)

EXPLANATION of 29CFR1910.1200(g)(3)

If no relevant information is found for any given category on the material safety data sheet, the chemical manufacturer, importer or employer preparing the material safety data sheet shall mark it to indicate that no applicable information was found.

29cfr1910.1200(g)(4)

EXPLANATION of 29CFR1910.1200(g)(4)

Where complex mixtures have similar hazards and contents (i.e. the chemical ingredients are essentially the same, but the specific composition varies from mixture to mixture), the chemical manufacturer, importer or employer may prepare one material safety data sheet to apply to all of these similar mixtures.

29cfr1910.1200(g)(5)

EXPLANATION of 29CFR1910.1200(g)(5)

The chemical manufacturer, importer or employer preparing the material safety data sheet shall ensure that the information recorded accurately reflects the scientific evidence used in making the hazard determination. If the chemical manufacturer, importer or employer preparing the material safety data sheet becomes newly aware of any significant information regarding the hazards of a chemical, or ways to protect against the hazards, this new information shall be added to the material safety data sheet within three months. If the chemical is not currently being produced or imported the chemical manufacturer or importer shall add the information to the material safety data sheet before the chemical is introduced into the workplace again.

29cfr1910.1200(g)(6)

EXPLANATION of 29CFR1910.1200(g)(6)

29cfr1910.1200(g)(6)(i)

EXPLANATION of 29CFR1910.1200(g)(6)(i)

Chemical manufacturers or importers shall ensure that distributors and employers are provided an appropriate material safety data sheet with their initial shipment, and with the first shipment after a material safety data sheet is updated;

29cfr1910.1200(g)(6)(ii)

EXPLANATION of 29CFR1910.1200(g)(6)(ii)

The chemical manufacturer or importer shall either provide material safety data sheets with the shipped containers or send them to the distributor or employer prior to or at the time of the shipment;

29cfr1910.1200(g)(6)(iii)

EXPLANATION of 29CFR1910.1200(g)(6)(iii)

If the material safety data sheet is not provided with a shipment that has been labeled as a hazardous chemical, the distributor or employer shall obtain one from the chemical manufacturer or importer as soon as possible; and,

29cfr1910.1200(g)(6)(iv)

EXPLANATION of 29CFR1910.1200(g)(6)(iv)

The chemical manufacturer or importer shall also provide distributors or employers with a material safety data sheet upon request.

29cfr1910.1200(g)(7)

EXPLANATION of 29CFR1910.1200(g)(7)

29cfr1910.1200(g)(7)(i)

EXPLANATION of 29CFR1910.1200(g)(7)(i)

Distributors shall ensure that material safety data sheets, and updated information, are provided to other distributors and employers with their initial shipment and with the first shipment after a material safety data sheet is updated;

29cfr1910.1200(g)(7)(ii)

EXPLANATION of 29CFR1910.1200(g)(7)(ii)

The distributor shall either provide material safety data sheets with the shipped containers, or send them to the other distributor or employer prior to or at the time

of the shipment;

29cfr1910.1200(g)(7)(iii)

EXPLANATION of 29CFR1910.1200(g)(7)(iii)

Retail distributors selling hazardous chemicals to employers having a commercial account shall provide a material safety data sheet to such employers upon request, and shall post a sign or otherwise inform them that a material safety data sheet is available;

29cfr1910.1200(g)(7)(iv)

EXPLANATION of 29CFR1910.1200(g)(7)(iv)

Wholesale distributors selling hazardous chemicals to employers over-the-counter may also, as an alternative to keeping a file of material safety data sheets for all hazardous chemicals they sell, provide material safety data sheets upon the request of the employer at the time of the over-the-counter purchase, and shall post a sign or otherwise inform such employers that a material safety data sheet is available;

29cfr1910.1200(g)(7)(v)

EXPLANATION of 29CFR1910.1200(g)(7)(v)

If an employer without a commercial account purchases a hazardous chemical from a retail distributor not required to have material safety data sheets on file (*i.e.*, the retail distributor does not have commercial accounts and does not use the materials), the retail distributor shall provide the employer, upon request, with the name, address, and telephone number of the chemical manufacturer, importer, or distributor from which a material safety data sheet can be obtained;

29cfr1910.1200(g)(7)(vi)

EXPLANATION of 29CFR1910.1200(g)(7)(vi)

Wholesale distributors shall also provide material safety data sheets to employers or other distributors upon request; and,

29cfr1910.1200(g)(7)(vii)

EXPLANATION of 29CFR1910.1200(g)(7)(vii)

Chemical manufacturers, importers, and distributors need not provide material safety data sheets to retail distributors that have informed them that the retail distributor does not sell the product to commercial accounts or open the sealed container to use it in their own workplaces.

29cfr1910.1200(g)(8)

EXPLANATION of 29CFR1910.1200(g)(8)

The employer shall maintain in the workplace copies of the required material safety data sheets for each hazardous chemical, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s). (Electronic access, microfiche, and other alternatives to maintaining paper copies of the material safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options).

29cfr1910.1200(g)(9)

EXPLANATION of 29CFR1910.1200(g)(9)

Where employees must travel between workplaces during a workshift, *i.e.*, their work is carried out at more than one geographical location, the material safety data sheets may be kept at the primary workplace facility. In this situation, the employer shall ensure that employees can immediately obtain the required information in an emergency.

29cfr1910.1200(g)(10)

EXPLANATION of 29CFR1910.1200(g)(10)

Material safety data sheets may be kept in any form, including operating procedures, and may be designed to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. However, the employer shall ensure that in all cases the required information is provided for each hazardous chemical, and is readily accessible during each work shift to employees when they are in their work area(s).

29cfr1910.1200(g)(11)

EXPLANATION of 29CFR1910.1200(g)(11)

Material safety data sheets shall also be made readily available, upon request, to designated representatives and to the Assistant Secretary, in accordance with the requirements of 29 CFR 1910.20(e). The Director shall also be given access to material safety data sheets in the same manner.

29cfr1910.1200(h)

EXPLANATION of 29CFR1910.1200(h)

Employee information and training.

29cfr1910.1200(h)(1)

EXPLANATION of 29CFR1910.1200(h)(1)

Employers shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new physical or health hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and material safety data sheets.

29cfr1910.1200(h)(2)

EXPLANATION of 29CFR1910.1200(h)(2)

Information. Employees shall be informed of:

29cfr1910.1200(h)(2)(i)

EXPLANATION of 29CFR1910.1200(h)(2)(i)

The requirements of this section;

29cfr1910.1200(h)(2)(ii)

EXPLANATION of 29CFR1910.1200(h)(2)(ii)

Any operations in their work area where hazardous chemicals are present; and,
29cfr1910.1200(h)(2)(iii)

EXPLANATION of 29CFR1910.1200(h)(2)(iii)

The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.

