Guide to the California Hazard Communication – Regulation





Department of Industrial Relations Cal/OSHA Consultation Service Education Unit

Guide to the California Hazard Communication Regulation

This guide is not meant to be substitute for—or a legal interpretation of—the occupational safety and health standards. The reader is cautioned to refer directly to the *California Code* of *Regulations*, *Title 8*, or the *Labor Code* for detailed and exact information, specifications, and exceptions.



Publishing Information

The Guide to the California Hazard Communication Regulation was developed by the Education Unit, Cal/OSHA Consultation Service, California Department of Industrial Relations. The document was prepared for publication by the staff of CDE Press, California Department of Education. It was distributed under the provisions of the Library Distribution Act and *Government Code* Section 11096.

Published 2000 by the California Department of Industrial Relations

Contents

| Abo | ut This Guide iv |
|------|---|
| Wh | at's in It for Me1 |
| Reg | ulatory Requirements 2 |
| Sum | mary of California's Hazard Communication Regulation |
| I. | Scope |
| II. | Hazard Determination |
| III. | Material Safety Data Sheets (MSDSs)7 |
| IV. | Labels and Other Forms of Warning9 |
| V. | Written Hazard Communication Program 11 |
| VI. | Employee Information and Training 13 |
| VII. | Trade Secret Protection 14 |
| Atta | achments |
| А. | Hazard Communication Program: Step by Step 16 |
| В. | Written Hazard Communication Program Sample 17 |
| C. | Hazardous Substance Inventory List Sample 21 |
| D. | Hazard Communication Employee Training Program Sample |
| E. | MSDS Request Letter Sample |
| F. | MSDS Sample |
| Reso | ources |
| Eval | uation |
| Ack | nowledgments |
| Cal/ | OSHA Consultation Service Offices |



About This Guide

E very day at workplaces throughout California, employees work with or are incidentally exposed to hazardous substances that can harm their health or cause safety hazards. This guide is designed to help employers and employees understand the requirements of the hazard communication regulation by providing a simplified and clear overview of the major program elements.

For easy reference, this guide is separated into seven main sections:

- **I. Scope,** which explains what employers and what types of substances are subject to the regulation, as well as the exemptions from the regulation
- **II. Hazard Determination,** which explains how responsible parties can determine which specific substances are hazardous
- **III.** Material Safety Data Sheets (MSDSs), which explains what an MSDS is, what categories it must include, and how this information can be used to educate employees on the hazards of chemicals
- **IV.** Labels and Other Forms of Warning, which explains labeling requirements and the importance of implementing a visual warning system that will quickly and effectively alert employees to potentially dangerous chemicals and situations
- V. Written Hazard Communication Program, which explains all the requirements of such a program
- VI. Employee Information and Training, which addresses employers' responsibilities for making sure that their employees are trained—prior to starting work—on the safe handling of hazardous substances they are or may be exposed to in their jobs and on the ways in which they can protect themselves from those hazards
- VII. Trade Secret Protection, which addresses how manufacturers may comply with the regulation without revealing the specifics of a chemical compound

At the back of this guide, there are six attachments intended to further assist employers in setting up or improving an existing hazard communication program. Attachments A through D are samples of various elements of an effective written program. The basic format can be tailored to reflect your individual work site and the chemical substances found there. Attachments E and F relate to MSDS forms—how to request one from the manufacturer and what the appropriate form should look like.

Whatever the size of the facility or number of chemical hazards, it is essential that both employers and employees know how to identify potentially hazardous substances, understand the health hazards associated with these chemicals, and follow safe work practices. Every workplace which has or uses hazardous substances must have a written and effectively implemented hazard communication program that specifically addresses the potential hazards found at that particular site.

What's in It for Me?

E mployers benefit from having an effective hazard communication program because it helps them:

- Identify and control hazardous substances present in their workplaces.
- Develop or rethink safe and efficient strategies for the use, handling, and disposal of these substances.
- Promote safe and effective work practices.
- Reduce workers' compensation losses.
- Comply with the law.

All these elements ultimately save money and increase employee morale and productivity.

Employees also benefit from a hazard communication program because they learn how to identify potentially hazardous chemicals to which they may be exposed in the workplace. This increased awareness promotes the greater likelihood that employees will:

- Reduce their exposure to hazardous substances.
- Follow safer work practices.
- Protect themselves, thereby preventing work-related injuries and illnesses.

Medical personnel, such as physicians, nurses, and other health care professionals, can best treat injured workers when they have complete background information on the substances to which an injured worker was exposed.

Emergency responders, such as firefighters and police, benefit because:

- An effective response strategy depends on advance knowledge of the chemical(s) involved in a fire or chemical spill.
- They can better protect themselves, thereby reducing the likelihood of work-related injuries and illnesses.

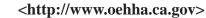


Regulatory Requirements

Under the California *Labor Code* and the California Occupational Safety and Health Act, all employers in California are legally obligated to provide and maintain a safe and healthful workplace for employees.

The hazard communication regulation emphasizes workplace safety and requires employers to inform their employees of the hazardous substances to which they are exposed at the job site. Requirements for developing, implementing, and maintaining a hazard communication program are found in Title 8 of the *California Code of Regulations* (T8 CCR), Section 5194. Subsection 5194(b)(6) contains the Safe Drinking Water and Toxic Enforcement Act (Proposition 65), which was added to the original hazard communication regulation in 1991.

Proposition 65 requires the governor to publish a list of chemicals known to the State of California to cause cancer, birth defects, or reproductive harm. Proposition 65 also requires that businesses provide a clear and reasonable warning before knowingly and intentionally exposing anyone to a listed chemical. An overview of Proposition 65 as it relates to the hazard communication regulation is noted throughout this guide. For complete details on the Proposition 65 regulation, please refer to T22 CCR, Section 12000 et seq., or contact the Office of Environmental Health Hazard Assessment (OEHHA) Web site:



Compliance with Proposition 65 requirements for notifying employees of hazards can be achieved simply by complying with the provisions of California's hazard communication regulation.

For a free copy of the hazard communication regulation or more information on its requirements, or if you wish to request free professional assistance with your hazard communication program, please call the nearest Cal/OSHA Consultation office listed on the last page of this guide. The hazard communication regulation can also be accessed through the Department of Industrial Relations Web site for Cal/OSHA Standards, *California Code of Regulations, Title 8:*

<http://www.dir.ca.gov/samples/search/query.htm>



Summary of California's Hazard Communication -Regulation

- I. Scope
- II. Hazard Determination
- III. Material Safety Data Sheets (MSDSs)
- IV. Labels and Other Forms of Warning
- V. Written Hazard Communication Program
- VI. Employee Information and Training
- VII. Trade Secret Protection



I. Scope (T8 CCR 5194[b])

This section explains who is subject to the California Hazard Communication Regulation and what conditions must be present in order to be exempt from the regulation.

Application

Except for the exemptions and exclusions noted below, the hazard communication regulation applies to:

A. All California employers—regardless of size—whose employees may be exposed to hazardous substances



applies to all businesses except:

- · Companies employing fewer than ten employees
- Any government agency
- All public water systems
- B. All hazardous substances found in the workplace under normal conditions of use as well as in reasonably foreseeable emergency conditions (i.e., a spill or release of a flammable chemical)



applies only to:

 The specified list of chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. These listed chemicals may be naturally occurring or synthetic, used as ingredients in materials and products, and/or generated as byproducts, emissions, and waste.

Exemptions



- Chemicals in closed containers. Although operations in which employees handle hazardous substances only in sealed containers (e.g., warehouse, transportation, or retail sales) are exempt from the full standard, employers are still required to:
 - Ensure that labels on incoming containers are not removed or defaced.
 - Obtain and maintain Material Safety Data Sheets (MSDSs) and make them readily accessible to employees in their work area(s) during each work shift.

- Train employees so they know how to handle and protect themselves in the event of a chemical spill or a leak from a sealed container.
- 2. *Laboratories*. Employers who engage in the laboratory use of hazardous chemicals are exempt from the hazard communication regulation if they meet **all** of the following conditions:
 - Chemical manipulations are carried out on a "laboratory scale"—a single person using small quantities of hazardous chemicals in procedures that are not part of a production process, nor in any way simulate a production process; and
 - Multiple chemicals or chemical procedures are used; and
 - Protective laboratory practices and equipment are available and in common use industry-wide to minimize the potential for employee exposure to hazardous chemicals.

These employers are, however, subject to T8 CCR, Section 5191, "Occupational Exposure to Hazardous Chemicals in Laboratories."



warnings do not apply to:

- An exposure for which federal law preempts state authority
- An exposure that takes place less than twelve months from the time the chemical was officially listed in T22 CCR, Section 12000, "Chemicals Known to the State to Cause Cancer or Reproductive Toxicity"
- An exposure for which the employer can show that:
 - a. The exposure of a given chemical from the list of carcinogens poses no significant cancer risk, assuming lifetime exposure at the level in question; and
 - b. The exposure of a given chemical from the list of reproductive toxicants will have no observable effect, assuming exposure at one thousand (1,000) times the level in question.

Exclusions

The following are excluded from the hazard communication regulation:

- Hazardous wastes regulated by the EPA
- Tobacco products
- Natural wood or chemically untreated wood products for retail sale
- Manufactured items—articles that are handled/processed in a way that does not result in employee exposure via inhalation, ingestion, or skin absorption, such as items for immediate use or retail sale
- Food, drugs, and cosmetics consumed or used by the employees on the job site



5

- Retail trade establishments, except for processing and repair work areas
- Pesticide use regulated by the California Department of Food and Agriculture
- Consumer products, unless quantities used or exposures are greater than ordinary home consumer quantities or exposures

II. Hazard Determination (T8 CCR 5194[d])

M anufacturers, distributors (if they repackage and sell under their own label), and importers are required to assess the physical and health hazards associated with the substances they produce or repackage. They are also required to provide hazard information to employers by means of labels and MSDSs. From the MSDSs and sources listed below, employers can find out whether substances to which employees are exposed at the workplace are hazardous and, therefore, subject to the hazard communication regulation.



Note

California employers must determine whether any of the hazardous chemicals from their chemical inventory are subject to Proposition 65 requirements. To obtain this updated list of chemicals, please call OEHHA at (916) 445-6900; access the OEHHA Web site <http://www.oehha.ca.gov>; or subscribe to Division 2 of Title 22, *California Code of Regulations*, beginning with Section 12000, from Barclays Law Publishers.

