



PESTICIDES AND MATERIAL SAFETY DATA SHEETS An Introduction to the Hazard Communication Standard

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INTRODUCTION.

During the past several decades, there has been a growing awareness of the importance of safety in American industry. This awareness has been brought into sharper focus by the news media, government, and the public, triggered in part by major chemical accidents such as the Bhopal, India, chemical explosion in 1984. Such tragic events evoke a painful appreciation of the high cost to business and society when safety is not adequately addressed.

Safety is no less an issue for the pest control industry. Government regulation and industry programs place emphasis on the safe manufacture, distribution, use, and disposal of pesticides. Examples of government action: the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard; and Environmental Protection Agency regulations under the Emergency Planning and Community Right-to-Know Act. On the industry side, there is the Responsible Care Program of the Chemical Manufacturers Association.

This publication focuses on the role of the material safety data sheet (MSDS), a key element of OSHA's Hazard Communication Standard, in providing guidance and direction for safer manufacture and handling of pesticides. In addition, product labeling, worker training, and worker access to chemical hazard information are addressed.

SAFETY WITH PESTICIDES IS EVERYONE'S RESPONSIBILITY_____

Well Trained Workers Are Necessary

Today's pest control industry is highly competitive. Therefore, employers must hire and retain highly skilled individuals to perform the multitude of tasks associated with manufacturing, distributing, handling, and storing pesticides. Most managers realize that employees do not become "skilled" overnight; experience is essential to proficiency. Educational training programs serve to develop skills, improve worker competency, and promote job awareness and productivity.

Delivering a competitive, quality pest control service requires more than simply knowing how to control pests. Employee safety training programs are critical in reducing transportation accidents, preventing off-target pesticide movement, demonstrating the proper use of personal protective equipment, and averting monetary losses and injuries to workers caused by pesticide spills or releases. There are other benefits, too. Employees who fully understand their jobs will assist in reducing losses from regulatory fines, employee lawsuits, hazardous waste cleanups, worker compensation claims, and property damage suits. Time and money spent on providing safety and job performance training will pay big dividends by reducing production losses, boosting company profitability, and facilitating employee retention.

Employer's Commitment to Pesticide Safety

Pesticide-related businesses need to conduct regular, indepth audits to identify all potential chemical hazards on the premises and at job sites; and more than application procedures alone must be recognized as potential risks. For instance, pesticide storage, container rinsing and disposal, excess product disposal, and the transportation of hazardous chemicals all carry a risk potential.

Audits alert employers to the presence of hazardous chemicals and practices which should be corrected through alternative chemical selection and the implementation of safety programs to reduce risk potential.

Putting safety programs in place and *practicing* pesticide safety require an aggressive and continuous commitment by management. This is facilitated by educating the work force to focus on and implement safety strategies. Workers must understand that their adherence to safety protocol



developed by an employer is *mandatory* for long-term employment. Employers who openly share information with employees and mandate safety rule compliance communicate to their workers, in effect, that they are concerned about their safety and well being.

Employees Must Share Responsibility

E mployees play a major role in fostering safety in the workplace; employers cannot maintain a safe working environment without the full cooperation and active involvement of their workers. Employees must be trained to recognize potential safety problems, to avert those problems, and to exercise appropriate steps to prevent exposure to pesticides and other hazardous materials. Written company policy should state that much of the responsibility for maintaining safety in the workplace rests on the employees themselves; and it should be stressed that a pesticide safety program is only as good as the commitment of employees to take it seriously.

Employees must be constantly alert to safety concerns and understand that the greatest threat to their well-being occurs when they do not follow prescribed safety practices in the workplace. Not only should workers recognize potential problems and how to prevent them, they also must be prepared to respond to chemical emergencies such as pesticide warehouse fires, accidental poisonings, and tank ruptures on service vehicles. Preventive strategies and a thorough knowledge of proper reactionary steps are essential components of pesticide safety policies.

Failure to recognize the potentially serious consequences of a pesticide emergency can, in itself, prove catastrophic. Employees who ignore safety practices increase the likelihood of injury to themselves and others. Loss of income, the cost of medical treatment, and job loss resulting in financial strain are potential consequences of even a minor safety problem. Also, negative publicity from a safety-related incident can damage the company's reputation.

Pesticide Safety Is a Shared Responsibility

All jobs involving pesticides—indoors or outdoors, manufacturing or service—carry a hazard potential. Conscious responsibility for the safe transportation, storage, and handling of pesticides and other hazardous materials must be assumed at every level: manufacturing facilities, distribution outlets, and application industries. Each segment of the pesticide industry bears the responsibility to conduct its business in a manner whereby employees are trained and safe work practices are in place.

Both labor and management bear safety responsibilities. Both must commit to job safety each and every day through practice and communication. Today's increased focus on and attention to safety considerations require that everyone associated with pesticides (janitor, secretary, supervisor, applicator, etc.) have some knowledge of the products being stored and handled within the business. The responsibility for using pesticides safely—that is, taking the steps necessary to protect human health and the environment—cannot be taken lightly by either labor or management.



THE HAZARD COMMUNICATION STANDARD

Over time, state and federal government has assumed more and more responsibility for ensuring that workers are provided a safe working environment. The Occupational Safety and Health Act of 1970 led to the creation of the Occupational Safety and Health Administration (OSHA) within the United States Department of Labor. The Occupational Safety and Health Act consolidated many of the existing federal worker safety laws under the OSHA umbrella. This law also authorized the establishment of regulations to ensure that employees are provided information on the hazards to which they may be exposed, and that precautions are taken to prevent or reduce exposure to hazardous chemicals.