29cfr1910.1200(h)(3)

EXPLANATION of 29CFR1910.1200(h)(3)

Training. Employee training shall include at least:

29cfr1910.1200(h)(3)(i)

EXPLANATION of 29CFR1910.1200(h)(3)(i)

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.);

29cfr1910.1200(h)(3)(ii)

EXPLANATION of 29CFR1910.1200(h)(3)(ii)

The physical and health hazards of the chemicals in the work area;

29cfr1910.1200(h)(3)(iii)

EXPLANATION of 29CFR1910.1200(h)(3)(iii)

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 personal protective equipment to be used; and,

29cfr1910.1200(h)(3)(iv)

EXPLANATION of 29CFR1910.1200(h)(3)(iv)

The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

29cfr1910.1200(h)(3)(i)

EXPLANATION of 29CFR1910.1200(h)(3)(i)

Trade secrets. (1) The chemical manufacturer, importer, or employer may withhold the specific chemical identity, including the chemical name and other specific identification of a hazardous chemical, from the material safety data sheet, provided that:

29cfr1910.1200(h)(3)(i)

EXPLANATION of 29CFR1910.1200(h)(3)(i)

The claim that the information withheld is a trade secret can be supported;

29cfr1910.1200(h)(3)(ii)

EXPLANATION of 29CFR1910.1200(h)(3)(ii)

Information contained in the material safety data sheet concerning the properties and effects of the hazardous chemical is disclosed;

29cfr1910.1200(h)(3)(iii)

EXPLANATION of 29CFR1910.1200(h)(3)(iii)

The material safety data sheet indicates that the specific chemical identity is being withheld as a trade secret; and,

29cfr1910.1200(h)(3)(iv)

EXPLANATION of 29CFR1910.1200(h)(3)(iv)

The specific chemical identity is made available to health professionals, employees,

and designated representatives in accordance with the applicable provisions of this paragraph.

29cfr1910.1200(h)(2)

EXPLANATION of 29CFR1910.1200(h)(2)

Where a treating physician or nurse determines that a medical emergency exists and the specific chemical identity of a hazardous chemical is necessary for emergency or first-aid treatment, the chemical manufacturer, importer, or employer shall immediately disclose the specific chemical identity of a trade secret chemical to that treating physician or nurse, regardless of the existence of a written statement of need or a confidentiality agreement. The chemical manufacturer, importer, or employer may require a written statement of need and confidentiality agreement, in accordance with the provisions of paragraphs (i) (3) and (4) of this section, as soon as circumstances permit.

29cfr1910.1200(h)(3)

EXPLANATION of 29CFR1910.1200(h)(3)

In non-emergency situations, a chemical manufacturer, importer, or employer shall, upon request, disclose a specific chemical identity, otherwise permitted to be withheld under paragraph (i)(1) of this section, to a health professional (i.e. physician, industrial hygienist, toxicologist, epidemiologist, or occupational health nurse) providing medical or other occupational health services to exposed employee(s), and to employees or designated representatives, if:

29cfr1910.1200(h)(3)(i)

EXPLANATION of 29CFR1910.1200(h)(3)(i)

The request is in writing;

29cfr1910.1200(h)(3)(ii)

EXPLANATION of 29CFR1910.1200(h)(3)(ii)

The request describes with reasonable detail one or more of the following occupational health needs for the information:

29cfr1910.1200(h)(3)(ii)(A)

EXPLANATION of 29CFR1910.1200(h)(3)(ii)(A)

To assess the hazards of the chemicals to which employees will be exposed;

29cfr1910.1200(h)(3)(ii)(B)

EXPLANATION of 29CFR1910.1200(h)(3)(ii)(B)

To conduct or assess sampling of the workplace atmosphere to determine employee exposure levels;

29cfr1910.1200(h)(3)(ii)(C)

EXPLANATION of 29CFR1910.1200(h)(3)(ii)(C)

To conduct pre-assignment or periodic medical surveillance of exposed employees;

29cfr1910.1200(h)(3)(ii)(D)

EXPLANATION of 29CFR1910.1200(h)(3)(ii)(D)

To provide medical treatment to exposed employees;

29cfr1910.1200(h)(3)(ii)(E)

EXPLANATION of 29CFR1910.1200(h)(3)(ii)(E)

To select or assess appropriate personal protective equipment for exposed employees;

29cfr1910.1200(h)(3)(ii)(F)

EXPLANATION of 29CFR1910.1200(h)(3)(ii)(F)

To design or assess engineering controls or other protective measures for exposed employees; and,

29cfr1910.1200(h)(3)(ii)(G)

EXPLANATION of 29CFR1910.1200(h)(3)(ii)(G)

To conduct studies to determine the health effects of exposure.

29cfr1910.1200(h)(3)(iii)

EXPLANATION of 29CFR1910.1200(h)(3)(iii)

The request explains in detail why the disclosure of the specific chemical identity is essential and that, in lieu thereof, the disclosure of the following information to the health professional, employee, or designated representative, would not satisfy the purposes described in paragraph (i)(3)(ii) of this section:

29cfr1910.1200(h)(3)(iii)(A)

EXPLANATION of 29CFR1910.1200(h)(3)(iii)(A)

The properties and effects of the chemical;

29cfr1910.1200(h)(3)(iii)(B)

EXPLANATION of 29CFR1910.1200(h)(3)(iii)(B)

Measures for controlling workers' exposure to the chemical;

29cfr1910.1200(h)(3)(iii)(C)

EXPLANATION of 29CFR1910.1200(h)(3)(iii)(C)

Methods of monitoring and analyzing worker exposure to the chemical; and,

29cfr1910.1200(h)(3)(iii)(D)

EXPLANATION of 29CFR1910.1200(h)(3)(iii)(D)

Methods of diagnosing and treating harmful exposures to the chemical;

29cfr1910.1200(h)(3)(iv)

EXPLANATION of 29CFR1910.1200(h)(3)(iv)

The request includes a description of the procedures to be used to maintain the confidentiality of the disclosed information; and,

29cfr1910.1200(h)(3)(v)

EXPLANATION of 29CFR1910.1200(h)(3)(v)

The health professional, and the employer or contractor of the services of the health professional (i.e. downstream employer, labor organization, or individual employee), employee, or designated representative, agree in a written confidentiality agreement that the health professional, employee, or designated representative, will not use the trade secret information for any purpose other than the health need(s) asserted and agree not to release the information under any circumstances other than to OSHA, as provided in paragraph (i)(6) of this section, except as authorized by the terms of the agreement or by the chemical manufacturer, importer, or employer.

29cfr1910.1200(h)(4)

EXPLANATION of 29CFR1910.1200(h)(4)

The confidentiality agreement authorized by paragraph (i)(3)(iv) of this section:

29cfr1910.1200(h)(4)(i)

EXPLANATION of 29CFR1910.1200(h)(4)(i)

May restrict the use of the information to the health purposes indicated in the written statement of need;

29cfr1910.1200(h)(4)(ii)

EXPLANATION of 29CFR1910.1200(h)(4)(ii)

May provide for appropriate legal remedies in the event of a breach of the agreement, including stipulation of a reasonable pre-estimate of likely damages; and,

29cfr1910.1200(h)(4)(iii)

EXPLANATION of 29CFR1910.1200(h)(4)(iii)

May not include requirements for the posting of a penalty bond.