- A "hazardous substance" includes:
- A. Any hazardous substances listed in:
 - 1. *The Hazardous Substances List* (T8 CCR, Section 339), commonly known as "The Director's List of Hazardous Substances"
 - 29, Code of Federal Regulations (CFR), Part 1910, Subpart Z, "Toxic and Hazardous Substances," Occupational Safety and Health Administration (federal OSHA); and T8 CCR, Section 5155, "Air Contaminants"
 - Threshold Limit Values for Chemical Substances in the Work Environment, American Conference of Governmental Industrial Hygienists (ACGIH), 1991–1992
 - 4. Sixth Annual Report on Carcinogens, National Toxicology Program (NTP), 1991
 - 5. *Monographs*, International Agency for Research on Cancer (IARC), Vols. 1–53 and Supplements 1–8. World Health Organization

- 6. *Material Safety Data Sheets* as reproductive toxicants or cancerproducing substances
- 7. T22 CCR, Section 12000, under the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), "Chemicals Known to the State to Cause Cancer or Reproductive Toxicity," a list published at least once a year by Cal/EPA's Office of Environmental Health Hazard Assessment
- B. Any other substances that present a physical or health hazard as determined by scientific evidence.

III. Material Safety Data Sheets (MSDSs) (T8 CCR 5194[g])

O n each hazardous chemical, MSDSs provide information such as health hazards, special chemical and physical characteristics, protective measures, precautions for safe handling, use and storage of each chemical. Employers can use the information contained in MSDSs to educate employees on hazards associated with chemicals found in their workplace.

Because information contained in MSDSs can change, employers must review the MSDSs and ensure that employees are provided with the most current version. Also make sure that employees have ready access to MSDSs and are trained to understand the information (please see Attachment F, "MSDS Sample").

All parties should be aware of the following information:

- A. Manufacturers, importers, or other responsible parties who prepare MSDSs are required to develop an MSDS for every hazardous substance or mixture they produce or import.
- B. The MSDS must encompass **all** of the following categories. If there is no relevant information for a given category, or a category does not apply to the chemical in question, the MSDS must indicate that no information is applicable. Mandatory items are:
 - For a single hazardous substance, the substance identity used on the label, *the chemical name, the common name, and the Chemical Abstracts Service (CAS) number* of the hazardous substance.

For a hazardous mixture tested as a whole, all of the elements listed above for each hazardous ingredient and the common name of the mixture itself.

For a hazardous mixture not tested as a whole, the chemical name, the common name, and the CAS number of all hazardous ingredients that compose 1 percent or greater of the mixture and carcinogens that are present in concentrations of 0.1 percent or greater. Refer to T8 CCR, 5194 (g)(2)(A)3 for full details.



The names used on the MSDS must allow for cross-referencing with the name that appears on the product label and on the inventory list of hazardous substances in the workplace.

- *Physical and chemical properties,* such as vapor pressure, flash point, and solubility of the chemical(s).
- *Physical hazards*, such as fire, explosion, or dangerous chemical reactions.
- *Health hazards*, including signs and symptoms of exposure, ranging from minor skin irritation to death. This section must also include any medical condition that could be made worse by exposure to the substance. These health effects can be acute (short-term) or chronic (long-term).
- *Potential routes of entry* of the hazardous substance into the body.
- Permissible exposure limits for hazardous substances. These are the legally required OSHA Permissible Exposure Limits (PELs), the recommended American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), and any other limits recommended by the manufacturer, importer, or employer preparing the MSDS. Be aware that PELs listed on MSDSs are based on federal PELs; California PELs may be more stringent.
- Information on whether the hazardous substance is listed as a *carcinogen* by the National Toxicology Program (NTP), the International Agency of Research on Cancer (IARC), or the Occupational Safety and Health Administration (OSHA).
- *Precautions for safe handling, use, and storage,* including protective measures that should be taken prior to repair and maintenance of equipment and cleanup procedures for spills and leaks.
- *Known control measures,* including engineering, work practices, and personal protective equipment needed to protect employees from danger.
- *Emergency and first aid* procedures.
- *Date* of MSDS preparation or date of last change in contents.
- *Name, address, and phone number* of the party responsible for preparing the MSDS who could, if necessary, provide additional information, including emergency procedures on the hazardous substance in question.
- C. MSDS preparers are required to update the MSDS within three months of learning new hazard data and/or ways to protect against the hazards.
- D. Chemical manufacturers and importers of hazardous substances are required to provide an MSDS with each initial shipment and whenever an MSDS is updated. Distributors are required to provide MSDSs and MSDS updates to all purchasers of hazardous substances.





- E. Employers must have an MSDS for every hazardous chemical in the workplace. If the delivered MSDS is missing any of the mandatory items, or if no MSDS is delivered with the substance, the employer must write asking the manufacturer or distributor for an MSDS containing all mandatory items.
- F. Employers are also responsible for keeping MSDSs current and making them accessible to employees in their work area(s) during each work shift.
- G. Businesses that have multiple workplaces to which employees travel must keep MSDSs at a primary central location and must establish a mechanism to ensure that employees can immediately obtain the required information in an emergency.
- H. If you have a specific question or need additional information on an MSDS, please call the Cal/OSHA Consultation Service at 1-800-963-9424 or HESIS of the Occupational Health Branch at 510-622-4317 (English).
- If you are unable to obtain the MSDS from the vendor within 25 calendar days of the request, please call your local Cal/OSHA compliance office or write to:

Division of Occupational Safety and Health Deputy Chief of Health and Engineering Services P. O. Box 420603 San Francisco, CA 94142-0603

MATERIAL SAFETY DATA SHEETS

IV. Labels and Other Forms of Warning (T8 CCR 5194[f])

E mployers are required to use **legible** labels and other forms of warning to clearly and quickly communicate the identity and hazard(s) of chemicals in the workplace. Labels and other forms of warning are to be conspicuously placed on containers so that the message is readily visible. If a business employs a large number of non-English-speaking employees, employers are required to use symbols, warning signs in English and other languages, or any other means necessary to ensure that their employees understand the dangers present in the workplace.

Affected parties should be aware of the following information:

- A. When the employer receives hazardous substance containers, the supplier's original containers must be labeled with the following information:
 - 1. Identity of the hazardous substance, which must allow for crossreferencing with the MSDS and the inventory list of hazardous substances in the workplace



- 2. Hazard warning statements, including Proposition 65 warnings if applicable
- 3. Name and address of the chemical manufacturer, importer, or other responsible party

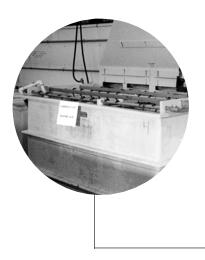
Note

Hazardous substance containers from out-of-state chemical manufacturers or distributors (who are not subject to Proposition 65) may not have Proposition 65 hazard warnings. California's suppliers/employers must meet the requirement in various ways, including affixing additional Proposition 65 warning labels on containers or posting signs in the workplace.

- B. If during the course of work hazardous substances are transferred from the original container to a secondary portable container, the employer needs to ensure that the secondary container is labeled with the following information:
 - 1. Identity of the hazardous substance
 - 2. Hazard warning statements, including Proposition 65 warnings if applicable

Note: Portable containers for immediate use during a single shift by a single employee who performs the transfer himself/herself are exempt from the labeling requirement under California's Hazard Communication Regulation.

- C. On individual stationary process containers—such as plating tanks employers can use signs, placards, and other options in lieu of labels as long as the required information listed above is included.
- D. Employers must relabel containers whenever labels are damaged or defaced.
- E. Additional labeling requirements apply for specific chemicals listed under the substance-specific health standards as referenced in T8 CCR, Article 110, "Regulated Carcinogens" (all sections under this Article).
- F. Above-ground pipes transporting hazardous substances (gases, vapors, liquids, semi-liquids, or plastics) shall be identified in accordance with T8 CCR, Section 3321, "Identification of Piping."



Note

The Right to Know warning requirement mandates that a clear and reasonable warning be given to all individuals **prior** to exposure to any listed chemical that can cause cancer, birth defects, or other reproductive harm. Businesses that have one or more of the listed chemicals in the workplace as an ingredient in a material they use, a product they manufacture, and/or an emission into the environment **must provide a clear and reasonable warning**, unless they can prove that the exposure causes no significant risk.

The language in the warning must clearly state that the chemical in question is known to cause cancer, birth defects, or other reproductive harm. The warning must be given so that it effectively reaches the person before he/she is exposed.

Under Proposition 65, warnings are required for:

- 1. Consumer product exposures
- 2. Occupational exposures
- 3. Environmental exposures

Warnings for exposure in the workplace can be communicated by one or a combination of the following:

- 1. A warning on a product label
- 2. A warning or sign posted conspicuously in the workplace
- A warning that complies with the federal OSHA "Hazard Communication Regulation" (29 CFR, Section 1910.1200), the California "Hazard Communication Regulation" (T8 CCR, Section 5194), the "Pesticides and Worker Safety Requirements" (T3 CCR, Ch. 6, Subch. 3, Group 3, Section 6700)

V. Written Hazard Communication Program (T8 CCR 5194[e])

E mployers whose employees may be exposed to hazardous substances are required to have a written hazard communication program that addresses all the requirements of the regulation. Employers who tailor a written program to meet the specific needs of their workplace will maximize the benefits of workplace safety.

A written hazard communication program must describe the procedures for meeting all the requirements of the regulation, including:

A. Developing and maintaining a list of the hazardous substances in the workplace. This list may be compiled for the workplace as a whole or for

individual work areas and can serve as a checklist to ensure that all hazardous substances in the workplace have MSDSs and labels.

Note

Establish an ongoing system to obtain the updated Proposition 65 list of chemicals. For chemicals that are newly added, warning requirements apply 12 months from the effective date of listing.

- B. An explanation of how the employer will meet requirements for:
 - 1. Labeling of containers of hazardous substances and other forms of warning
 - 2. MSDSs and making sure they are readily accessible to employees and emergency responders
 - 3. Employee training on hazardous substances they are or may be exposed to in their particular jobs during routine/nonroutine work, or emergency situations
- C. A plan of how multi-employer workplace issues, if applicable, will be addressed:
 - 1. How an employer will inform a contractor—whose employees work in the employer's workplace-of the hazardous substances to which the contractor's employees may be exposed while performing their work, and how the employer's employees will be protected from hazardous substances brought into the workplace by the contractor's employees. If the hazardous substances include Proposition 65 chemicals, clear and reasonable warnings must be provided to all employees, from either the employer or the contractor, prior to exposure.
 - 2. How the employer will inform other employers of precautionary measures needed to protect employees during normal work as well as emergency conditions.
 - 3. How the employer will inform other employers of the labeling system in the workplace.
- D. A plan for the periodic (e.g., annual) evaluation of program effectiveness and plans for updating the program, if necessary.