The Occupational Safety and Health Act also provides OSHA with a mechanism for entering into cooperative agreement with state agencies to enforce worker protection rules within the states' boundaries. Federal and state programs mandate safety in the workplace, through regulations, and promote such safety through educational and technical assistance.

OSHA enacted the federal Hazard Communication Standard (HCS) (29 CFR 1910.1200) in 1983. Only employees in manufacturing industries were covered by the original version of HCS; but in 1989 it was expanded to cover *all employees* who (potentially) may be exposed to hazardous chemicals in their work areas—regardless of the place of employment or nature of the industry.

The HCS is the cornerstone of each employee's right-toknow. Its strategy is to ensure that hazardous chemicals are fully evaluated and their hazards communicated to workers by means of labels, material safety data sheets, and training programs.

Many OSHA regulations have specific goals, whereas HCS sets only general performance standards which employers have the flexibility to adapt to their specific workplace, work force, work practices, and work situations. Information on each chemical is customized to ensure that all potential hazards are properly addressed.

The HCS clearly requires each employer using hazardous chemicals to develop, implement, and maintain at the workplace a written hazard communication program for employees. The employer also must provide training to inform employees (1) about the nature of hazardous chemicals in each work area, (2) how to detect a release of hazardous chemicals in the work area, and (3) what measures to take to protect themselves from hazardous chemicals. The employer also must ensure that all containers of hazardous chemicals in the work area are properly labeled and stored. The worker safety program must be organized into a formal written plan and made available along with MSDS's to employees, upon request.

Creation and Distribution of the MSDS

The Hazard Communication Standard requires that chemical manufacturers and importers thoroughly evaluate chemicals that they produce and import, respectively, to determine their hazard potential.

If a chemical presents a hazard, a material safety data sheet must be developed to communicate its hazard potential to users. The first step in preparing an MSDS for a hazardous chemical is to identify its composition. The product may be pure (consisting of just one component, namely, the pesticide active ingredient) or it may be a formulation of two or more chemical ingredients. Once the composition has been established, information on hazards can be collected.



Companies that prepare MSDS's may perform their own in-house tests to collect product hazard information, or they may rely on data from testing others have conducted (e.g., as when one company allows another to use its active ingredient in their product).

A large amount of pesticide hazard information is generated in the course of fulfilling regulatory requirements for product registration. EPA requires up to 120 tests, and the information gathered is principally toxicological, environmental effect, and physical property data, much of which can be used in preparing an MSDS.

Once the composition of the product is determined and the necessary data collected, an MSDS can be prepared. The steps actually used to create an MSDS vary from company to company. The process varies from (1) simply collecting the required product information in written form and typing it on a standardized MSDS form to (2) using electronic data bases. Regardless of which procedure is used, a draft of the MSDS is reviewed by key personnel within the company. Upon approval of the draft, the MSDS is printed.

The Hazard Communication Standard places specific responsibilities for the flow of product information on manufacturers, importers, distributors, and employers. Chemical

manufacturers are required by the standard to provide an MSDS to the purchaser of the product at the time of the first order and, thereafter, anytime the MSDS is significantly revised. The MSDS may be included with the pallet, submitted electronically, or delivered by mail. As the pesticides are further distributed to satellite suppliers, dealers, or users, a copy of the MSDS must accompany their original orders. This assures that the MSDS follows the same distribution route as the product itself so that employees of the manufacturer, distributor, and end users will have access to the information. Thus, MSDS's are disseminated along the distribution chain until they eventually reach businesses whose workers actually will be using the products. Some states also require that pesticide applicators provide MSDS's to their customers.

Each MSDS must be updated within 90 days of significant new information becoming known or available to the chemical manufacturer. The addition or alteration of significant MSDS information requires a new effective date for the document; as with the original MSDS, the revision must be passed along the distribution chain.

MSDS IS KEY TO COMMUNICATION _

The material safety data sheet is used to communicate information vital to the safe use and handling of each chemical or product. While both the MSDS and the pesticide label contain information intended to address potential hazards, they differ significantly.

Pesticide labels are regulated by the U.S. Environmental Protection Agency (EPA) under FIFRA and provide specific directions and precautions directed to the end user. EPA requires specific wording on and must approve all pesticide labels.

MSDS's are required by OSHA; however, they are not subject to OSHA approval. OSHA does mandate that each MSDS provide information on hazardous ingredients, physical and chemical properties, accompanying hazards, primary routes of entry, exposure limits, precautions for safe handling and use, emergency first aid procedures, and responsible party contacts. Most pesticide manufacturers also elect to include on the MSDS additional information which may be useful to those handling the material along the supply chain; e.g., regulatory sections dealing with the reporting of chemical releases, right-to-know regulations, National Fire Protection Association ratings, and Department of Transportation product classification.