29cfr1910.1200(h)(5)

EXPLANATION of 29CFR1910.1200(h)(5)

Nothing in this standard is meant to preclude the parties from pursuing non-contractual remedies to the extent permitted by law.

29cfr1910.1200(h)(6)

EXPLANATION of 29CFR1910.1200(h)(6)

If the health professional, employee, or designated representative receiving the trade secret information decides that there is a need to disclose it to OSHA, the chemical manufacturer, importer, or employer who provided the information shall be informed by the health professional, employee, or designated representative prior to, or at the same time as, such disclosure.

29cfr1910.1200(h)(7)

EXPLANATION of 29CFR1910.1200(h)(7)

If the chemical manufacturer, importer, or employer denies a written request for disclosure of a specific chemical identity, the denial must:

29cfr1910.1200(h)(7)(i)

EXPLANATION of 29CFR1910.1200(h)(7)(i)

Be provided to the health professional, employee, or designated representative, within thirty days of the request;

29cfr1910.1200(h)(7)(ii)

EXPLANATION of 29CFR1910.1200(h)(7)(ii)

Be in writing;

29cfr1910.1200(h)(7)(iii)

EXPLANATION of 29CFR1910.1200(h)(7)(iii)

Include evidence to support the claim that the specific chemical identity is a trade secret;

29cfr1910.1200(h)(7)(iv)

EXPLANATION of 29CFR1910.1200(h)(7)(iv)

State the specific reasons why the request is being denied; and,

29cfr1910.1200(h)(7)(v)

EXPLANATION of 29CFR1910.1200(h)(7)(v)

Explain in detail how alternative information may satisfy the specific medical or occupational health need without revealing the specific chemical identity.

29cfr1910.1200(h)(8)

EXPLANATION of 29CFR1910.1200(h)(8)

The health professional, employee, or designated representative whose request for information is denied under paragraph (i)(3) of this section may refer the request and the written denial of the request to OSHA for consideration.

29cfr1910.1200(h)(9)

EXPLANATION of 29CFR1910.1200(h)(9)

When a health professional, employee, or designated representative refers the denial to OSHA under paragraph (i)(8) of this section, OSHA shall consider the evidence to determine if:

29cfr1910.1200(h)(9)(i)

EXPLANATION of 29CFR1910.1200(h)(9)(i)

The chemical manufacturer, importer, or employer has supported the claim that the specific chemical identity is a trade secret;

29cfr1910.1200(h)(9)(ii)

EXPLANATION of 29CFR1910.1200(h)(9)(ii)

The health professional, employee, or designated representative has supported the claim that there is a medical or occupational health need for the information; and,

29cfr1910.1200(h)(9)(iii)

EXPLANATION of 29CFR1910.1200(h)(9)(iii)

The health professional, employee or designated representative has demonstrated adequate means to protect the confidentiality.

29cfr1910.1200(h)(10)

EXPLANATION of 29CFR1910.1200(h)(10)

29cfr1910.1200(h)(10)(i)

EXPLANATION of 29CFR1910.1200(h)(10)(i)

If OSHA determines that the specific chemical identity requested under paragraph (i)(3) of this section is not a *bona fide* trade secret, or that it is a trade secret, but the requesting health professional, employee, or designated representative has a legitimate medical or occupational health need for the information, has executed a written confidentiality agreement, and has shown adequate means to protect the confidentiality of the information, the chemical manufacturer, importer, or employer will be subject to citation by OSHA.

29cfr1910.1200(h)(10)(ii)

EXPLANATION of 29CFR1910.1200(h)(10)(ii)

If a chemical manufacturer, importer, or employer demonstrates to OSHA that the execution of a confidentiality agreement would not provide sufficient protection against the potential harm from the unauthorized disclosure of a trade secret specific chemical identity, the Assistant Secretary may issue such orders or impose such additional limitations or conditions upon the disclosure of the requested chemical information as may be appropriate to assure that the occupational health services are provided without an undue risk of harm to the chemical manufacturer, importer, or employer.

29cfr1910.1200(h)(11)

EXPLANATION of 29CFR1910.1200(h)(11)

If a citation for a failure to release specific chemical identity information is contested by the chemical manufacturer, importer, or employer, the matter will be adjudicated before the Occupational Safety and Health Review Commission in accordance with the Act's enforcement scheme and the applicable Commission rules of procedure. In accordance with the Commission rules, when a chemical manufacturer, importer, or employer continues to withhold the information during the contest, the Administrative Law Judge may review the citation and supporting documentation *in camera* or issue appropriate orders to protect the confidentiality of such matters.

29cfr1910.1200(h)(12)

EXPLANATION of 29CFR1910.1200(h)(12)

Notwithstanding the existence of a trade secret claim, a chemical manufacturer, importer, or employer shall, upon request, disclose to the Assistant Secretary any information which this section requires the chemical manufacturer, importer, or employer to make available. Where there is a trade secret claim, such claim shall be made no later than at the time the information is provided to the Assistant Secretary so that suitable determinations of trade secret status can be made and the necessary protections can be implemented.

29cfr1910.1200(h)(13)

EXPLANATION of 29CFR1910.1200(h)(13)

Nothing in this paragraph shall be construed as requiring the disclosure under any circumstances of process or percentage of mixture information which is a trade secret.

29cfr1910.1200(j)

EXPLANATION of 29CFR1910.1200(j)

Effective dates. Chemical manufacturers, importers, distributors, and employers shall be in compliance with all provisions of this section by March 11, 1994.

Note: The effective date of the clarification that the exemption of wood and wood products from the Hazard Communication standard in paragraph (b)(6)(iv) only

applies to wood and wood products including lumber which will not be processed, where the manufacturer or importer can establish that the only hazard they pose to employees is the potential for flammability or combustibility, and that the exemption does not apply to wood or wood products which have been treated with a hazardous chemical covered by this standard, and wood which may be subsequently sawed or cut generating dust has been stayed from March 11, 1994 to August 11, 1994.

Appendix A to §1910.1200—Health Hazard Definitions (Mandatory)

Although safety hazards related to the physical characteristics of a chemical can be objectively defined in terms of testing requirements (e.g. flammability), health hazard definitions are less precise and more subjective. Health hazards may cause measurable changes in the body—such as decreased pulmonary function. These changes are generally indicated by the occurrence of signs and symptoms in the exposed employees—such as shortness of breath, a non-measurable, subjective feeling. Employees exposed to such hazards must be apprised of both the change in body function and the signs and symptoms that may occur to signal that change.

The determination of occupational health hazards is complicated by the fact that many of the effects or signs and symptoms occur commonly in non-occupationally exposed populations, so that effects of exposure are difficult to separate from normally occurring illnesses. Occasionally, a substance causes an effect that is rarely seen in the population at large, such as angiosarcomas caused by vinyl chloride exposure, thus making it easier to ascertain that the occupational exposure was the primary causative factor. More often, however, the effects are common, such as lung cancer. The situation is further complicated by the fact that most chemicals have not been adequately tested to determine their health hazard potential, and data do not exist to substantiate these effects.