Note: The written hazard communication program must be available upon request to employees, their representatives, Cal/OSHA representatives, and others in accordance with Section 3204(e), "Access to Employee Exposure and Medical Records."



VI. Employee Information and Training (T8 CCR 5194[h])

E mployee training is an integral part of the hazard communication program and must be provided at the time of initial assignment, whenever a new hazard is introduced into the workplace, and when employees may be exposed to other employers' workplace hazards. Employees need to know ahead of time the identity and hazards of all chemicals to which they may be exposed, including chemicals listed under Proposition 65. Once they have this knowledge, they will understand the need to protect themselves and are more likely to observe the company's safety rules.

Employee training on new or revised MSDS information must be provided within 30 days of the employer receiving that information. All training materials used must be appropriate in both content and vocabulary for the educational level, literacy level, and language comprehension level of the employees. Employees must be given an opportunity to ask questions of the person(s) conducting the training. Although not required, periodic refresher training in addition to the initial training is beneficial and encouraged.

Videotapes may be used to **supplement** your training; however, videos alone are not an acceptable substitute for training.

The Cal/OSHA Consultation Service is also available to answer health and safety concerns you may have, including questions on personal protective equipment (PPE). Refer to the list on the back cover of this guide to find the phone number of the Cal/OSHA Consultation Office nearest you.

Information and training must include:

- 1. Requirements of the hazard communication regulation, including employee rights (e.g., employees receiving and sharing with their physician information on hazardous chemicals to which they may be exposed)
- 2. Information about the location and availability of the employer's written hazard communication program
- 3. Identification of any operation in the employee work area where hazardous substances are present
- 4. Information on how to obtain, read, and understand MSDSs and labels, including data on the physical and health hazards of the substances
- 5. How to detect the presence or release of hazardous substances (e.g., appearance and odor)



6. Protective measures to be used, such as work practices, personal protective equipment, and emergency procedures

Note: T8 CCR, Section 3203(b)(1), "Injury and Illness Prevention Program," requires that employee training be documented and records retained for at least one year.



VII. Trade Secret Protection (T8 CCR 5194[i])

U nder the trade secret provision, manufacturers, importers, or employers who wish to withhold the specific identity of a hazardous chemical from the MSDS **must meet all the specific requirements of T8 CCR**, Section 5194(i), including:

- A. The MSDS must state that the specific identity of the chemical mixture is being withheld as a trade secret. All other MSDS categories must be addressed.
- B. Trade secret information must be released in certain circumstances. Information on the specific chemical identity of a trade secret substance may be requested in medical emergencies as well as in non-emergency situations.

In the case of a medical emergency, the chemical identity must be immediately disclosed to medical personnel. In non-emergency situations, disclosure shall be made to health or safety professionals and to employees and their designated representatives upon a written request, which

- Explains why the disclosure of the specific chemical identity is essential, and
- Describes the procedures by which the disclosed information will be kept confidential.

Note: A trade secret cannot include chemical identity information that is already discoverable through laboratory qualitative analysis. Refer to T8 CCR, Section 5194(i), for complete information on conditions for releasing a trade secret and for holding the information confidential.

Throughout industry, the risks of chemical exposure are real and often, a component of every workday. For these reasons, it is Cal/OSHA's aim to increase awareness of chemical hazards and thereby contribute to greater workplace health and safety.

In addition to a safer workplace, employers should consider—in today's highly competitive business climate—the rewards that a sound hazard communication program can provide. Any workplace would welcome such benefits as enhanced chemical inventory control, safer chemical processes, reduced workers compensation premiums, and reduced waste and disposal costs.

It takes time and effort to set up and maintain a successful hazard communication program. However, it is critically important for both employers and employees to collaborate in its implementation and maintenance. It is like a safety net that can help prevent injuries, illnesses, and accidents while protecting your workers and your business and saving you money.

Remember—it is required by law, but it is also good business practice.

Attachment A

Hazard Communication Program: Step by Step

| Step 1 | Read this guide for an overview of the regulation. |
|--------|---|
| Step 2 | Read the Hazard Communication Regulation, Title 8, <i>California Code of Regulations</i> , Section 5194. |
| Step 3 | Designate staff responsible for developing, implementing, and monitoring the hazard communication program. |
| Step 4 | Develop and maintain a current inventory of all hazardous substances to which employees may be exposed. |
| Step 5 | Collect current Material Safety Data Sheets (MSDSs) for all hazardous sub- stances listed on the workplace inventory prepared in Step 4. |
| Step 6 | Check original and secondary containers to ensure they are properly labeled. Include Proposition 65 warning requirements if applicable. |
| Step 7 | Develop a plan for your written hazard communication program. Put into writing how you are implementing the program (see Attachment B, "Written Hazard Communication Program Sample"). |
| Step 8 | Train employees on the Hazard Communication Regulation and on the hazard-ous substances that may be found on your work site. This training must include, but is not limited to: What MSDSs are and how to interpret them Proper labeling procedures Employee protective measures Signs and symptoms of excessive exposure |
| Step 9 | Keep your written hazard communication program current by ensuring that: New employees are trained. Employees are retrained whenever new hazardous substances are introduced into the workplace. New chemicals are received with proper labels and MSDSs, and secondary containers are also properly labeled. Contractors' issues are addressed. Your employees could be exposed to new chemicals brought onto the site by the contractor's employees, or the contractor's employees could be unfamiliar with the chemicals already on your site. |

Attachment B

Written Hazard Communication Program Sample

for XYZ COMPANY

This is an example only. Employers are encouraged to develop their own program, specifically tailored to their operation and needs.

To enhance our employees' health and safety, our company has developed, implemented, and maintains a hazard communication program as required by the Hazard Communication Regulation (T8 CCR 5194). The hazard communication manager, *(name)*, has full authority and responsibility for implementing and maintaining this program. We provide information about the hazardous substances in our workplace, the associated hazards, and the control of these hazards through a comprehensive hazard communication program that includes the elements listed below.

1. List of hazardous substances

(*Person/position*) will prepare and keep current an inventory list of all known hazardous substances present in our workplace. Specific information on each noted hazardous substance can be obtained by reviewing the MSDSs (see Attachment C, "Hazardous Substance Inventory List Sample").

2. Propostion 65 list of chemicals

(*Person/position*) is responsible for obtaining updates of Proposition 65 listed chemicals and providing new information to affected employees. In the case of newly added chemicals to the Proposition 65 list, warning requirements take effect 12 months from the date of listing.

3. Material Safety Data Sheets (MSDSs)

(*Person/position*) is responsible for obtaining the MSDSs, reviewing them for completeness, and maintaining the data sheet system for our company. In the review of incoming data sheets, if new and significant health/safety information becomes available, this new information is passed on **immediately** to the affected employees by additional training sessions, posting of memos, and other means of communication.

Legible MSDS copies for all hazardous substances to which employees of this company may be exposed are kept in *(list all locations)*. MSDSs are readily available for review to all employees in their work area and during each work shift. If MSDSs are missing or new hazardous substance(s) in use do not have MSDSs, or if an MSDS is obviously incomplete, please contact *(person/position)* immediately, and a new MSDS will be requested from the manufacturer. If we are unable to obtain the MSDS from the vendor within 25 calendar days of the request, we will either call our local Cal/OSHA compliance office or write to:

Division of Occupational Safety and Health Deputy Chief of Health and Engineering Services P. O. Box 420603 San Francisco, CA 94142-0603 If anyone has a specific question or needs additional information on an MSDS, please call the Cal/OSHA Consultation Service at 1-800-963-9424 or HESIS of the Occupational Health Branch of at 510-622-4317.

If we use alternatives other than paper MSDSs—computer or microfiche machines with printers or telefax machines—we will make sure that employees have ready access to and know how to operate these devices for retrieval and printing of legible hard copies. Our backup system in the event of failure of the primary MSDS retrieval system will require employees to request paper MSDSs by telephone. An MSDS hard copy will be provided to the requester as soon as possible after the telephone request is made.

4. Labels and other forms of warning

Before hazardous substance containers are released to the work area, it is the policy of our company that *(person/position)* will verify that all primary and secondary containers are labeled as follows:

| Label Information | Primary Container | Secondary Container |
|--|-------------------|---------------------|
| Identity of the hazardous substance(s) | V | ~ |
| Applicable hazard warnings | v | ~ |
| Name and address of the manufacturer | ~ | |

To address exposures to Proposition 65 chemicals, (*person/position*) will provide clear and reasonable warnings to individuals prior to exposure by means of posting signs conspicuously, labeling consumer products, and training employees.

If applicable, (*person/position*) will arrange for labels, signs, and other warnings to be printed in other languages.

5. Employee information and training

Employees are to attend a health and safety training session set up by (*person/position*) prior to starting work. This training session will provide information on the following:

- The requirements of the hazard communication regulation, including the employees' rights under the regulation
- The location and availability of the written hazard communication program
- Any operation in their work area, including nonroutine tasks, where hazardous substances or Proposition 65 carcinogens/reproductive toxins are present and exposures are likely to occur
- Methods and observation techniques used to determine the presence or release of hazardous substances in the work area
- Protective practices the company has taken to minimize or prevent exposure to these substances
- How to read labels and review MSDSs to obtain hazard information
- Physical and health effects of the hazardous substances

- Symptoms of overexposure
- Measures employees need to put into practice to reduce or prevent exposure to these hazardous substances by engineering controls, work practices, and use of personal protective equipment
- Emergency and first-aid procedures to follow if employees are exposed to hazardous substances
- The location and interpretation, if needed, of warning signs or placards to communicate that a chemical known to cause cancer or reproductive toxicity is used in the workplace

Employees will receive additional training when a new hazard is introduced into the workplace or whenever employees might be exposed to hazards at another employer's work site.

6. Hazardous nonroutine tasks

Periodically, our employees are required to perform hazardous nonroutine tasks. Prior to starting work on such projects, affected employees will be given information by their supervisor on hazards to which they may be exposed during such an activity.