The Pesticide Label



P

- Regulated by EPA under FIFRA
- Provides specific directions and precautions directed at end use and to end user of product
- Must be approved by EPA
- Only approved wording can be used

The MSDS

 Required by OSHA but not subject to OSHA approval

MSDS 🔿

OSHA mandates that
 information be provided on:

ingredients physical & chemical properties health & physical hazards primary routes of entry exposure limits precautions for safe use emergency first aid responsible party contacts

Organization of the Material Safety Data Sheet

The MSDS is a basic part of the OSHA Hazard Communication Standard, but no specific format is prescribed for the presentation of information. Therefore, MSDS's from various manufacturers may differ dramatically in order and format yet still present the required data. To help bring some order to the MSDS format, the American National Standards Institute has published the American National Standard for Hazardous Industrial Chemicals— Material Safety Data Sheets—Preparation (ANSI Z400.1-1993). This voluntary standard prescribes the division of MSDS data into 16 sections, the mandatory order and titles of which would create consistency from manufacturer to manufacturer.

ANSI Z400.1-1993 is used to illustrate key concepts for understanding and interpreting MSDS's. Although the 16 section titles and their order of appearance will be the same from manufacturer to manufacturer, the order and amount of information *within a given section* is left to the discretion of the manufacturer.

NOTE: The examples that follow were taken from numerous material safety data sheets from various suppliers; it is important to note that these examples do not represent an actual MSDS for any one product.

MATERIAL SAFETY DATA SHEET TERMINOLOGY

+ S	Section 1. Chemical Product a	and Company Identification
PRODUCT NAME:	Zapo Aminophos	Specific brand name of product.
Manufacturer:	Acme Chemical Company 123 Main Street Hometown, USA 12345-1234	Where to write for information.
GENERAL PHONE	: (800) 555-0000	Where to call for answers to non-emergency questions.
COMPANY EMERG	еncy Р ноле: (517) 123-4567	Manufacturer's number to call for emergency assistance.
CHEMTREC	(800) 424-9300	CHEMical TRansportation Emergency Center phone number. Note that this number is for a <i>transportation</i> emergency.
EPA REGISTRATI	on N umber: 99999-999	Unique number assigned by EPA to a registered pesticide product.
DATE PREPARED	January 28, 1996	The date the MSDS was prepared.
MSDS NUMBER:	000708	The number assigned to the MSDS by the manufacturer.
P roduct C ode:	45386	Specific product identification number assigned by the manufacturer.

 Section 2. Composition, Information on Ingredients 		
ACTIVE INGREDIENT (AI):	The ingredient that controls the target pest. The AI can be identified by a	
Gratol (1,1'Dimethyl)25%	common name or a chemical name. In this example, the common name is <i>Gratol</i> and the chemical name is 1,1'Dimethyl.	
CAS #999999-99-9	Active and inert ingredients also may be specifically identified by their Chemical Abstract Service (CAS) number.	
InertIngredients75%	Inert ingredients help deliver the AI. Inert ingredients known to contribute to	
Kaolinite Clay CAS #001332-58-7	the product's hazard potential must be listed by name unless they are trade secrets.	

Section 3. Hazard Identification

Emergency Overview: Orange crystalline solid. Slight acrid odor. Causes eye irritation. Harmful if swallowed or inhaled. Heating to temperatures above 158°F can lead to rapid pressure buildup. Toxic fumes are released in fire situations.

POTENTIAL HEALTH EFFECTS

Primary Routes of Entry: Eyes, lungs, skin.

Eye Contact: May cause irritation, redness, and tearing.

Skin Contact: May cause skin irritation with redness, pain, and allergic reaction based on toxicity studies and human experience.

Skin Absorption: Not known to be absorbed through the skin. Exposure is not likely to result in the material being absorbed.

Ingestion: Small amounts swallowed incidental to normal handling operations are not likely to cause injury.

Inhalation: Inhalation of dusts may cause respiratory tract irritation.

Cancer Information: Not listed as a carcinogen or potential carcinogen. Not considered to be carcinogenic in lifetime feeding studies.

Teratology: Birth defects are unlikely.

Reproductive Effects: In laboratory animal studies, this product has not been shown to interfere with reproduction.

Mutagenicity: Not mutagenic in either bacterial or mammalian cells.

A quick overview of potential hazards and description of the product's appearance. This information is intended for emergency response personnel.

Exposure sites through which the chemical might enter the body.

Effects resulting from contact of the chemical with the eye. Eye contact is a form of *dermal* exposure.

Effects resulting from contact of the chemical with the skin. Skin contact is a form of *dermal* exposure.

Effects resulting from the chemical being absorbed through the skin. Absorption through the skin is a form of *dermal* exposure.

Effects resulting from swallowing chemicals. Ingestion is called *oral* exposure.

Consequences of breathing the chemical into the lungs.

Information on any cancer-causing capabilities indicated during testing of the product ingredients (both active and inert).

Information on any birth defects that occurred in laboratory animals during testing of the chemical.

Description of impacts of the chemical on reproductive processes.

Indicates whether or not the chemical may damage genetic material (as evidenced in laboratory animals).

Section 4. First Aid Measures

Eyes: Hold eyelids apart and flush eyes with a gentle stream of water for 15 minutes. See an eye doctor immediately.

Skin: Wash with plenty of soap and water. Get medical attention if irritation persists.

Ingestion: Drink 1 or 2 glasses of water and do not induce vomiting. Call a physician or poison control center.

Inhalation: Remove victim to fresh air. Get medical attention immediately.

Note To Physician: Gratol is a mild cholinesterase inhibitor. Treat symptomatically. In case of exposure, plasma and red blood cell cholinesterase tests may indicate significance of exposure (baseline data are useful). Atropine, only by injection, is the preferable antidote. What to do if the product gets into the eyes.