There have been many attempts to categorize effects and to define them in various ways. Generally, the terms "acute" and "chronic" are used to delineate between effects on the basis of severity or duration. "Acute" effects usually occur rapidly as a result of short-term exposures, and are of short duration. "Chronic" effects generally occur as a result of long-term exposure, and are of long duration.

The acute effects referred to most frequently are those defined by the American

National Standards Institute (ANSI) standard for Precautionary Labeling of Hazardous Industrial Chemicals (Z129.1-1988)—irritation, corrosivity, sensitization and lethal dose. Although these are important health effects, they do not adequately cover the considerable range of acute effects which may occur as a result of occupational exposure, such as, for example, narcosis.

Similarly, the term chronic effect is often used to cover only carcinogenicity, teratogenicity, and mutagenicity. These effects are obviously a concern in the workplace, but again, do not adequately cover the area of chronic effects, excluding, for example, blood dyscrasias (such as anemia), chronic bronchitis and liver atrophy.

The goal of defining precisely, in measurable terms, every possible health effect that may occur in the workplace as a result of chemical exposures cannot realistically be accomplished. This does not negate the need for employees to be informed of such effects and protected from them. Appendix B, which is also mandatory, outlines the principles and procedures of hazard assessment.

For purposes of this section, any chemicals which meet any of the following definitions, as determined by the criteria set forth in Appendix B are health hazards. However, this is not intended to be an exclusive categorization scheme. If there are available scientific data that involve other animal species or test methods, they must also be evaluated to determine the applicability of the HCS.

1. *Carcinogen*: A chemical is considered to be a carcinogen if:

It has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen; or

It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or,

It is regulated by OSHA as a carcinogen.

2. *Corrosive*: A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. For example, a chemical is considered to be corrosive if, when tested on the intact skin of albino

rabbits by the method described by the U.S. Department of Transportation in appendix A to 49 CFR part 173, it destroys or changes irreversibly the structure of the tissue at the site of contact following an exposure period of four hours. This term shall not refer to action on inanimate surfaces.

3. *Highly toxic:* A chemical falling within any of the following categories:

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.

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.

A chemical that has a median lethal concentration (LC₅₀) 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.

4. *Irritant:* A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact. A chemical is a skin irritant if, when tested on the intact skin of albino rabbits by the methods of 16 CFR 1500.41 for four hours exposure or by other appropriate techniques, it results in an empirical score of five or more. A chemical is an eye irritant if so determined under the procedure listed in 16 CFR 1500.42 or other appropriate techniques.

5. *Sensitizer:* A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

6. *Toxic.* A chemical falling within any of the following categories:

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.

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.

A chemical that has a median lethal concentration (LC₅₀) 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.

7. Target organ effects.

The following is a target organ categorization of effects which may occur, including examples of signs and symptoms and chemicals which have been found to cause such effects. These examples are presented to illustrate the range and diversity of effects and hazards found in the workplace, and the broad scope employers must consider in this area, but are not intended to be all-inclusive.

a. Hepatotoxins: Chemicals which produce liver damage

Signs & Symptoms: Jaundice; liver enlargement

Chemicals: Carbon tetrachloride; nitrosamines

b. Nephrotoxins: Chemicals which produce kidney damage

Signs & Symptoms: Edema; proteinuria

Chemicals: Halogenated hydrocarbons; uranium

c. Neurotoxins: Chemicals which produce their primary toxic effects on the nervous system

Signs & Symptoms: Narcosis; behavioral changes; decrease in motor functions

Chemicals: Mercury; carbon disulfide

d. Agents which act on the blood or hemato-poietic system: Decrease hemoglobin function; deprive the body tissues of oxygen

Signs & Symptoms: Cyanosis; loss of consciousness

Chemicals: Carbon monoxide; cyanides

e. Agents which damage the lung: Chemicals which irritate or damage pulmonary tissue

Signs & Symptoms: Cough; tightness in chest; shortness of breath

Chemicals: Silica; asbestos

f. Reproductive toxins: Chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis)

Signs & Symptoms: Birth defects; sterility

Chemicals: Lead; DBCP

g. Cutaneous hazards: Chemicals which affect the dermal layer of the body

Signs & Symptoms: Defatting of the skin; rashes; irritation

Chemicals: Ketones; chlorinated compounds

h. Eye hazards: Chemicals which affect the eye or visual capacity

Signs & Symptoms: Conjunctivitis; corneal damage

Chemicals: Organic solvents; acids

Appendix B to §1910.1200—Hazard Determination (*Mandatory*)

The quality of a hazard communication program is largely dependent upon the adequacy and accuracy of the hazard determination. The hazard determination requirement of this standard is performance-oriented. Chemical manufacturers, importers, and employers evaluating chemicals are not required to follow any specific methods for determining hazards, but they must be able to demonstrate that

they have adequately ascertained the hazards of the chemicals produced or imported in accordance with the criteria set forth in this Appendix.

Hazard evaluation is a process which relies heavily on the professional judgment of the evaluator, particularly in the area of chronic hazards. The performance-orientation of the hazard determination does not diminish the duty of the chemical manufacturer, importer or employer to conduct a thorough evaluation, examining all relevant data and producing a scientifically defensible evaluation. For purposes of this standard, the following criteria shall be used in making hazard determinations that meet the requirements of this standard.

1. *Carcinogenicity*: As described in paragraph (d)(4) of this section and Appendix A of this section, a determination by the National Toxicology Program, the International Agency for Research on Cancer, or OSHA that a chemical is a carcinogen or potential carcinogen will be considered conclusive evidence for purposes of this section. In addition, however, all available scientific data on carcinogenicity must be evaluated in accordance with the provisions of this Appendix and the requirements of the rule.
2. *Human data*: Where available, epidemiological studies and case reports of adverse health effects shall be considered in the evaluation.
3. *Animal data*: Human evidence of health effects in exposed populations is generally not available for the majority of chemicals produced or used in the workplace. Therefore, the available results of toxicological testing in animal populations shall be used to predict the health effects that may be experienced by exposed workers. In particular, the definitions of certain acute hazards refer to specific animal testing results (see Appendix A).
4. *Adequacy and reporting of data*. The results of any studies which are designed and conducted according to established scientific principles, and which report statistically significant conclusions regarding the health effects of a chemical, shall be a sufficient basis for a hazard determination and reported on any material safety data sheet. *In vitro* studies alone generally do not form the basis for a definitive finding of hazard under the HCS since they have a positive or negative result rather than a statistically significant finding.

The chemical manufacturer, importer, or employer may also report the results of other scientifically valid studies which tend to refute the findings of hazard.

Appendix C to §1910.1200;—Information Sources (Advisory)

The following is a list of available data sources which the chemical manufacturer, importer, distributor, or employer may wish to consult to evaluate the hazards of chemicals they produce or import:

—Any information in their own company files, such as toxicity testing results or illness experience of company employees.

—Any information obtained from the supplier of the chemical, such as material safety data sheets or product safety bulletins.