This information will cover:

- Specific hazards
- Measures the company has taken to reduce the risk of these hazards, such as providing ventilation, ensuring the presence of another employee, providing a respiratory protection program, and establishing emergency procedures
- Required protective/safety measures

Examples of nonroutine tasks performed by employees of this company:

7. Labeled/unlabeled pipes (if applicable)

Above-ground pipes transporting hazardous substances (gases, vapors, liquids, semi-liquids, or plastics) shall be identified in accordance with T8 CCR, Section 3321, "Identification of Piping."

Other above-ground pipes that do not contain hazardous substances but may have associated hazards if disturbed or cut (e.g., steam lines, oxygen lines) shall be addressed as follows:

Before employees enter the area and initiate work, (persons/position) will inform them of:

- The location of the pipe or piping system or other known safety hazard
- The substance in the pipe
- Potential hazards
- Safety precautions

8. Informing contractors

To ensure that outside contractors work safely in our plant and to protect our employees from chemicals used by outside contractors, (*person/position/department*) is responsible for giving and receiving the following information from contractors:

- Hazardous substances, including Proposition 65 chemicals, to which they may be exposed while on the job site as well as substances they will be bringing into the workplace (To this end, we will provide contractors with information on our labeling system and access to MSDSs.)
- Precautions and protective measures the employees may take to minimize the possibility of exposure

If anyone has questions about this plan, please contact (*person/position*). Our plan will be maintained by (*person/position*) to ensure that the policies are carried out and the plan is effective.

(Signature of Owner or Management Representative)

Attachment C

Hazardous Substance Inventory List Sample

| Hazardous Substance | Operation/Work Area | MSDS |
|---------------------|-----------------------------|------------|
| Trichloroethylene | Degreaser – Finish Dept. | Complete |
| Muriatic Acid | Metal Stripper – Prep Dept. | Incomplete |
| Acetone | Manufacturing Area | Complete |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Attachment D

Hazard Communication Employee Training Program Sample

COMPANY: _____ DATE: _____

DEPARTMENT: _____

We have developed a training program to increase employee awareness of hazardous substances in our workplace and to motivate employees to protect themselves. The training program is based on the types of hazardous substances used at the work site and the associated hazards.

Overview of Hazard Communication Regulation

The hazard communication regulation is intended to ensure that both employers and employees understand the dangers associated with hazardous substances in the workplace. The following information is a review of the specific requirements of a hazard communication program, including container labeling, MSDSs, and training.

Written Hazard Communication Program

We have a written program that outlines how we provide information on and control your exposure to hazardous substances. This plan is available to you during our training or during your work shift from (*person*) at (*location*).

Hazardous Substances Used in Our Workplace

In our shop we use a variety of chemical products. Most of these products contain one or more hazardous substances. Let's review the hazardous substance inventory list in your work area. For specific hazard information on each brand of material, review the MATERIAL SAFETY DATA SHEETS (MSDSs) and, if applicable, the Proposition 65 list of chemicals.

Reading Labels, Warnings, and MSDSs

Labels. A product label on both the original and secondary containers should be read before working with the material. Each label has two important pieces of information:

- 1. Identity of the hazardous substance
- 2. Hazard warnings

The label on the original container also gives the name and address of the manufacturer.

The label should act as a visual reminder of the information we have presented in this training session and of the detailed information on the MSDS.

Proposition 65 warnings. These are provided to you prior to exposure in the form of labels, placards, employee training, and the like so that you know that certain chemicals in your workplace are known to the state to cause cancer, birth defects, or other reproductive harm.

It is essential to your safety that you read the hazard warning and use the hazardous substances only within the prescribed guidelines. Questions concerning any of the warning message(s) should be directed to your supervisor or foreman.

Material Safety Data Sheets (MSDSs). Manufacturers and importers are responsible for providing us with adequate information for using the hazardous substances safely. We use MSDSs as the primary source for informing you about the hazards of the substances in our plant. MSDSs are kept at (*location*) and are readily available to you in every shift.

You will be trained on the specific hazards of the substances in **your** work area. You will also be trained on how to read the information in the MSDSs. The information includes:

- 1. Chemical and physical properties of hazardous substances, such as vapor pressure or specific gravity
- 2. Physical hazards of the chemicals, such as flammability or reactivity
- 3. Health hazards of the hazardous substances, such as signs and symptoms of exposure
- 4. Routes of entry
- 5. Protective measures, such as work practices, engineering controls, and use of personal protective equipment
- 6. Methods to detect the release of a hazardous substance in the work area
- 7. Emergency and first-aid procedures

You can read the California Hazard Communication Regulation for additional information on any specific program element.

Attachment E MSDS Request Letter Sample

Date: _____

Chemical Company or Distributor:

RE: MSDS for (*product[s]*)

Please send me an up-to-date copy of your Material Safety Data Sheet (MSDS) for the above product. The MSDS is needed for compliance with the State of California Hazard Communication Regulation, Title 8, *California Code of Regulations*, Section 5194.

Please send the MSDS to:

(Name)

(Company name)

(Address)

If this product does not require an MSDS, please notify us in writing.

If you have any questions regarding our request, please contact (name and phone number).

Sincerely,

Firm Representative

Attachment F MSDS Sample

Guide to Understanding MSDSs

This attachment provides information for understanding and interpreting the Material Safety Data Sheet (MSDS). A typical MSDS (for Methyl Ethyl Ketone) is shown and then analyzed section by section to aid in understanding the terms and contents.

Note: The information in this section comes from the California Chamber of Commerce's *Hazard Communication Handbook*, 1997 edition. Used by permission.

Material Safety Data Sheet May be used to comply with OSHA s Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.



U.S. Department of Labor Occupational Safety and Health Administration (Non-Mandatory Form) Form Approved OMB No. 1218-0072

| IDENTITY (As used on Label and List) | Note: Blank spaces are not permitted. If any item is not applicable, or no |
|--------------------------------------|--|
| Methyl Ethyl Ketone (MEK) | information is available, the space must be marked to indicate that. |

| Manufacturer s Name | Emergency Telephone Number | |
|--|--|--|
| XYX Chemical Company | (204) 123-4566 | |
| Address (Number, Street, City, State, and ZIP Code) 111 Main Street | Telephone Number for Information (204) 123-4522 | |
| New York, NY 10012 | Date Prepared January 5, 1990 | |
| | Signature of Preparer (optional) | |
| | John Doe | |

| Hazardous Components (Specific Chemical Identity; Common Name(s)) | OSHA PEL | ACGIH TLV | Other Limits Recommended | % (optional) |
|---|----------|-----------|-----------------------------|--------------|
| Methyl Ethyl Ketone (2-butanone) | 200 ppm | 200 ppm | N/A | 100% |
| CAS No. 78-93-3 | | | | |

| Boiling Point | | Specific Gravity ($H_2O = 1$) | | |
|--|--|--|------------|-------|
| @ 760 mm HG | 175.3°F | | | 0.806 |
| Vapor Pressure (mm Hg.) | | Melting Point | | |
| @ 20°C 70mmH | | | | N/A |
| Vapor Density | | Evaporation Rate | | |
| | 2.5 | (Butyl Acetate = 1) | | 5.7 |
| Solubility in Water Appreciable = 24 | 18 | | | |
| Appearance and Odor | | | | |
| | h sweet odor sim | ilar to acetone | | |
| Section IV — Fire and Explosion Haz | ard Data | | | |
| Flash Point (Method Used) | | Flammable Limits | LEL | UEL |
| | | | | |
| Tag. Open Cuj | $p = 22^{\circ}F$ | In air % by volume | 1.8 | 10 |
| Extinguishing Media | _ | • | 1.8 | 10 |
| Tag. Open Cuj Extinguishing Media Use carbon dioxide or | _ | • | 1.8 | 10 |
| Extinguishing Media | dry chemical for | small fires. | 1.8 | 10 |
| Extinguishing Media Use carbon dioxide or Use alcohol-type foam | dry chemical for | small fires. | 1.8 | 10 |
| Extinguishing Media Use carbon dioxide or Use alcohol-type foam: Special Fire Fighting Procedures | dry chemical for s for large fires | small fires. | | 10 |
| Extinguishing Media Use carbon dioxide or Use alcohol-type foam: Special Fire Fighting Procedures | dry chemical for s for large fires | small fires. | | 10 |
| Extinguishing Media Use carbon dioxide or Use alcohol-type foam Special Fire Fighting Procedures Self-contained (1 | dry chemical for s for large fires NIOSH-approved) b | small fires. | protective | 10 |
| Extinguishing Media Use carbon dioxide or Use alcohol-type foam Special Fire Fighting Procedures Self-contained (1 | dry chemical for s for large fires NIOSH-approved) b | small fires. reathing apparatus and | protective | 10 |

moved by ventilation, and be ignited by various ignition sources.

(Reproduce locally)

OSHA 174, Sept. 1985

| Section V — | Reactivity Data | | | | | |
|--|-------------------------------------|---------|--|---------|----------------|---|
| Stability | Unstable | | Conditions to Avoid | | | |
| | Stable | x | None | | | |
| Incompatibility (Ma | aterials to Avoid) N | lay 1 | eact with oxidizi | ing age | nts and/or o | rganic peroxides. Avoid |
| alkaline m | | | al acids and halo | | | |
| | nposition or Byproc | | | | | |
| | - | arbo | on monoxide and/or | carbo | n dioxide. | |
| Hazardous Polymerization | May Occur | | Conditions to Avoid | | | |
| | Will Not Occur | х | None | | | |
| Section VI — H | lealth Hazard Da | ta | | | | |
| Route(s) of Entry: | | Inha | lation? | Skin? |) | Ingestion? |
| | | mine | Yes | - | es | Yes |
| Health Hazards (A | | al ra | at) = $3,100 \text{mg/kg}$ | . Inhal | ation: lung | irritation, central |
| nervous | system effe | cts | | eadache | | ritation, rashes, |
| Carcinogenicity: | 1 1 | NTF | | | C Monographs? | OSHA Regulated? |
| | | | No | | No | No |
| Signs and Sympto Inhalatio | | on o | f respiratory tra | ct, cou | Ighing, heada | che, nausea. Skin: |
| Dryness, | redness, ra | shes | . Eyes: irritatio | n, pair | | |
| | | spa | sms, nausea, vomi | ting. | | |
| Medical Condition Generally Aggrava | - | | None known. | | | |
| | | Tn | | fresh | air. provide | e oxygen, obtain medical |
| | | | ater for at least | | | |
| | | | n: thoroughly was btain medical hel | | | th water, remove sists or large body |
| | | | stion: give water | | | |
| Section VII — F | Precautions for | Safe H | landling and Use | | | |
| | n in Case Material i eaking liqu | | | ners A | bsorb spille | ed liquid in sand or |
| | | | ve to a safe plac | | | |
| | | | | | | Avoid contact with the |
| skin. Rem | ove all sou: | rces | of ignition. | | | |
| Waste Disposal M | | | | | | |
| | | | regulations. | IIrm I | or disposal | in accordance with all |
| | | | - | | | |
| | | | | | | ctrically bonded to the sparks. Store away from |
| | | | nd ignition sourc Class 1B flammab | | | antities in approved |
| Other Precautions | 3 | | actices should al | | | |
| | Control Measure | | | | | |
| | | | required if cond | rentrat | ion is helow | PEL At higher |
| | | | | | | filter should be worn. |
| Ventilation | Local Exhaus | t | r high concentrat | | Special All el | lectrical equipment must Group D; fans must be |
| | Mechanical (| General |) | | Other | |
| Protective Gloves | I | | | Eye Pro | | and/or face chield |
| | Clothing or Equipme | | _ | | | s and/or face shield. |
| | | safe | ty showers, barri | er crea | ums, etc. | |
| Work/Hygienic Pra | actices | | | | | |