What to do if the product gets on the the skin.

What to do if the product is swallowed.

What to do if the product is breathed into the lungs.

Specific instructions to the *physician*. Users of pesticides should be familiar with where this is found on MSDS's so that in an emergency the information can be given to the physician quickly.

• Section 5. Fire Fighting Measures

Flashpoint and Method: > 200°F	The minimum temperature at which a liquid gives off vapor in sufficient con- centration to ignite near the surface of the liquid or in the test vessel used.
Flammable Limits: UEL: 12.0% @ 150°F LEL: 6.5% @ 150°F	The upper explosive limit (UEL) and the lower explosive limit (LEL) concentrations in air that will produce a flash of fire when an ignition source is present.
Extinguishing Media : Use water, fog, foam, or CO_2 ; foam preferred. Water, if used, must not enter sewers.	Specific instructions to firefighters on how to extinguish a fire involving the chemical.
Fire and Explosion Hazards : Toxic, irritating gases may be formed above 320°F (160°C).	Important instructions for emergency responders dealing with fire or explosion.
Fire-Fighting Equipment: Use positive pressure, self-contained breathing apparatus and full protective clothing.	Description of safety equipment and clothing that firefighters should use in case of fire involving the chemical.

Section 6. Accidental Release Measures

Action To Take For Spills: Isolate and post spill area. Keep animals and unprotected persons out of spill area. Sweep up small spills with material such as Hazorb, Zorball, or soil. Thoroughly wash body areas which come into contact with the product. Contain spills to keep out of sewers or streams. For larger spills, consult Acme Chemical Company or CHEMTREC. Actions to take when dealing with a spill. Intended to be used by emergency responders.

• Section 7. Handling and Storage

Handling: Mechanical handling can cause formation of dusts. To reduce the potential for dust explosion, do not permit dust to accumulate outside of equipment designed to handle potentially explosive dusts. Wash thoroughly with soap and water after handling.

Storage: Do not contaminate water, food, or feed storage or disposal areas. Store in cool, dry place. Under normal handling and storage conditions, avoid heating above 158°F (70°C). Store in original containers.

Procedures for handling to minimize the risks of accidental exposure or release of the product.

Procedures and conditions for product storage that will minimize potential hazards.

Section 8. Exposure Controls, Personal Protection

Engineering Controls: Provide general and/or local exhaust ventilation to control airborne levels below exposure guidelines.

Exposure Guidelines: Gratol: American Conference of Governmental Industrial Hygienists TLV and OSHA PEL are 0.2 mg/m³ respirable. PELs are in accord with those recommended by OSHA, as in the 1989 revision of PELs.

Eye/Face Protection: Use safety glasses.

Skin Protection: Mixers, loaders, applicators and other handlers must wear a long-sleeved shirt, long pants, chemical-resistant gloves, and shoes and socks. Wash the outside of gloves before removing. Users should remove clothing immediately if pesticide gets inside. Keep and wash personal protective clothing (and any other clothing worn while handling the chemical) separate from other laundry. Personal protective equipment required for early entry permitted under the Worker Protection Standard is coveralls, waterproof gloves, and shoes and socks.

Respiratory Protection: Atmospheric levels of the chemical (either dust or vapor) should be maintained below the exposure guidelines. When respiratory protection is required for certain operations, wear a National Institute for Occupational Safety and Health (NIOSH) approved air-purifying respirator. Mixers and loaders must wear a dust/mist filtering respirator, NIOSH-approval number prefix TC-21 C. Procedures used to maintain airborne levels below TLV (Threshold Limit Value) or PEL (Permissible Exposure Limit).

TLV and PEL identify the amount of a chemical in the air, below which workers would not be expected to experience health problems from exposure during a 40-hour work week.

Describes protective measures to take to reduce the likelihood of the pesticide getting into the eyes.

Describes protective measures to take to reduce the possibility of getting the pesticide on the skin (dermal exposure).

Describes conditions under which workers must wear specific, NIOSHapproved respiratory protection to minimize the potential for breathing the chemical (inhalation exposure).

• Section 9. Physical and Chemical Properties

Vapor Pressure: Approx. 46 mmHg @ 20°C	Relates to volatility of the material.
Specific Gravity (SG): 1.18	The weight of a material compared to the weight of an equal volume of water. Insoluble materials with SG less than 1 will float on water, while those greater than 1 will sink.
Solubility in Water: 1 gram/100 milliliters	A term expressing the amount of a material that will dissolve in water.
pH: 7	pH = 7, neutral above 7, alkaline less than 7, acidic pH values from 0 to 2 and from 12 to 14 are usually corrosive to skin and eyes.
Boiling Point: 165°F (74°C)	Temperature at which a liquid becomes a vapor.
Vapor Density: 2.00 (air = 1)	Weight of a vapor or gas as compared to air. Weight of air is 1. Vapors with weight values less than 1, rise. Heavy vapors—those with weight values greater than one—sink and concen- trate.
Freezing Point: 41°F (5°C)	Temperature at which material freezes.
Odor: Weakly pungent odor	Describes the product odor for detection purposes.
Appearance: Clear	Describes the physical appearance of the chemical.

Section 10. Stability and Reactivity

Chemical Stability: Stable under recommended storage conditions. Unstable at temperatures above 266°F (130°C).