—Any pertinent information obtained from the following source list (latest editions should be used):

Condensed Chemical Dictionary

Van Nostrand Reinhold Co., 135 West 50th Street, New York, NY 10020.

The Merck Index: An Encyclopedia of Chemicals and Drugs

Merck and Company, Inc., 126 E. Lincoln Ave., Rahway, NJ 07065.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man

Geneva: World Health Organization, International Agency for Research on Cancer, 1972–Present. (Multivolume work). Summaries are available in supplement volumes. 49 Sheridan Street, Albany, NY 12210.

Industrial Hygiene and Toxicology, by F.A. Patty

John Wiley & Sons, Inc., New York, NY (Multivolume work).

Clinical Toxicology of Commercial Products

Gleason, Gosselin, and Hodge.

Casarett and Doull's Toxicology; The Basic Science of Poisons

SHINTECH-000802

Doull, Klaassen, and Amdur, Macmillan Publishing Co., Inc., New York, NY.

Industrial Toxicology, by Alice Hamilton and Harriet L. Hardy

Publishing Sciences Group, Inc., Acton, MA.

Toxicology of the Eye, by W. Morton Grant

Charles C. Thomas, 301-327 East Lawrence Avenue, Springfield, IL.

Recognition of Health Hazards in Industry

William A. Burgess, John Wiley and Sons, 605 Third Avenue, New York, NY 10158.

Chemical Hazards of the Workplace

Nick H. Proctor and James P. Hughes, J.P. Lipincott Company, 6 Winchester Terrace, New York, NY 10022.

Handbook of Chemistry and Physics

Chemical Rubber Company, 18901 Cranwood Parkway, Cleveland, OH 44128.

Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment and Biological Exposure Indices with Intended Changes

American Conference of Governmental Industrial Hygienists (ACGIH), 6500 Glenway Avenue, Bldg. D-5, Cincinnati, OH 45211.

Information on the physical hazards of chemicals may be found in publications of the National Fire Protection Association, Boston, MA.

Note: The following documents may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Occupational Health Guidelines

NIOSH/OSHA (NIOSH Pub. No. 81-123).

NIOSH Pocket Guide to Chemical Hazards

NIOSH Pub. No. 90-117.

Registry of Toxic Effects of Chemical Substances

Miscellaneous Documents published by the National Institute for Occupational Safety and Health:

Criteria documents.

Special Hazard Reviews.

Occupational Hazard Assessments.

Current Intelligence Bulletins.

OSHA's General Industry Standards (29 CFR Part 1910)

NTP Annual Report on Carcinogens and Summary of the Annual Report on Carcinogens.

National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161; (703) 487-4650.

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Lockheed--DIALOG Information Service, Inc., 3460 Hillview Avenue, Palo Alto, CA 94304.	Biosis Prev. Files CA Search Files CAB Abstracts Chemical Exposure Chemname Chemsis Files Chemzero Embase Files

SHINTECH-000804

OSH Federal Regulations

SDC--ORBIT, SDC Information Service,
2500 Colorado Avenue, Santa Monica,
CA 90406.

National Library of Medicine

Department of Health and Human
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Appendix D to §1910.1200;—Definition of "Trade Secret" (Mandatory)

The following is a reprint of the *Restatement of Torts* section 757, comment *b* (1939):

b. Definition of trade secret. A trade secret may consist of any formula, pattern, device or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it. It may be a formula for a chemical compound, a process of manufacturing, treating or preserving materials, a pattern for a machine or other device, or a list of customers. It differs from other secret information in a business (see §759 of the *Restatement of Torts* which is not included in this Appendix) in that

it is not simply information as to single or ephemeral events in the conduct of the business, as, for example, the amount or other terms of a secret bid for a contract or the salary of certain employees, or the security investments made or contemplated, or the date fixed for the announcement of a new policy or for bringing out a new model or the like. A trade secret is a process or device for continuous use in the operations of the business. Generally it relates to the production of goods, as, for example, a machine or formula for the production of an article. It may, however, relate to the sale of goods or to other operations in the business, such as a code for determining discounts, rebates or other concessions in a price list or catalogue, or a list of specialized customers, or a method of bookkeeping or other office management.

Secrecy. The subject matter of a trade secret must be secret. Matters of public knowledge or of general knowledge in an industry cannot be appropriated by one as his secret. Matters which are completely disclosed by the goods which one markets cannot be his secret. Substantially, a trade secret is known only in the particular business in which it is used. It is not requisite that only the proprietor of the business know it. He may, without losing his protection, communicate it to employees involved in its use. He may likewise communicate it to others pledged to secrecy. Others may also know of it independently, as, for example, when they have discovered the process or formula by independent invention and are keeping it secret. Nevertheless, a substantial element of secrecy must exist, so that, except by the use of improper means, there would be difficulty in acquiring the information. An exact definition of a trade secret is not possible. Some factors to be considered in determining whether given information is one's trade secret are: (1) The extent to which the information is known outside of his business; (2) the extent to which it is known by employees and others involved in his business; (3) the extent of measures taken by him to guard the secrecy of the information; (4) the value of the information to him and his competitors; (5) the amount of effort or money expended by him in developing the information; (6) the ease or difficulty with which the information could be properly acquired or duplicated by others.

Novelty and prior art. A trade secret may be a device or process which is patentable; but it need not be that. It may be a device or process which is clearly anticipated in the prior art or one which is merely a mechanical improvement that a good mechanic can make. Novelty and invention are not requisite for a trade secret

as they are for patentability. These requirements are essential to patentability because a patent protects against unlicensed use of the patented device or process even by one who discovers it properly through independent research. The patent monopoly is a reward to the inventor. But such is not the case with a trade secret. Its protection is not based on a policy of rewarding or otherwise encouraging the development of secret processes or devices. The protection is merely against breach of faith and reprehensible means of learning another's secret. For this limited protection it is not appropriate to require also the kind of novelty and invention which is a requisite of patentability. The nature of the secret is, however, an important factor in determining the kind of relief that is appropriate against one who is subject to liability under the rule stated in this Section. Thus, if the secret consists of a device or process which is a novel invention, one who acquires the secret wrongfully is ordinarily enjoined from further use of it and is required to account for the profits derived from his past use. If, on the other hand, the secret consists of mechanical improvements that a good mechanic can make without resort to the secret, the wrongdoer's liability may be limited to damages, and an injunction against future use of the improvements made with the aid of the secret may be inappropriate.

Appendix E to §1910.1200 (Advisory)—Guidelines for Employer Compliance

The Hazard Communication Standard (HCS) is based on a simple concept—that employees have both a need and a right to know the hazards and identities of the chemicals they are exposed to when working. They also need to know what protective measures are available to prevent adverse effects from occurring. The HCS is designed to provide employees with the information they need.

Knowledge acquired under the HCS will help employers provide safer workplaces for their employees. When employers have information about the chemicals being used, they can take steps to reduce exposures, substitute less hazardous materials, and establish proper work practices. These efforts will help prevent the occurrence of work-related illnesses and injuries caused by chemicals.