| Material Safety Data Sheet | | U.S. Depa | rtment of La | bor | • |
|--|---|---|--|---|-------------------------|
| May be used to comply with | | Occupational | Safety and Health | Administration | |
| OSHW's Hacard Communication Standard | h. | Non-Manduk Form Approve | vy Form) | | |
| CFR 1910.1200. Standard must be rewited for specific requirements. | | CARE No. 121 | N | | |
| consulted for specific requirements. | | Q400 (40.14) | | | |
| DENTITY is used on Labor and UKD | | Total Park up | core are not particular | A stry last is not apple to much be maned to r | 100.011 |
| Methyl Ethyl Ketone INER | 13 | | | | |
| Section I Non-facturer's Name | | L Concerne T | risphone Number | | |
| | | (204 | 123-4566 | | |
| 3YX Chemical Company Address Parents Steel Cep Sum, and 2P Code 111 Main Street | 1 | | index for information 1 123-4522 | | |
| | | Cale Presser | | | |
| New York, MY 10912 | | Janu | ary 5, 1990 | | |
| | | John | | | |
| Section # Hazardous Ingredients/Ide | antity information | | | | |
| | | OSHA PEL | ACCH TLV | Other Linits | Support |
| Nethyl Ethyl Ketose (2-b) | | 200 ppm | 200 ppn | Recommended N/A | 1004 |
| Call No. 78-93-3 | 15.8090047 | 2117 Jun- | 177 PF- | 8//6 | 1000 |
| CAS 80. 1819313 | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | cteriatics | | | | |
| Santon III Physical/Chamical Chara Boing Part | | Specific Grav | 9 240 × 7; | | 6.8541 |
| Boling Pant # 162 mm 193 Stape Pressure (mm/s) | 175.37 | Specific Grav | φ.240+% | | |
| Boling Pant # 162 mm HD | 175.379 76558g | Melling Port | um. | | 16/A |
| Boling Paret # 162 mm 183 Stops Pressure (no mp) # 25°C Vapor Denoty | 175.37 | Melling Port | um. | | |
| Boing Pool # 160 mm 190 Topor Postaurs (no. ng.) # 2010 Vigor Density Sacolny in Water Approc (able = 24) | 175.37 76milig 2.5 | Melling Port | um. | | 8/A |
| Boing Paet # 760 mm H0 Topor Presant Interna) # 20°C Vopor Denaty Southing Water Apprent(able = 24) Annarrows and Den | 175.37 700082 2.5 | Malling Port Evaporation / Jody Acesan | lam 19 | | 8/A |
| Buing Pael # 760 mm H0 Tapor Present printing: # 20°C Vipor Density Saucity in Water Appreciable = 240 Apparence and Oder Citair Tiquid with | 175.379 70miiz 2.5 | Malling Port Evaporation / Jody Acesan | lam 19 | | 8/A |
| Bailing Part 19 T-62, IRD, 193 Tapor Pleases (Inc. 193 20 20 20 Vigor Devely 2 20 20 Vigor Devely 2 20 20 2 2 | 175.37P 20mile 2.5 A sweet odor a rd Data | MetryPort Evaporation / thay Assess / | lan in | it. | 8/A |
| Bailing Part IN 26 A MR 180 IN 20 C Plantary (in a right) In 20 C In 20 C Statuty in Max Apprendiable (in a right) Clear 3 (right) Factor M - Price and Explosion Hase Factor M - Price and Explosion Hase Table Topol Advancement Table Topol Advancement | 175.37P 20mile 2.5 A sweet odor a rd Data | MetryPort Evaporation / thay Assess / | tem 19 | | ¥/λ 5.7 |
| Bailing Part IN 26 A MR 180 IN 20 C Plantary (in a right) In 20 C In 20 C Statuty in Max Apprendiable (in a right) Clear 3 (right) Factor M - Price and Explosion Hase Factor M - Price and Explosion Hase Table Topol Advancement Table Topol Advancement | 175.37F 200082 2.5 A sweet odor a M DMa - 22 ¹ F | Meting Port Evaporation / Budy Assess initian to a Flammatice U Te air | tem retone mis ty volumes | | ¥/λ 5.7 |
| Bing here a 160 am 190 1837C 1837C 1837C 1800 18 | 115.379 26mag 2.3 h sweet oder s h sweet oder s d Des = 22 ⁵ 9 dry chemica) f | Mating Puri Evaporation / Ibay Assess initian to a Flammation () To air or small fi | tem retone mis ty volumes | | 8/A 5.7 |
| since here s - comments and Star Person and Star Person and Star Person and Clear Liquid with Section Person and Explored Autor Star Person and Star Comments Star Person and Star Comments Star Star Star Star Star Star Star Star | 175.379 76mmin 2.5 4 sweet odor = *000 - 22 ⁵ 7 dry chemical f for large fin | Metry Port Evaporation f Ibuy Austra to an initian to a Parenative D Ion anall f TR. | tem is retone why volumes (res. | 15.1 | 8/A 5.7 VEL 10 |
| Bing here a 160 am 190 1837C 1837C 1837C 1800 18 | 175.379 76mmin 2.5 4 sweet odor = *000 - 22 ⁵ 7 dry chemical f for large fin | Metry Port Evaporation f Ibuy Austra to an initian to a Parenative D Ion anall f TR. | tem is retone why volumes (res. | 15.1 | 8/A 5.7 VEL 10 |
| terre year a (a) m (b) year fraken year year fraken year year fraken year (c) year fraken year (c) year (c) year (c) year (c) year (c) year (c) | 175.379 76mmin 2.5 4 sweet odor = • 22 ⁵ 7 dry chemical f for large fin 1058-approved | Metry Port Eveporator / Ibay Access initar to a Flammatic (In all or small f) es. breathing | tem 15 retone * by volumes (res. apparatus at | nd protective | 8/A 5.7 VEL 10 |
| teres have a to a hor hor type frames and the type frames and type frames type frames and type frames and type frames and type frames and type frames and type frames and type for type for type for type of type o | 125.379 26mag 2.5 4 sweet odor = *0045 - 22 ⁵ 9 dry chemical f for large fis 0058-approved) = used in all | Mategraphic Exportant Hay Access Initar to a Farmate L or small fi es. breathing fires invol | tem th retone * by volumes res. apparatus a ving chemic | nd protective | 8/A 5.7 10 |
| Along Yang (2000) Tayar Yanana (2000) Tayar Yanana (2000) Tayar Yanana (2000) Tayar Yanana (2000) Tayar Yang (2000) Tayar Yang (2000) Tayar (2000) T | 175.37P Sensag 2.5 A sweet odor = wd Das = 22 ⁵ P dry chesical f for large fin 00d8-approved a cased in all er than air an | Mading Part Example Initian to a Flammade i Initian to a Flammade i Initian to a Flammade i Initian to a Plammade i Initian to a Initian to a I | tem th retone who t hy volumes res. apparatus a wing chemics t along the | nd protective als. ground, or I | 8/A 5.7 10 |
| long ham s (200 μ) long ham s (200 μ) long ham s (200 μ) long ham long ham lo | 175.37P Sensag 2.5 A sweet odor = wd Das = 22 ⁵ P dry chesical f for large fin 00d8-approved a cased in all er than air an | Mading Part Example Initian to a Flammade i Initian to a Flammade i Initian to a Flammade i Initian to a Plammade i Initian to a Initian to a I | tem th retone who t hy volumes res. apparatus a wing chemics t along the | nd protective als. ground, or 1 a sources. | 8/A 5.7 10 |
| Along Yang (2000) Tayar Yanana (2000) Tayar Yanana (2000) Tayar Yanana (2000) Tayar Yanana (2000) Tayar Yang (2000) Tayar Yang (2000) Tayar (2000) T | 175.37P Sensag 2.5 A sweet odor = wd Das = 22 ⁵ P dry chesical f for large fin 00d8-approved a cased in all er than air an | Mading Part Example Initian to a Flammade i Initian to a Flammade i Initian to a Flammade i Initian to a Plammade i Initian to a Initian to a I | tem th retone who t hy volumes res. apparatus a wing chemics t along the | nd protective als. ground, or 1 a sources. | R/A 5.7 10 6 |

SECTION I: MATERIAL AND MANUFACTURER IDENTIFICATION

| IDENTITY (As used on Label and List) Methyl Ethyl Ketone (MEK) | Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that | | | | |
|--|--|--|--|--|--|
| Section I | | | | | |
| Manufacturer s Name XYX Chemical Company | Emergency Telephone Number (204) 123-4566 | | | | |
| Address (Number, Street, City, State, and ZIP Code) 111 Main Street | Telephone Number for Information (204) 123-4522 | | | | |
| New York, NY 10012 | Date Prepared January 5, 1990 | | | | |
| | Signature of Preparer (optional) John Doe | | | | |

- < Identity of substance should be the same as on label and hazardous substance inventory.
- > Name and address of manufacturer.
- fi Emergency telephone number of manufacturer.
- fl Information number for non-emergency calls.
 - Date MSDS was prepared.
- Identification of preparer.