Conditions to Avoid: Accelerated rate calorimetry (ARC) data indicate that an exotherm occurs at temperatures as low as $288^{\circ}F(142^{\circ}C)$; a significant rise in pressure is associated with this exotherm. Certain conditions may facilitate occurrence of exothermic events at temperatures significantly below $288^{\circ}F$. Therefore, it is important to maintain product processing temperatures by whatever means necessary such that the temperature does not exceed $158^{\circ}F(70^{\circ}C)$.

Incompatibility with Other Materials: Gratol may be inactivated by certain sulfur-containing fertilizers.

Hazardous De composition Products : Under fire conditions, hydrogen chloride and ethyl sulfide can be formed by the breakdown of the diethyl sulfide, and nitrogen oxides can be formed.

Hazardous Polymerization: Will not occur.

Describes the stability of the material, usually in general terms.

Describes conditions under which the product may react.

Describes other materials that may react with the product.

Provides information on what by-products are formed when the product burns or under other conditions.

Tells if product will react dangerously with itself to form a new product.

Section 11. Toxicological Information

ACUTE STUDIES

Eyes: Mild irritant to rabbit eye.

Skin Contact: Short, single exposures may cause skin irritation.

Skin Absorption: The LD_{50} for skin absorption in rabbits is > 2000 mg/kg. A single prolonged exposure is not likely to result in the material being absorbed through the skin in harmful amounts.

Ingestion: The oral LD_{50} for female rats is 272 mg/kg. Product is considered moderately toxic by ingestion.

Inhalation: The LC $_{50}$ for rats is greater than 1.5 mg/liter for 4 hours. Considered toxic by inhalation.

Sensitization: Not a contact sensitizer when tested on Guinea pig skin.

CHRONIC STUDIES

Chronic Toxicity: At high doses in one of the species studied (rats) there was growth retardation and a decrease in red blood cell counts. Additional effects included increases in liver, kidney, and thyroid weights. Administration of 0,100, 500, and 2500 ppm Gratol fed to male and female young adult dogs for 6 months produced no observable effects.

Teratology: Abortion, fetal death, resorption, and developmental abnormalities occur only at maternally toxic doses.

Reproduction: A three-generation study in rats (conducted with dietary concentrations of 35, 100, and 300 ppm) showed no influence on reproduction.

Mutagenicity: Not mutagenic in either bacteria or mammalian cells.

Carcinogenicity: Not listed by national and international organizations as a carcinogen or potential carcinogen. Not judged to be carcinogenic in lifetime feeding studies.

Consequences of short-term exposure to eyes (irritancy or blindness).

Consequences of short-term exposure to the skin.

Toxicity by absorption through the skin. LD_{50} is the dose level that is expected to cause the death of 50% of the test animals.

Toxicity of short-term exposure from ingestion.

Consequences of short-term exposure from breathing. LC_{50} is the concentration of dust, fume, or mist (vapor) that is expected to kill 50% of the test animals.

An allergic reaction on tissue after repeated exposure to a chemical.

Adverse health effects resulting from long-term exposure to chemical(s), or long-term effects from short exposure.

Effects of exposure to materials that may have the capacity to cause birth defects.

Effects of exposure that may affect the ability to reproduce viable offspring.

Effects of exposure to a substance that may change the genetic material in a living cell.

The ability of a substance to cause cancer.

• Section 12. Ecological Information

ECOTOXICOLOGICAL INFORMATION

96-hour LC₅₀ bluegill sunfish: > 1000 ppm 96-hour LC₅₀ rainbow trout: > 1000 ppm 48-hour LC₅₀ daphnia magna: > 1000 ppm Oral LC₅₀ bobwhite quail: > 2250 ppm Dietary LC₅₀, bobwhite quail: > 5620 ppm Dietary LC₅₀, mallard duck: > 5620 ppm LC_{50} values state the concentration of the product (in the water) at which 50% of test animals die.

CHEMICAL FATE INFORMATION

Hydrolysis Study (28 days): half-life of 2 hours at pH 11

The amount of material that is broken down through reaction with water. Half-life describes the length of time it takes for half of the material to disappear.

Section 13. Disposal Considerations

Disposal Method: Open burning or dumping of this material or its packaging is prohibited. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, rinsate, or other pesticide waste is a violation of federal law. If these wastes cannot be disposed of by use according to label directions, contact your state pesticide or environmental control agency. Directions and limitations for disposal of the material.

• Section 14. Transport Information

DOT UN Identification No: UN2783	Number assigned by U.S. Department of Transportation (DOT) to a specific hazardous material as defined in the Hazardous Materi- als Table 49 CFR, 172.101.
DOT Hazard Class: Class 6.1	Department of Transportation recognizes 9 classes of hazardous materials, including flammables, poisons, and corrosives.
Proper Shipping Name : Organophosphorus pesticide, solid, toxic.	The name that should appear on DOT shipping papers.

• Section 15. Regulatory Information

Superfund Amendment and Reauthorization Act (SARA) Hazard Category: This product has been reviewed according to EPA "Hazard Categories" promulgated under Sections 311 and 312 of SARA 1986 (SARA Title III), and is categorized as an immediate health hazard, a delayed health hazard, and a fire hazard.

Toxic Substances Control Act (TSCA): This product is a pesticide and is exempt from TSCA regulation.

OSHA Hazard Communication Standard: This product is a "hazardous chemical" as defined by the OSHA Hazard Communication Standard 29 CFR 1910.1200.