The HCS addresses the issues of evaluating and communicating hazards to workers. Evaluation of chemical hazards involves a number of technical concepts, and is a process that requires the professional judgment of experienced experts. That's why the HCS is designed so that employers who simply use chemicals, rather than

produce or import them, are not required to evaluate the hazards of those chemicals. Hazard determination is the responsibility of the producers and importers of the materials. Producers and importers of chemicals are then required to provide the hazard information to employers that purchase their products.

Employers that don't produce or import chemicals need only focus on those parts of the rule that deal with establishing a workplace program and communicating information to their workers. This appendix is a general guide for such employers to help them determine what's required under the rule. It does not supplant or substitute for the regulatory provisions, but rather provides a simplified outline of the steps an average employer would follow to meet those requirements.

1. Becoming Familiar With The Rule.

OSHA has provided a simple summary of the HCS in a pamphlet entitled "Chemical Hazard Communication," OSHA Publication Number 3084. Some employers prefer to begin to become familiar with the rule's requirements by reading this pamphlet. A copy may be obtained from your local OSHA Area Office, or by contacting the OSHA Publications Office at (202) 523-9667.

The standard is long, and some parts of it are technical, but the basic concepts are simple. In fact, the requirements reflect what many employers have been doing for years. You may find that you are already largely in compliance with many of the provisions, and will simply have to modify your existing programs somewhat. If you are operating in an OSHA-approved State Plan State, you must comply with the State's requirements, which may be different than those of the Federal rule. Many of the State Plan States had hazard communication or "right-to-know" laws prior to promulgation of the Federal rule. Employers in State Plan States should contact their State OSHA offices for more information regarding applicable requirements.

The HCS requires information to be prepared and transmitted regarding all hazardous chemicals. The HCS covers both physical hazards (such as flammability), and health hazards (such as irritation, lung damage, and cancer). Most chemicals used in the workplace have some hazard potential, and thus will be covered by the rule.

One difference between this rule and many others adopted by OSHA is that this one

is performance-oriented. That means that you have the flexibility to adapt the rule to the needs of your workplace, rather than having to follow specific, rigid requirements. It also means that you have to exercise more judgment to implement an appropriate and effective program.

The standard's design is simple. Chemical manufacturers and importers must evaluate the hazards of the chemicals they produce or import. Using that information, they must then prepare labels for containers, and more detailed technical bulletins called material safety data sheets (MSDS).

Chemical manufacturers, importers, and distributors of hazardous chemicals are all required to provide the appropriate labels and material safety data sheets to the employers to which they ship the chemicals. The information is to be provided automatically. Every container of hazardous chemicals you receive must be labeled, tagged, or marked with the required information. Your suppliers must also send you a properly completed material safety data sheet (MSDS) at the time of the first shipment of the chemical, and with the next shipment after the MSDS is updated with new and significant information about the hazards.

You can rely on the information received from your suppliers. You have no independent duty to analyze the chemical or evaluate the hazards of it.

Employers that "use" hazardous chemicals must have a program to ensure the information is provided to exposed employees. "Use" means to package, handle, react, or transfer. This is an intentionally broad scope, and includes any situation where a chemical is present in such a way that employees may be exposed under normal conditions of use or in a foreseeable emergency.

The requirements of the rule that deal specifically with the hazard communication program are found in this section in paragraphs (e), written hazard communication program; (f), labels and other forms of warning; (g), material safety data sheets; and (h), employee information and training. The requirements of these paragraphs should be the focus of your attention. Concentrate on becoming familiar with them, using paragraphs (b), scope and application, and (c), definitions, as references when needed to help explain the provisions.

There are two types of work operations where the coverage of the rule is limited.

These are laboratories and operations where chemicals are only handled in sealed containers (e.g., a warehouse). The limited provisions for these workplaces can be found in paragraph (b) of this section, scope and application. Basically, employers having these types of work operations need only keep labels on containers as they are received; maintain material safety data sheets that are received, and give employees access to them; and provide information and training for employees. Employers do not have to have written hazard communication programs and lists of chemicals for these types of operations.

The limited coverage of laboratories and sealed container operations addresses the obligation of an employer to the workers in the operations involved, and does not affect the employer's duties as a distributor of chemicals. For example, a distributor may have warehouse operations where employees would be protected under the limited sealed container provisions. In this situation, requirements for obtaining and maintaining MSDSs are limited to providing access to those received with containers while the substance is in the workplace, and requesting MSDSs when employees request access for those not received with the containers. However, as a distributor of hazardous chemicals, that employer will still have responsibilities for providing MSDSs to downstream customers at the time of the first shipment and when the MSDS is updated. Therefore, although they may not be required for the employees in the work operation, the distributor may, nevertheless, have to have MSDSs to satisfy other requirements of the rule.

2. Identify Responsible Staff

Hazard communication is going to be a continuing program in your facility. Compliance with the HCS is not a "one shot deal." In order to have a successful program, it will be necessary to assign responsibility for both the initial and ongoing activities that have to be undertaken to comply with the rule. In some cases, these activities may already be part of current job assignments. For example, site supervisors are frequently responsible for on-the-job training sessions. Early identification of the responsible employees, and involvement of them in the development of your plan of action, will result in a more effective program design. Evaluation of the effectiveness of your program will also be enhanced by involvement of affected employees.

For any safety and health program, success depends on commitment at every level

of the organization. This is particularly true for hazard communication, where success requires a change in behavior. This will only occur if employers understand the program, and are committed to its success, and if employees are motivated by the people presenting the information to them.

3. Identify Hazardous Chemicals in the Workplace.

The standard requires a list of hazardous chemicals in the workplace as part of the written hazard communication program. The list will eventually serve as an inventory of everything for which an MSDS must be maintained. At this point, however, preparing the list will help you complete the rest of the program since it will give you some idea of the scope of the program required for compliance in your facility.

The best way to prepare a comprehensive list is to survey the workplace. Purchasing records may also help, and certainly employers should establish procedures to ensure that in the future purchasing procedures result in MSDSs being received before a material is used in the workplace.

The broadest possible perspective should be taken when doing the survey. Sometimes people think of "chemicals" as being only liquids in containers. The HCS covers chemicals in all physical forms—liquids, solids, gases, vapors, fumes, and mists—whether they are "contained" or not. The hazardous nature of the chemical and the potential for exposure are the factors which determine whether a chemical is covered. If it's not hazardous, it's not covered. If there is no potential for exposure (e.g., the chemical is inextricably bound and cannot be released), the rule does not cover the chemical.

Look around. Identify chemicals in containers, including pipes, but also think about chemicals generated in the work operations. For example, welding fumes, dusts, and exhaust fumes are all sources of chemical exposures. Read labels provided by suppliers for hazard information. Make a list of all chemicals in the workplace that are potentially hazardous. For your own information and planning, you may also want to note on the list the location(s) of the products within the workplace, and an indication of the hazards as found on the label. This will help you as you prepare the rest of your program.