| Material Safety Data Sheet | | U.S. Depa | rtment of La | bor | Ŷ |
|--|--|---|--|---------------------------------------|-------------------------|
| May be used to comply with | | Occupational | Safety and Health | Administration | |
| 05HV's Hazard Communication Standard. 29 CFR 1910 1330. Standard must be | | Non-Mandak Form Approve | ry Form) | | |
| consulted for specific requirements. | | OM9 No. 121 | -0072 | | |
| | | | | A sty dama not applice | |
| DENTITY He want on Labor and Like Nethy? Ethy? Ketone (NEE) | | Alter Dana spe adjurnali | of a sushible. Pe apa | CONTRACTOR PRIME TO P | and an out |
| lection I | | | | | |
| dan dadararia harre | | Energency Te | rieghane Number | | |
| XXX Chenical Company | | (204 | 123-4566 | | |
| Address physics, Speet Cay State, and SP Cade; 111 Main: Street | | (204 | 123-4522 | • | |
| New York, MY 10012 | | | ry 5, 1990 | | |
| New YORK, MY 10917 | | Environment of 7 | TALANS JURNAL | | |
| | | John | 5oe | _ | |
| Section 8 Hazardous Ingredients/Ident | ity information | | | | |
| Harantova Components (Specific Charries Interthy) | Common Namena) | COHA PEL | ACCH TUY | Other Limits Recommended | S (prime) |
| Methyl Ethyl Ketone (2-but) | | 200 ppm | 200 ppn | 8/A | 1004 |
| CAS No. 78-93-3 | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | viation | 1 Back Sec | | | |
| Boirg Part # 762 mm (#) | vision 175.37 | Specific Grav | ¥948+1 | | 0.0041 |
| Boing Poet a T-60 mm 190 teach Presant (mm 192 | 175.379 | Specific Grav | 4 (4 5 + 1) | | |
| Boing Part # 762 mm 183 Tapor Pressure (res rep) # 2970 | 175.379 70mild | Netry Port | ue . | | 8/A |
| Boling Pipet a 7.62 mm 193 Ispon Phesawar pine rep: a 2.97 C argon Censity | 175.379 | Melling Part | ue . | | |
| Boing Point a 760 mm 180 Tabor Presant mm rg: B 2010 Tabor Density Society in Mater approxishing = 218 | 175.379 70mild | Netry Port | ue . | | 8/A |
| Butry Point <u>a 160 mm (H0)</u> Tapor Presaure (mm (H0) <u>a 2017</u> Singer Density Songer and Water <u>Apprendiability</u> = 248 Extensions and Det | 175.37 70mile 7.5 | Neting Punt Evaporation 7 (Buly Accisite | lam 1) | | 8/A |
| Butry Point <u>a 760 em 90</u> Tapor Presant (em 190) <u>a 2017</u> Bigor Densky Sacony e War <u>Apprentishile = 248</u> Appearance and Ode Clear I Spaid with it | 115.37 70mile 2.5 | Neting Punt Evaporation 7 (Buly Accisite | lam 1) | | 8/A |
| Autor Pet 8 (20) million (10) 1000 Platest (10) million 1000 Platest (10) million 1000 Platest 1000 Platest 2000 Platest Clear Signid with 1 Section W - Fina and Explosion Haused I Truch them same to com | 175.37F 70milg 2.3 rweet odor at | Mating Port | cetote | 105, | 8/A 5.2 |
| boog Port 8 160, mm 100 | 175.37F 70milg 2.3 rweet odor at | Mating Port | tee 1) cetote | 105. | 8/A 5.7 |
| boog Port 8 160, mm 100 | 175.379 70milg 2.5 west odor 4 046 22 ⁵ 7 | Netry Port Evaporation day notice to anilar to a Flammable L To air | cetone mis k by volumes | LES. | 8/A 5.2 |
| Колд Уна (19) | 175.379 70mild 2.5 70mild 2.5 70mild 2.5 70mild 2.5 70mild 2.5 70mild 2.5 | Neing Puri Exeponent F Day action milar to a Flammable U 10 all Y | cetone mis k by volumes | UR. 1.4 | 8/A 5.2 |
| Inters Part 8 - 50 pm 100 Part Plantar Internyl Caper Dennik Caper Dennik Caper I Special Solita - 2014 Special Special Solita - 2014 Special Special Specia | 175.379 70mild 2.5 Nexet odor a 22 ¹ 9 22 ¹ 9 22 ¹ 9 22 ¹ 9 22 ¹ 9 22 ¹ 9 | Nating Part Exaposition F thay notice in millar to a Flammable (c E all r to small f) | are 19 estate Ma 8 by volumes res. | 1.33 | 18/A 5.7 10 10 |
| bings Press 0.20 m (B0) http://www.science.com/science/sc | 175.379 75mmitz 2.5 7weet odor at 22 ¹ 9 7 obenical fo ar large fir SH-approved | Nating Part Exaposition P Induction of Planmatic U. In all P In all P In all P In all P In all P | tem 15 retone nés k by volcames res. | nd protective | 18/A 5.7 10 10 |
| bings Press 0.20 m (B0) http://www.science.com/science/sc | 175.379 75mmitz 2.5 7weet odor at 22 ¹ 9 7 obenical fo ar large fir SH-approved | Nating Part Exaposition P International Plannation D In all P In all P In all P In all P In all P | tem 15 retone nés k by volcames res. | nd protective | 18/A 5.7 10 10 |
| hang-hang = 4.52 mm 100 map Frankrash ang 10 map Frankrash ang | 175.379 70mitz 2.5 2.5 2279 2779 2779 2779 2779 2779 2779 279 | Mathy Port Example 1 milar to a Flarmade 1 In air to anall fi to. breathing fires intol | in is is is is is is is is is is | nd protective | 8/A 5.2 10 10 |
| hang-hang yan Prakana (Jan Kalan) yan Prakana (Jan Kalan) yan Prakana (Jan Kalan) Sanding Pang Sanding Pang (Jest Tapold Vich) Sanding Pang (Jest Tapold Vich) (Jest Tapold Vich) (J | 125.379 70mmig 2.5 2.5 2.5 22 ¹ 9 y chemical f or large fix 88-approved: used in all that air an | Makey Port Exponent Initian to a Flammabe U Flammabe U or small fi to. breathing fires incol d may trave | etone to by volumes res. apparatus a viag chemics cl along the | nd protective als. ground, or t | 8/A 5.2 10 10 |
| Tack Present (many) tacany may benefit tacany may argument and tools tacany may argument and tools tacany may tacany may be the tacany may be the tacany argument tacany argument taca | 125.379 70mmig 2.5 2.5 2.5 22 ¹ 9 y chemical f or large fix 88-approved: used in all that air an | Makey Port Exponent Initian to a Flammabe U Flammabe U or small fi to. breathing fires incol d may trave | etone to by volumes res. apparatus a viag chemics cl along the | nd protective als. ground, ar 3 | 8/A 5.2 10 10 |
| Interface # 15. mt 10 up Presna 3. The Up Presna 3. The Department of Up Presna 1. The Presna 3. The 1. The Presna 3. The Presna 3. The 1. The Presna 3. The Presna 3. The 1. The Presna 3. The Presna 3. The Presna | 125.379 70mmig 2.5 2.5 2.5 22 ¹ 9 y chemical f or large fix 88-approved: used in all that air an | Makey Port Exponent Initian to a Flammabe U Flammabe U or small fi to. breathing fires incol d may trave | etone to by volumes res. apparatus a viag chemics cl along the | nd protective als. ground, ar 3 | 8/A 5,2 VfL 30 |

SECTION II: INGREDIENTS

| Section II — Hazardous Ingredients/Identity Information Hazardous Components (Specific Chemical Identity; Common Name(s)) (optional) | OS | HA PEL | | ACGIH TLV | Other Limits Recommen | ded % |
|--|-------|--------|-----|------------------|--------------------------|-------|
| Methyl Ethyl Ketone (2-butanone) | 200 p | pm | 200 | ppm | N/A | 100% |
| CAS No. 78-93-3 | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

- < **Composition:** Hazardous substances must be identified as ingredients of a product if they exist at concentrations exceeding 1% by weight or 0.1% if the ingredient is an identified carcinogen (see Section VI).
- CAS number. When applicable, the Chemical Abstract Service (CAS) registry number is listed as a key to definitive identification of the material, without regard to any government regulation. Most products consisting of one chemical will have a number. Mixtures do not have a CAS number. The California Hazard Communication Regulation requires CAS numbers, whereas the federal standard does not.
- $fi \quad \mbox{Common names or synonyms should be identified.}$
- fl **TLV and PEL.** The TLV or Threshold Limit Value and PEL or Permissible Exposure Limit are occupational exposure standards that express the airborne concentration of a material to which
- nearly all healthy persons can be exposed day after day without adverse effects. Some shorter-term
 exposure limits (ceiling values, excursion limits and short-term exposure limits or STELS) also may
 be included.
- † **Percentage.** Describes the percentage by weight of each component listed.