National Fire Protection Association (NFPA) Ratings:

0 = least; 1 = slight; 2 = moderate; 3 = high; 4 = extreme

Category	Rating
Health	2
Flammability	1
Reactivity	0

Section 16. Other Information

Product Registration : This product is registered under EPA/FIFRA regulations, EPA Reg. No. 99999-999.	All pesticides must be registered by EPA before they can be offered for sale or distribution.
Reason For Issue: Revised Sections 2 and 14.	Explains where the revised MSDS differs from the one it supersedes.
Supersede Date: 06/30/93	Provides date of previous MSDS.
Responsibility for MSDS: Acme Chemical Company Registration and Regulatory Affairs 123 Main Street, Hometown, USA 12345-13	234

COMPONENTS OF THE HAZARD COMMUNICATION PROGRAM -

The latest version of the Hazard Communication Standard was published in the February 9, 1994, Federal Register (59 FR 6126); contact your state or federal OSHA for a copy, or obtain one from your trade association. The Hazard Communication Standard should be included in its entirety in the company procedures manual.

The Hazard Communication Standard requires each employer to develop a written hazard communication program when hazardous materials are used by one or more workers. The plan should not be viewed as a complicated document that serves solely to comply with OSHA requirements; a well designed plan will serve as a blueprint to increase employee awareness of chemical hazards in the workplace.

The following examples include language that employers might use to develop and implement their own written hazard communication program. Employers must determine the language and construct programs which best serve their own needs within the context of the Hazard Communication Standard. Appendices I–VIII to this publication comprise a hypothetical hazard communication program for a fictitious company; think of it as a guide in writing your own.

Responsibility for the Hazard Communication Program

Under the Hazard Communication Standard, employers are responsible for developing in writing, implementing, and maintaining a hazard communication program (Appendix I, page 30). For instance, they must write a companyspecific plan and revise it as necessary; obtain and maintain MSDS's; provide initial and follow-up training on hazardous chemicals; and ensure that labels are provided on hazardous chemicals.

Employers should distribute to each employee an annual reminder of the company's hazard communication program. It should reiterate the physical location of the plan and the purpose for having it in writing. Such annual updates should be entered as appendices in the company procedures manual (see example, page 22).

EXAMPLE: ANNUAL REMINDER

Freddie's Pest Control 720 North Chauncey Street West Lafayette, IN 47906

To: All employees of Freddie's Pest ControlFrom: Fred Whitford, PresidentDate: May 15, 2001

This is to inform you that the Occupational Safety and Health Administration *Hazard Communication Program* is on file in the main office and that it is available for your review upon request. The plan explains our general company policy and provides a list of hazardous chemicals we use, their accompanying material safety data sheets, and an outline of specific training required. The *Hazard Communication Program* is written for your protection; please take time periodically to review it. Feel free to contact me if you have any questions about the program or the role that Freddie's Pest Control will play in keeping you informed and maintaining a safe working environment.

Please sign below to verify that you have been informed of our written plan and its availability, and enter the date you read this memo. This document (bearing your signature) will be incorporated into the company policy manual.

Signature

Date

Hazardous Chemicals List

mployers should assume that chemicals accompanied by an MSDS are hazardous as defined by the OSHA Hazard Communication Standard unless the MSDS states that they are *not* The standard requires that all hazardous chemicals in a workplace be identified on a hazardous chemicals list (Appendix II, page 31). Headings for the list may include date of entry, product brand name, product manufacturer, first date in inventory, MSDS on file (yes or no), and training requirements met (yes or no); the person making the entry should sign beneath the list. See example below.

Company personnel in charge of purchasing chemicals must be aware of the hazardous chemicals list. Purchases of chemicals not previously listed need to be brought to the attention of those responsible for implementing the Hazard Communication Standard. Introduction of a new hazardous chemical would mandate acquisition of the corresponding MSDS and could trigger additional employee training. Internal audits should be conducted periodically to ensure that newly-introduced hazardous chemicals get added to the list. Such inspections could be documented as an appendix to the company procedures manual (example on page 24).

EXAMPLE: HAZARDOUS CHEMICALS LIST

Brand Name		First Date	MS	DS	Training Requiremen
of		in	Required?	On File?	Met?
Product	Manufacturer	Inventory	(Yes/No)	(Yes/No)	(Yes/No)
	Brand Name of Product	Brand Name of Product Manufacturer	Brand Name First Date of in Product Manufacturer Inventory	Brand Name First Date MS of in Required? Product Manufacturer Inventory (Yes/No)	Brand Name First Date MSDS of in Required? On File? Product Manufacturer Inventory (Yes/No) (Yes/No)

~ Freddie's Pest Control ~ Internal Audit

On May 4, 2001, I conducted a hazardous chemical inspection of Freddie's Pest Control, 720 North Chauncey Street, West Lafayette, Indiana. The inspection included the premises and all service vehicles.

The following chemicals were found on-site but not indicated on the hazardous chemicals list. As a result, the manufacturers have been contacted and material safety data sheets requested.



MSDS's for Chemicals on Hazardous Chemicals List

Suppliers are required to provide an MSDS for each product sold. All MSDS's should be easily accessible, on-site; for instance, they might be placed in a binder and/or incorporated into the company procedures manual. They may be organized alphabetically by product name or by the type of hazard they present (e.g., flammable, explosive, toxic). Employees should be informed that they can access all MSDS's on file (Appendix III, page 31).