Paragraph (b) of this section, scope and application, includes exemptions for various chemicals or workplace situations. After compiling the complete list of chemicals, you should review paragraph (b) of this section to determine if any of the items can be eliminated from the list because they are exempted materials. For example, food, drugs, and cosmetics brought into the workplace for employee consumption are exempt. So rubbing alcohol in the first aid kit would not be covered.

Once you have compiled as complete a list as possible of the potentially hazardous chemicals in the workplace, the next step is to determine if you have received material safety data sheets for all of them. Check your files against the inventory you have just compiled. If any are missing, contact your supplier and request one. It is a good idea to document these requests, either by copy of a letter or a note regarding telephone conversations. If you have MSDSs for chemicals that are not on your list, figure out why. Maybe you don't use the chemical anymore. Or maybe you missed it in your survey. Some suppliers do provide MSDSs for products that are not hazardous. These do not have to be maintained by you.

You should not allow employees to use any chemicals for which you have not received an MSDS. The MSDS provides information you need to ensure proper protective measures are implemented prior to exposure.

4. Preparing and Implementing a Hazard Communication Program

All workplaces where employees are exposed to hazardous chemicals must have a written plan which describes how the standard will be implemented in that facility. Preparation of a plan is not just a paper exercise—all of the elements must be implemented in the workplace in order to be in compliance with the rule. See paragraph (e) of this section for the specific requirements regarding written hazard communication programs. The only work operations which do not have to comply with the written plan requirements are laboratories and work operations where employees only handle chemicals in sealed containers. See paragraph (b) of this section, scope and application, for the specific requirements for these two types of workplaces.

The plan does not have to be lengthy or complicated. It is intended to be a blueprint

for implementation of your program—an assurance that all aspects of the requirements have been addressed.

Many trade associations and other professional groups have provided sample programs and other assistance materials to affected employers. These have been very helpful to many employers since they tend to be tailored to the particular industry involved. You may wish to investigate whether your industry trade groups have developed such materials.

Although such general guidance may be helpful, you must remember that the written program has to reflect what you are doing in your workplace. Therefore, if you use a generic program it must be adapted to address the facility it covers. For example, the written plan must list the chemicals present at the site, indicate who is to be responsible for the various aspects of the program in your facility, and indicate where written materials will be made available to employees.

If OSHA inspects your workplace for compliance with the HCS, the OSHA compliance officer will ask to see your written plan at the outset of the inspection. In general, the following items will be considered in evaluating your program.

The written program must describe how the requirements for labels and other forms of warning, material safety data sheets, and employee information and training, are going to be met in your facility. The following discussion provides the type of information compliance officers will be looking for to decide whether these elements of the hazard communication program have been properly addressed:

A. Labels and Other Forms of Warning

In-plant containers of hazardous chemicals must be labeled, tagged, or marked with the identity of the material and appropriate hazard warnings. Chemical manufacturers, importers, and distributors are required to ensure that every container of hazardous chemicals they ship is appropriately labeled with such information and with the name and address of the producer or other responsible party. Employers purchasing chemicals can rely on the labels provided by their suppliers. If the material is subsequently transferred by the employer from a labeled container to another container, the employer will have to label that container unless it is subject to the portable container exemption. See paragraph (f) of this section

for specific labeling requirements.

The primary information to be obtained from an OSHA-required label is an identity for the material, and appropriate hazard warnings. The identity is any term which appears on the label, the MSDS, and the list of chemicals, and thus links these three sources of information. The identity used by the supplier may be a common or trade name ("Black Magic Formula"), or a chemical name (1,1,1,-trichloroethane). The hazard warning is a brief statement of the hazardous effects of the chemical ("flammable," "causes lung damage"). Labels frequently contain other information, such as precautionary measures ("do not use near open flame"), but this information is provided voluntarily and is not required by the rule. Labels must be legible, and prominently displayed. There are no specific requirements for size or color, or any specified text.

With these requirements in mind, the compliance officer will be looking for the following types of information to ensure that labeling will be properly implemented in your facility:

1. Designation of person(s) responsible for ensuring labeling of in-plant containers;
2. Designation of person(s) responsible for ensuring labeling of any shipped containers;
3. Description of labeling system(s) used;
4. Description of written alternatives to labeling of in-plant containers (if used); and,
5. Procedures to review and update label information when necessary.

Employers that are purchasing and using hazardous chemicals—rather than producing or distributing them—will primarily be concerned with ensuring that every purchased container is labeled. If materials are transferred into other containers, the employer must ensure that these are labeled as well, unless they fall under the portable container exemption (paragraph (f)(7) of this section). In terms of labeling systems, you can simply choose to use the labels provided by your suppliers on the containers. These will generally be verbal text labels, and do not usually include numerical rating systems or symbols that require special training.

The most important thing to remember is that this is a continuing duty—all in-plant containers of hazardous chemicals must always be labeled. Therefore, it is important to designate someone to be responsible for ensuring that the labels are maintained as required on the containers in your facility, and that newly purchased materials are checked for labels prior to use.

B. Material Safety Data Sheets

Chemical manufacturers and importers are required to obtain or develop a material safety data sheet for each hazardous chemical they produce or import. Distributors are responsible for ensuring that their customers are provided a copy of these MSDSs. Employers must have an MSDS for each hazardous chemical which they use. Employers may rely on the information received from their suppliers. The specific requirements for material safety data sheets are in paragraph (g) of this section.

There is no specified format for the MSDS under the rule, although there are specific information requirements. OSHA has developed a non-mandatory format, OSHA Form 174, which may be used by chemical manufacturers and importers to comply with the rule. The MSDS must be in English. You are entitled to receive from your supplier a data sheet which includes all of the information required under the rule. If you do not receive one automatically, you should request one. If you receive one that is obviously inadequate, with, for example, blank spaces that are not completed, you should request an appropriately completed one. If your request for a data sheet or for a corrected data sheet does not produce the information needed, you should contact your local OSHA Area Office for assistance in obtaining the MSDS.

The role of MSDSs under the rule is to provide detailed information on each hazardous chemical, including its potential hazardous effects, its physical and chemical characteristics, and recommendations for appropriate protective measures. This information should be useful to you as the employer responsible for designing protective programs, as well as to the workers. If you are not familiar with material safety data sheets and with chemical terminology, you may need to learn to use them yourself. A glossary of MSDS terms may be helpful in this regard. Generally speaking, most employers using hazardous chemicals will primarily be concerned with MSDS information regarding hazardous effects and recommended protective

measures. Focus on the sections of the MSDS that are applicable to your situation.

MSDSs must be readily accessible to employees when they are in their work areas during their workshifts. This may be accomplished in many different ways. You must decide what is appropriate for your particular workplace. Some employers keep the MSDSs in a binder in a central location (*e.g.*, in the pick-up truck on a construction site). Others, particularly in workplaces with large numbers of chemicals, computerize the information and provide access through terminals. As long as employees can get the information when they need it, any approach may be used. The employees must have access to the MSDSs themselves—simply having a system where the information can be read to them over the phone is only permitted under the mobile worksite provision, paragraph (g)(9) of this section, when employees must travel between workplaces during the shift. In this situation, they have access to the MSDSs prior to leaving the primary worksite, and when they return, so the telephone system is simply an emergency arrangement.