| Material Safety Data Sheet | | U.S. Depa | rtment of Lai | bor | • |
|--|--|---|---|---|-------------------------|
| May be used to comply with OSHUS Hazard Communication Standard. | | Occupational (Non-Mandate | Safety and Health | Administration | |
| OSHIL'S Hazard Communication Standard, 29 CFR 1910.1200. Standard must be | | Form Approve | | | |
| consulted for specific requirements. | | OM/8 No. 121 | 8-0872 | | |
| DENTITY physican and any | | Acta Dara co alignedi | no se of joindat | Fary dark a not apple to must be mailed to a | dia 210 dias 74 |
| Sector I | | | | | |
| Waturfacturer's Name | | Energency Tr | rephone Number | | |
| XXX Chenical Corpany Allows motor limit On Itun ard DP Colle | | Tentiore In | 123-4566 | | _ |
| 111 Hais Street | | | 123-4522 | | |
| New York, MY 10012 | | Cate Preparet | HTY 5, 1990 | | |
| | | Signature of P | Dia | | |
| Section 8 Hazardous Impredients/Identity In | information | 1000 | | | |
| Hazardova Components (Specific Dennical Meetily, Com- | | OSHA PEL | ACCHIEV | Other Limits Recommended | Number |
| Methyl Ethyl Ketone (2-butano | | 200 000 | 200 pps | 16/A | 1008 |
| CAS NO. 78-93-3 | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Sector II Physical Chemical Characterist | ics. | Specific Coar | la mún ti | | |
| Bolivy Paint # TGO mm 192 | ica 115.3'F | | \$250×11 | | 6.8343 |
| Burling Plant (# 150 mm 180 Valuer Pressure (mm rg) (# 2015) | | Slating Port | | | 6.8243 B/A |
| Boling Plant 9 TGO mm 183 Visuer Pressure (nm mp.) | 175.3'9 | Nating Port | lane - | | |
| Bulling Plant ar Tico wen 192 Value Presser (nm na) ar 2010 Value Density Scholath & Value | 175.3'F | Slating Port | lane - | | 8/3 |
| Boling Plant # 760 mm 193 B 20°C Vere Present # 20°C Vere Denits Bouilty in Water Appreciable = 24% Accounts of Den | 175.3'F Tonnig 2.5 | Nating Port Craporation (Duly Astron | iane 19 | | 8/3 |
| Bong hat too an HO Vapor Prosers (norms) 8 20 T Vapor Density Salada and Char Appreciable = 244 Appendix and Char Clarar Signaid with some | 175.3'P Ténnig 2.5 | Nating Port Craporation (Duly Astron | iane 19 | | 8/3 |
| Boung Part 8 Too wen 190 Varent Parters non ryu 2 Too Varent Parters Apprentiable = 244 Appennion and Canar 1 (geld with seen Clean 1 (geld with seen Santian Yu - Pay and Explainton Hazard Otto | 175.3'P Ténnig 2.5 | Netry Port Exponent Bay Annu - | cetone | uts. | 8/A 5.7 |
| Boog Pool 9 Too en 190 1970 1970 Veer Dreads Booking works Approxisible = 244 Approxisible = 244 A | 115.3'P Tonnag 2.5 et odor sin | Netry Port Exponent Bay Annu - | un 19 cesone | UB: 3.4 | B/3. 3.7 |
| Boog Pad 9 TGC en 193 Ver Prove 1 on 10 1 3 75 Ver Ponds Sobily v Mar Apparentable = 249 Apparentable = 249 Apparentable = 249 Char Liquid with eve Satis - Fix and Explore Mazad Stat | 115.2'F Tonika 2.5 e5 odor sin | Nating Port Evaporation 1 (0.4) Annual millar to a Plannable (. In air | cetone ng Ng by volumes | UE. 5.4 | 8/A 5.7 |
| bioghad * 4 50 mm 195 Star / Teach Tonn 195 Star / Teach 195 | 115.2'F TimeNg 2.5 et odor sin "F thesical fo | Netting Port Evaporation 1 (Bay Assess Filter to a Filtering to (In all r small f) | cetone ng Ng by volumes | U8. 1.1 | 8/A 5.7 |
| Hong hard # 100 mm HS Vare Pharms from TB Vare Pharms (John Statisty in Year Statisty in Year St | 175.3'P Tonnag 2.6 et odor sin "P themical fo large fice | Nedlog Port Cosponent Day Annue nilar to a Plannate (c In air r small fi s. | Lan 19 Cetone Mb 1 by Yolumes (Fes. | 3.4 | К/А 3.7 VEL 19 |
| tiong nut a 100 mm 152 ther Promer and the there have been the provided of the second the provided of the second the second of the second of the second the second second of the second of the the second second of the second of the the second second of the second of the second of the of the second of the second of the second of the second of the second of the second of the second of the second of the second of | 115.3'P Tionsig 2.5 et odor sin "P themical fo large fice approved) | Name Port Composition (Day Annual Marcale U In air r small fi s. breathing | am 19 cetone wh by volumes res. spparatus at | 1.4 | К/А 3.7 VEL 19 |
| tions man s (1) and man there have a 100 there have a 100 Status V was a provide a 100 Status V was a provide a 100 Status V of the status of the status status V of the status of the status Tay Other (100 - 100 Status V of the status of the status status of the status of the status of the status status of the status of the status of the status status of the status of the status of the status of the status status of the status of the stat | 115,3% Tonnig 2.5 ** todor air ** themical fo large fire approved) td in all f | Nading Port Composition I They assure The approach of the Inter Sone Flavouries Inter Sone Flavouries Inter Sone Sone Sone Sone Sone Sone Sone Sone | estone why by volumes res. spperatus an ving chemics | d protectiv | 8/A 3.7 VE. 19 |
| None mut a 100 m 192 View Promot 2020 View Promot 2020 Social or New Constraints - 244 Anamous and Constraints - 244 Reaction of Constraints - 244 Reaction of Constraints - 244 Reaction of Constraints - 244 Reaction of Constraints - 244 Data Alexanda Alexandro - 244 Data Alexanda Alexandro - 244 Data Alexanda Alexandro - 244 Constraints - 245 Constraints - 2 | 175.3% TomBe 2.5 et odor sin hemical fo large fire approved) ed in all f han air and | Numper Superson Super | estone why by volumes res. spperatus an ving chemics ti along the | d protective da. ground. dr 1 | 8/A 3.7 VE. 19 |
| tions man s (1) and man there have a (1) there have a (1) there have the a (1) the | 175.3% TomBe 2.5 ** ** ** ** ** ** ** ** ** ** ** ** ** | Numper Superson Super | estone why by volumes res. spperatus an ving chemics ti along the | d protective tim. ground. or 1 | 8/A 3.7 VE. 19 |

SECTION III: PHYSICAL DATA

| Boiling Point | | Specific Gravity (H ₂ O = 1) | |
|-------------------------|--------------------|---|--------|
| @ 760 mm HG | 175.3°F | | 0.8061 |
| Vapor Pressure (mm Hg.) | | Melting Point | |
| @ 20°C | 70mmHg | - | N/A |
| Vapor Density | | Evaporation Rate | |
| | 2.5 | (Butyl Acetate = 1) | 5.7 |
| Solubility in Water | | • | |
| Appreciable = | 24% | | |
| Appearance and Odor | | | |
| Clear liquid w | ith sweet odor sim | ilar to acetone | |

The physical data section describes the physical characteristics of the material.

- < **Boiling point.** Refers to the temperature, in degrees F, at which a liquid changes to a vapor state, generally at a pressure of one atmosphere. For mixtures or process streams, the initial boiling point or boiling range may be given. Flammable materials with low boiling points generally present special fire hazards.
- Specific gravity. Refers to the ratio of the weight of a volume of material to the weight of an equal volume of water. In other words, how dense (heavy) the material is in comparison with water. For insoluble materials, a ratio of less than one means the material is lighter than water and will float on the surface. If the ratio is greater than one, the insoluble material will sink. Most flammable liquids (but not all) are lighter than water.
- fi **Vapor pressure.** Refers to the pressure of a saturated vapor above a liquid, in millimeters of mercury (mm of Hg) at 20°C (unless stated otherwise). For example, the vapor pressure of water at 20°C is 17.5 mm of Hg; by comparison, sea level atmospheric pressure at 20°C is 760 mm of Hg. The lower the boiling point of a liquid, the higher the vapor pressure.
- fl Melting Point. The point where a solid becomes a liquid measured in degrees F or C.

Vapor density. Refers to the relative density or weight of a vapor or a gas compared with an equal volume of air. Air is rated at 1.0. A figure greater than 1.0 indicates a vapor or gas heavier than air, and vice versa. Concentrated vapors which are heavier than air can accumulate in low places, such as along floors, in sewers, elevator shafts, floor drains.

 Evaporation rate. Evaporation rate is the rate at which a material is converted to the vapor state at any given temperature and pressure. All materials evaporate; it is the differing rates that are of concern in addressing worker exposures and fire protection. Butyl acetate is rated at 1.0 as a reference. [†] **Solubility in water.** The following is an explanation of terms used to express the solubility of a product by weight in water at ambient temperatures. Most solvents are tested at 68°F.

| Negligible | | less than 0.1 percent |
|-------------|---|-----------------------|
| Slight | · | 0.1 to 1.0 percent |
| Moderate | | 1.0 to 10 percent |
| Appreciable | | more than 10 percent |
| Complete | | in all proportions |

Solubility information is useful in determining effective fire extinguishing methods and spill cleanup procedures.

Appearance and odor. A brief description of the product under normal room temperature and atmospheric conditions.