When it is determined that MSDS's for products in inventory are not on file, they should be requested in writing from the manufacturer; and it is recommended that manufacturers be consulted concerning any product for which the hazardous chemical status is unknown. It is advisable to save copies of all letters written to manufacturers, as well as their responses; they should be entered in the company procedures manual. Whenever MSDS's are received from manufacturers and suppliers, they should be checked automatically against the effective date of those already on file for the same products. Those determined to be updates should replace older versions in the company procedures manual; and those representing new acquisitions should be entered. The hazardous chemicals list should be checked periodically to confirm its accuracy and to confirm that MSDS's for all hazardous chemicals used by the company are on file.

Labels and Other Forms of Warning

The Hazard Communication Standard requires that workers be informed of the potential dangers of all hazardous chemicals in the workplace, and labels are required on all containers (Appendix IV, page 32). Employers must ensure that minimum requirements are met. The identification of all products and their corresponding hazards must be clearly identified on the product container and communicated to workers in writing and/or in pictures, with symbols, or via any combination thereof. If both of these conditions are met on the label attached to the container, employers are not required to attach additional information. Pesticide products are labeled according to EPA mandates and are exempt from OSHA labeling requirements.

Supervisors should conduct periodic (e.g., monthly) inspections to ensure that all containers are properly labeled. Records of these formal inspections should be entered in the company procedures manual (example below).

EXAMPLE: LABEL INSPECTION

~ Freddie's Pest Control ~ Record of Label Inspection

On February 8, 2001, I performed an inspection of Freddie's Pest Control, 720 North Chauncey Street, West Lafayette, Indiana, to ensure that all containers of hazardous chemicals were labeled; the inspection included the premises and all fleet vehicles.

The containers listed below were found to be inadequately labeled; however, each container now has been properly labeled as indicated below. Employees have been informed of the importance of having all chemicals properly labeled and advised as to how the unmarked containers were labeled.

Product	Type of Container	How Problem Container Was Resolved		
	l	Ι		
Signature		Date		

Non-Routine Tasks

Non-routine tasks are those assigned to workers who do not perform them routinely as part of their job assignment. When non-routine tasks involve hazardous chemicals, workers must be warned of potential hazards and must utilize the corresponding safety equipment and clothing necessary to protect themselves (Appendix V, page 32). All records of training conducted should be logged as appendices to the company procedures manual (see example on page 27).

Training of Company Employees

E mployers are required to provide worker training (either product- or hazard-specific) on the Hazard Communication Standard and the safe use of hazardous chemicals (Appendix VI, page 33). Worker training must provide

 information on how and where to access the written hazard communication program;

instruction on how to use the hazard communication program;

locations where hazardous chemicals are present;

• detection methods to determine the presence or release of a hazardous chemical in the work area;

 an overview of potential hazards of chemicals present in the work area;

 employee safety instructions for protection from potential hazards;

- tips on using and understanding pesticide labels;
- instructions on reading and understanding an MSDS.

Those responsible for the training portion of the Hazard Communication Standard must be continually alert to new or additional hazardous chemicals introduced into the workplace. Any chemical added to the hazardous chemical list should be addressed in training prior to use.

Periodically, employees should be asked to retrieve specific MSDS's to make sure they can find them. As a part of the training program, you might ask a series of questions about an MSDS to see if employees can locate and understand the information. The results will reveal the strengths and weaknesses of your hazard communication program, and you may wish to modify your training accordingly.

Document Training Activities

Keep a log on all training programs, including in-house staff training, correspondence courses, certification workshops, and continuing education meetings that employees attend (Appendix VI, page 33). Agendas should be developed for in-house training. A copy of the agenda should be initialed by employees in attendance at the conclusion of each program. The agendas may be logged as appendices to the company procedures manual. See sample training documentation form below.

EXAMPLE: DOCUMENTATION OF EMPLOYEE TRAINING

Location	
Speaker(s)	
	Employees' Initials to Validate Attendance
overed in Training	
	Location Speaker(s)

Outside Contract Employees

orkers not directly employed by a company, but who will be working there (e.g., electricians, truck drivers, subcontractors), must be notified about chemical hazards in the workplace. A work environment where such situations exist is termed a "multi-employer workplace." The hazard communication program must contain information on how these unique employees can access MSDS's, the labeling system, and instructions on essential precautionary measures to protect against hazards under normal operating conditions and in emergencies (Appendix VII, page 34). These requirements apply equally to all employers who operate a multi-employer workplace where hazardous chemicals are present. Individuals should sign a form verifying that they have been informed of the above issues; and these forms should be maintained as appendices to the company procedures manual.

Access to Workers and OSHA Inspectors

The company's written plan, MSDS's, and chemical information lists must be immediately available to workers and OSHA inspectors. Make sure the plan is accessible to all employees—in the main office or general work area—during normal working hours. The availability of this plan and all of the supporting documentation satisfies all right-to-know and right-to-access obligations. See Appendix VIII, page 34.

Employers should have all employees who use information contained in the written plan record in a log attached to the plan their names and the products or types of information they are using. This documentation should be maintained as an appendix to the company procedures manual as documentation of accessibility to those seeking right-toknow information. It also may serve to highlight chemicals of concern for which specific training should be implemented. It is important to maintain the integrity of the system; therefore, a specific individual should be delegated the responsibility for ensuring that the information borrowed is retrieved and refiled appropriately. Workers themselves should not be allowed or required to refile information.