In order to ensure that you have a current MSDS for each chemical in the plant as required, and that employee access is provided, the compliance officers will be looking for the following types of information in your written program:

1. Designation of person(s) responsible for obtaining and maintaining the MSDSs;
2. How such sheets are to be maintained in the workplace (*e.g.*, in notebooks in the work area(s) or in a computer with terminal access), and how employees can obtain access to them when they are in their work area during the work shift;
3. Procedures to follow when the MSDS is not received at the time of the first shipment;
4. For producers, procedures to update the MSDS when new and significant health information is found; and,
5. Description of alternatives to actual data sheets in the workplace, if used.

For employers using hazardous chemicals, the most important aspect of the written program in terms of MSDSs is to ensure that someone is responsible for obtaining and maintaining the MSDSs for every hazardous chemical in the workplace. The list of hazardous chemicals required to be maintained as part of the written program

will serve as an inventory. As new chemicals are purchased, the list should be updated. Many companies have found it convenient to include on their purchase orders the name and address of the person designated in their company to receive MSDSs.

C. Employee Information and Training

Each employee who may be "exposed" to hazardous chemicals when working must be provided information and trained prior to initial assignment to work with a hazardous chemical, and whenever the hazard changes. "Exposure" or "exposed" under the rule means that "an employee is subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.) and includes potential (e.g., accidental or possible) exposure." See paragraph (h) of this section for specific requirements. Information and training may be done either by individual chemical, or by categories of hazards (such as flammability or carcinogenicity). If there are only a few chemicals in the workplace, then you may want to discuss each one individually. Where there are large numbers of chemicals, or the chemicals change frequently, you will probably want to train generally based on the hazard categories (e.g., flammable liquids, corrosive materials, carcinogens). Employees will have access to the substance-specific information on the labels and MSDSs.

Information and training is a critical part of the hazard communication program. Information regarding hazards and protective measures are provided to workers through written labels and material safety data sheets. However, through effective information and training, workers will learn to read and understand such information, determine how it can be obtained and used in their own workplaces, and understand the risks of exposure to the chemicals in their workplaces as well as the ways to protect themselves. A properly conducted training program will ensure comprehension and understanding. It is not sufficient to either just read material to the workers, or simply hand them material to read. You want to create a climate where workers feel free to ask questions. This will help you to ensure that the information is understood. You must always remember that the underlying purpose of the HCS is to reduce the incidence of chemical source illnesses and injuries. This will be accomplished by modifying behavior through the provision of hazard information and information about protective measures. If your program works,

you and your workers will better understand the chemical hazards within the workplace. The procedures you establish regarding, for example, purchasing, storage, and handling of these chemicals will improve, and thereby reduce the risks posed to employees exposed to the chemical hazards involved. Furthermore, your workers' comprehension will also be increased, and proper work practices will be followed in your workplace.

If you are going to do the training yourself, you will have to understand the material and be prepared to motivate the workers to learn. This is not always an easy task, but the benefits are worth the effort. More information regarding appropriate training can be found in OSHA Publication No. 2254 which contains voluntary training guidelines prepared by OSHA's Training Institute. A copy of this document is available from OSHA's Publications Office at (202) 219-4667.

In reviewing your written program with regard to information and training, the following items need to be considered:

1. Designation of person(s) responsible for conducting training;
2. Format of the program to be used (audiovisuals, classroom instruction, etc.);
3. Elements of the training program (should be consistent with the elements in paragraph (h) of this section); and,
4. Procedure to train new employees at the time of their initial assignment to work with a hazardous chemical, and to train employees when a new hazard is introduced into the workplace.

The written program should provide enough details about the employer's plans in this area to assess whether or not a good faith effort is being made to train employees. OSHA does not expect that every worker will be able to recite all of the information about each chemical in the workplace. In general, the most important aspects of training under the HCS are to ensure that employees are aware that they are exposed to hazardous chemicals, that they know how to read and use labels and material safety data sheets, and that, as a consequence of learning this information, they are following the appropriate protective measures established by the employer. OSHA compliance officers will be talking to employees to determine if they have received training, if they know they are exposed to hazardous chemicals, and if they

know where to obtain substance-specific information on labels and MSDSs.

The rule does not require employers to maintain records of employee training, but many employers choose to do so. This may help you monitor your own program to ensure that all employees are appropriately trained. If you already have a training program, you may simply have to supplement it with whatever additional information is required under the HCS. For example, construction employers that are already in compliance with the construction training standard (29 CFR 1926.21) will have little extra training to do.

An employer can provide employees information and training through whatever means are found appropriate and protective. Although there would always have to be some training on-site (such as informing employees of the location and availability of the written program and MSDSs), employee training may be satisfied in part by general training about the requirements of the HCS and about chemical hazards on the job which is provided by, for example, trade associations, unions, colleges, and professional schools. In addition, previous training, education and experience of a worker may relieve the employer of some of the burdens of informing and training that worker. Regardless of the method relied upon, however, the employer is always ultimately responsible for ensuring that employees are adequately trained. If the compliance officer finds that the training is deficient, the employer will be cited for the deficiency regardless of who actually provided the training on behalf of the employer.

D. Other Requirements

In addition to these specific items, compliance officers will also be asking the following questions in assessing the adequacy of the program:

Does a list of the hazardous chemicals exist in each work area or at a central location?

Are methods the employer will use to inform employees of the hazards of non-routine tasks outlined?

Are employees informed of the hazards associated with chemicals contained in unlabeled pipes in their work areas?

On multi-employer worksites, has the employer provided other employers with information about labeling systems and precautionary measures where the other employers have employees exposed to the initial employer's chemicals?

Is the written program made available to employees and their designated representatives?

If your program adequately addresses the means of communicating information to employees in your workplace, and provides answers to the basic questions outlined above, it will be found to be in compliance with the rule.

5. Checklist for Compliance

The following checklist will help to ensure you are in compliance with the rule:

Obtained a copy of the rule. _____

Read and understood the requirements. _____

Assigned responsibility for tasks. _____

Prepared an inventory of chemicals. _____

Ensured containers are labeled. _____

Obtained MSDS for each chemical. _____

Prepared written program. _____

Made MSDSs available to workers. _____

Conducted training of workers. _____

Established procedures to maintain current program. _____

Established procedures to evaluate effectiveness. _____

6. Further Assistance

If you have a question regarding compliance with the HCS, you should contact your local OSHA Area Office for assistance. In addition, each OSHA Regional Office has a Hazard Communication Coordinator who can answer your questions.

OSH Federal Regulations

Free consultation services are also available to assist employers, and information regarding these services can be obtained through the Area and Regional offices as well.

The telephone number for the OSHA office closest to you should be listed in your local telephone directory. If you are not able to obtain this information, you may contact OSHA's Office of Information and Consumer Affairs at (202) 219-8151 for further assistance in identifying the appropriate contacts.