EXCEPTIONS

The Hazard Communication Standard provides specific requirements for *laboratories* handling hazardous chemicals and businesses that store *sealed containers* (e.g., warehouses).

The HCS applies to laboratories only as follows:

• Labels on containers of hazardous chemicals brought into the laboratory must not be removed or defaced.

• Employers need to maintain MSDS's on all hazardous chemicals received into the workplace; MSDS's must be accessible to workers.

• Although training is required, laboratories are exempt from developing a written hazard communication plan.

The HCS applies to businesses that handle only *sealed* containers as follows:

• Marine cargo handling, warehousing, and retail sales are examples of activities which may deal with *sealed containers*.

• Labels on all incoming containers of hazardous chemicals must not to be removed or defaced.

• Employers must maintain MSDS's accompanying incoming containers of hazardous chemicals; all MSDS's must be accessible to workers.

• Employers must obtain MSDS's for all sealed containers of hazardous chemicals received without MSDS's, upon employee request.

• Employees must be trained on what measures to take to protect themselves in the event of a spill or container leak involving a hazardous chemical.

SUMMARY _____

Safety in the workplace is everyone's responsibility. The Hazard Communication Standard provides a mechanism for assuring that every employee who handles pesticides directly, or who may be exposed to them, is made aware of the potential hazards associated with those products. Once trained, employees are better equipped to do their part in maintaining a safe working environment for themselves and their coworkers. Employers and employees should view the Hazard Communication Standard not as a burden but as a tool to promote safety.

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APPENDIX I

Responsibility for Hazard Communication Program

~ Freddie's Pest Control ~ Policy on Compliance with OSHA Hazard Communication Standard

This is to inform employees that Freddie's Pest Control is in compliance with the OSHA Hazard Communication Standard (Title 29 Code of Federal Regulations 1910.1200). TheOSHA Hazard Communication Standard (herein referred to as "the standard") applies to all company operations where there is potential for exposure to hazardous chemicals during normal conditions of use (routine job assignments) or in emergency situations. In compliance with the standard, employee right-to-know information is provided via the following mechanisms: a list of hazardous chemicals; accessible material data safety sheets; labeled containers; and instruction on proper handling procedures for hazardous chemicals. Workers will be informed of hazards associated with non-routine tasks. The responsibility for implementing the program outlined in this document has been assigned to (name of person). Copies of the program and attachments may be reviewed in the main office.

(Also see page 21 of text.)

APPENDIX II

Hazardous Chemicals List

~ Freddie's Pest Control ~ Policy on Compliance with OSHA Hazard Communication Standard

Freddie's Pest Control has available to all employees a hazar dous chemical list identifying (by brand name) all hazar dous chemicals used by the company. The list is maintained by (name of person) and may be accessed in the main office.

(Also see page 23 of text.)

APPENDIX III

MSDS's for Chemicals on Hazardous Chemical List

~ Freddie's Pest Control ~ Policy on Material Safety Data Sheets for Hazardous Chemicals

Material safety data sheets for all hazardous chemicals used by Freddie's Pest Control are on file in the main office. Employees must read and understand those pertinent to their job and are encouraged to re-read them periodically to stay current.

Also located in the main office is a binder containing a hazardous chemicals list. The responsibility for acquiring MSDS's on all hazardous chemicals used by this company has been assigned to Fred Whitford. MSDS acquisitions are accomplished through manufacturers and vendors from whom the products are purchased.

(Also see page 24 of text.)

APPENDIX IV

Labels and Other Forms of Warning

~ Freddie's Pest Control ~ Policy on Labels and Other Forms of Warning

All hazardous chemicals at this facility must be properly labeled. Labels shall list at least the chemical identity, appropriate hazard warnings, and the name and address of the manufacturer.

If multiple stationary containers in the work area contain similar chemicals with similar hazard potential, signs must be posted to convey their common hazard information. If chemicals are transferred from labeled containers to portable ones intended for immediate use, no labels are required on the portable containers.

(Also see page 25 of text.)

APPENDIX V

Non-Routine Tasks

~ Freddie's Pest Control ~ Policy on Non-Routine Tasks

When employees are required to perform non-routine hazardous tasks (e.g., cleaning tanks, stripping floors, washing out 55-gallon drums with cleansers, entering confined spaces), special training sessions will be conducted to inform them of hazardous chemicals to which they may be exposed. The training also will address the implementation of proper precautions to reduce or avoid exposure.

APPENDIX VI

Training of Company Employees



APPENDIX VII

Outside Contract Employees

~ Freddie's Pest Control ~ Policy on Outside Contract Employees

The provisions of the standard dealing with multi-employer workplaces includes contractors. As multi-employer workers, outside contractors must be notified of any chemical hazards that they may encounter in their normal course of work on the premises. Notification includes information on the labeling system in use, protective measures to be taken, and safe handling procedures. Individuals must be notified of the location and availability of MSDS's. Each contractor bringing chemicals on-site must provide the corresponding hazard information, including labels and precautionary measures.

(Also see page 28 of text.)

APPENDIX VIII

Access to Workers and OSHA Inspectors

~ Freddie's Pest Control ~ Policy on Access to Information

All employees and OSHA inspectors can obtain further information on this written program, the Hazard Communication Standard, applicable MSDS's, and chemical information lists in the main office.

(Also see page 28 of text.)

REVIEWED: 5/01

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