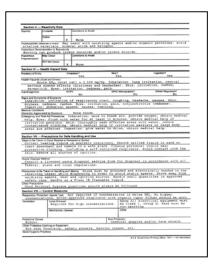
| Material Safety Data Sheet May be used to comply with 05HA's Hazard Communication Stand 59 CHR 1970, 1200, Standard must be consulted for specific requirements. | M. | U.S. Department of Lal Occupational Safety and Health (Non-Mandatory Form) Form Approval OMB No. 1218-0072 | Administration | ø |
|---|--|---|-------------------------------------|-------------------------|
| Methyl Ethyl Ectone (M | 80 | Non Sam gazes an organistic o oformation a mathem for gas | | 64, 17 % 6149 Fré |
| Section 1 | | | | |
| XIX Chenical Company | | Energency Telephone Number (204) 123-4566 | | |
| Allows / Auror. Steet Co. Steet are by Co. 111 Main Street | - | Telephone Number for Information (204) 123-4522 | | |
| | | Date Prepared | | |
| New York, MY 10912 | | January 5, 1990 Equate of Pepare Junital | | |
| | | John Die | | |
| Section 8 — Hazardous Ingrediental | identity information | | Other Umits | |
| ratartical Components (Specific Oversial ID | | OSHAPEL ACSHITLY | Facammenoed 3/A | Signor |
| Rethyl Ethyl Ketone (2- CAS No. 78-53-3 | butanose) | 200 pps 200 pps | 3/A | 100% |
| | | | | |
| | | | | |
| | roctariation | - | | |
| Section III Physical Chamical Cha Buring Fort 10 1 1 (→ m. 10) | uscanation 175.379 | Specific Cranty (H,D+1) | | 0.0543 |
| Bolog Part # 160 am 180 1300 Pessare (units) # 2112 | 175.37 | SMENG POR | | 0.0043 9/A |
| Bolog Part # 160 am 180 1300 Pessare (units) # 2112 | 175.352 70enig | Netting Point | | |
| Burling Rout III Trich Inter (H) IIII Dar Pressure (H) (H) IIII Dar Pressure IIII Dar Density Scholler in Mater | 575.3*9 70milg 2.5 | SMENG POR | | 8/3. |
| Ruley Poet # 160 mm 100 Topor Pestive Joint (g) # 30% Visor Dentity Saustion Mater Approximation State | 175.372 70mig 2.5 | Malting Port Exaporation Rate (Rug Aproxim + To | | 8/3. |
| Ruby Poet Tapo Poetano INO Tapo Poetano INO a 1972 Tapo Poetano Sapara Indea Approciable = 2 Appendia Note Clear Liquid wi | 175.279 50mig 2.6 18 16 sweet odor al | Malting Port Exaporation Rate (Rug Aproxim + To | | 8/3. |
| Integ Part w 1-(-) mm (H) - 1007 Passard (no. mg) - 1027 Noor Dendy Solution of the Approximation of the Approximation of the Approximation of the - Clear 1 Liquid w(Section M - Fire and Explosion His Then them among units | 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 | Nating Port Evaporation Rate (Buy Instance 1) milliar: to acceloted Parameter Cente | 1.05 | 9/A 5.7 |
| Inter Part 9 10 mm 100 1000 Petition (mmm) 1000 Petition (mmm) 1000 Petition 1000 Petition | 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 | Samong Point Examples in (bag tensors to millar to acetote | | 8/A. 5.7 |
| Inter Part 9 10 mm 100 1000 Petition (mmm) 1000 Petition (mmm) 1000 Petition 1000 Petition | 175.3% 50mBg 2.5 34 35 sevent odor at and Date sp = 23% | Mathy Port Cappyon Res (bay home - 1) =:llar to ecetone Fermina Links In air * by volumes | | 9/A 5.7 |
| Every Rev | 2.5 300000 2.5 30 avent odor al and Date 32 22 ¹⁷ 7 day obesided for | Matry Port Caparato Res (bay horse - 1) miller to acetone Farmate Lonis In air % by volumes r shall fires. | | 9/A 5.7 |
| Nove Port 9 1 (-) and 100 1007 Phatter porting 1007 Port 1007 | 555.3% 50mig 2.5 ab ard Onio ard Ard Onio ard Onio ard Onio ard Onio ard Onio ard On | Weighter (Laporate Re Bacharach nils: to actions Parvase unit Is air 4 by volumes or shall fires. S. | 15.4 | N/A 5.7 VEL 10 |
| hine har | 135.3% 20mbig 2.3 2.4 2.4 2.4 2.4 2.4 2.4 2.4 2.4 | Many Port Encourse Res Sha none to milar to apertoin Tanvare Lenk Ta air % By volumes or small Lines. w. Dreathing apparetus at | a geotection | N/A 5.7 VEL 10 |
| None New * 1 + 0 = m = 0 Trans Prison - 1 = -0 Trans Prison - 1 = -0 Trans Prime - 1 = -0 Trans Prime - 1 = -0 Trans - 1 = -0 Trans0 Trans - 0 Trans - 0 Tr | 135.3% 30edig 2.5 44 45 45 45 45 45 45 45 45 4 | Many Port Engineers in Tagonate in Tagonate to a Tagonate to b Tagonate | al protective | 8/A 5,7 VEL 10 |
| None New * 1 + 0 = m = 0 Trans Prison - 1 = -0 Trans Prison - 1 = -0 Trans Prime - 1 = -0 Trans Prime - 1 = -0 Trans - 1 = -0 Trans0 Trans - 0 Trans - 0 Tr | 135.3% 30edig 2.5 44 45 45 45 45 45 45 45 45 4 | Many Port Encourse Res Sha none to milar to apertoin Tanvare Lenk Ta air % By volumes or small Lines. w. Dreathing apparetus at | al protective | 8/A 5,7 VEL 10 |
| None New * 1 + 0 × m 10 Trace Pristance | 195.3% 30edig 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 | Many Port Engineers in Tagonate in Tagonate to a Tagonate to b Tagonate | d protective de. ground, et.b | 8/A 5,7 VEL 10 |

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

| Flash Point (Method Used) | Flammable Limits | LEL | UEL |
|---------------------------------------|---------------------------|------------|-----|
| Tag. Open Cup = 22°F | In air % by volume | 1.8 | 10 |
| Extinguishing Media | | | |
| Use carbon dioxide or dry chemical fo | or small fires. | | |
| | | | |
| Use alcohol-type foams for large fire | s. | | |
| Special Fire Fighting Procedures | | | |
| Self-contained (NIOSH-approved) | breathing apparatus and | protective | 2 |
| | | | |
| clothing should be used in all f | ires involving chemicals | 5. | |
| Unusual Fire and Explosion Hazards | | | |
| | l may travel along the gr | | - |

- Flash point and method used. The flash point is the lowest temperature at which vapor is given off in sufficient quantity so that the vapor/air mixture above the surface of the material will propagate a flame away from the source of ignition. Since flash points vary according to how they are obtained, the methods used are also listed. Tag Closed Cup (TCC), Pensky-Martins Closed Cup (PMCC), and Setaflash (SETA) methods are those used most extensively.
- Flammable limits/percent volume in air. When flammable vapors are mixed with air in the proper proportions, the mixture can be ignited by a spark or flame. The range of concentrations over which the flash will occur is designated by the Lower Explosive Limit (LEL) and the Upper Explosive Limit (UEL). Flammable limits (explosive limits) are expressed in percent by volume of vapor in air.
- fi **Extinguishing media.** The selection of fire extinguishing media is based on the type of chemical, its physical properties and flammable characteristics. The most common types of extinguishing media are water, CO₂, dry chemical and foam.
- fl **Special fire fighting procedures.** General fire fighting methods are not described but special procedures or exceptions to the rule are listed.

Unusual fire and explosion hazards. Described are the hazards associated with a chemical reaction or change in chemical form or composition that might occur under heat or fire conditions. Also described are hazards that may need to be considered while extinguishing a fire with one of the available types of extinguishing media.



SECTION V: REACTIVITY DATA

| Section V — | Reactivity Data | | |
|-------------------|---------------------|--------|---|
| Stability | Unstable | | Conditions to Avoid |
| | Stable | | |
| | | Х | None |
| Incompatibility (| Materials to Avoid) | May | react with oxidizing agents and/or organic peroxides. |
| Avoid alka | aline materi | als, | mineral acids and halogens. |
| Hazardous Deco | omposition or Byp | roduct | S |
| Burning c | an produce c | arbo | on monoxide and/or carbon dioxide. |
| Hazardous | May Occur | | Conditions to Avoid |
| Polymerization | , | | |
| | Will Not Occur | | |
| | | Х | None |
| | | | • |

This section describes the general reactivity of the material, conditions to avoid in order to prevent an unwanted reaction and toxic substances emitted from the reaction.

- < **Stability.** Indicates whether the material is susceptible to dangerous decomposition and under what conditions it might occur.
- > **Conditions to avoid.** Conditions to avoid are described, such as temperature extremes, jarring, inappropriate storage.
- fi Incompatibility. Lists materials that could react with the substance.
- fl **Hazardous decomposition products.** Describes hazardous materials produced from a reaction by burning, oxidation, heating or reacting with other chemicals.

Hazardous polymerization. Polymerization is a chemical reaction in which two or more small molecules combine to form larger molecules that contain repeating structural units of the original molecules. A hazardous polymerization may result in an uncontrolled release of energy and hazardous materials.

| Bacillon V. | - Reactivity Date | | | | | |
|---|--|---|--|--|--|--|
| Datality | Al-statile | Conditions | to Avoid | | | |
| | Code: | | | | | |
| | | X None | | | | ic perceides. Avo |
| alkaline | materials. | elnerel eri | de and hal | ing agents and/ | or organi | to peroxides. Avo |
| | | | white models | r carbon disaid | | |
| warmany . | May-Const | Lononore | 10 4400 | IT EXCENT BUILDED | | |
| wynerastor | No. No. Conse | ++ | | | | |
| | | X None | | | | |
| Section VI | - Health Hazard 0 | ieta . | | | | |
| ANNOL OF EVE | TY. | Tes | | Bash Yes | | Ingeston? Yes |
| wallh Facanda | Auto and Chronic | | | | | |
| | | | | eadaches), Skin | i isritet | tion, rashes, |
| | | irritation. | redness. | gain. | | Ofina Resultant? |
| | | NOPT NO. | | weet; Manophone | No | OSHA Reputert |
| ligns and Sum | gione of Expenses | | | ant monthing 1 | and solve | names this: |
| 003488 | , redness, r | anhes. Syes | . irritali | ect, coughing, l on, gain, conju iting. | ICLIVILLE | (redness), |
| Dispession Links | oni abdomina | apasme, n | #104#, VDB | iting. | | |
| General's Age | mained by Exponent | Note 1 | LINCOME. | | | gen, obtain media |
| | | | one more to | | | |
| | | | | | | |
| help. B | yes: Gush w | ith water f | or at least | t 15 minutes, of | stain med | lical help if |
| help. E | ves: flush w | Shis: the gais: the | or at lease coughly was medical he | t 15 minutes, of ah affected are to if irritation | stain med s with w | lical help if ster, remove a or large body |
| help. E irritat contant: | ves: flush x ion persists nated clothic re affected | Shid: Chu Shid: Chu ng. obtain Ingestion: | or at least couphly we medical he give wate | t 15 minutes, of ah affected are ip if irritation r to drink, obt | stain med s with w permist sin medic | ical help if ster, renove a or large body al belp. |
| help. E irritat contani: areas a | ves: flush x lon persists nated clothin re affected | ith water f . Skie: thu og. obtain Ingestion: | give wate | t 15 minutes, of sh affected are ip if irritatio r to drink, obt | persial persial persial | lical help if ater, remove a or large body al help. |
| help. E Lirritati contanti areas a Bection VI | Precautions for | ith water f . Exis: thu op. obtain ingestion: r Safe Handing | or at least coupling wh medical he give wate and the | t 15 minutes, of ah affected are ip if irritation r to drink, obt. | stain medic | nical heip if ater, renove a or large body al heip. |
| help. E Lirritati contanti areas a Bection VI | Precautions for | ith water f . Exis: thu op. obtain ingestion: r Safe Handing | or at least coupling wh medical he give wate and the | t 15 minutes, of ah affected are ip if irritation r to drink, obt. | stain medic | nical heip if ater, renove a or large body al heip. |
| help. E irritat contation areas a Section VI lings to be for Collect | Precautions for International States Precautions for Institute Line Institute Line Institute Line | ith water f . Enie: the ng. obtain : Ingestion: . Safe Handing In Researd of So vid in seal | or at least couphly wh modical he give wate and the she shis conta | t is minutes, of th affected are p if irritation r to drink, obt. | persist wells | ical belg if exter, remove a or large body al belg. quid in send or |
| help. E irritat contation areas a Section VI lings to be for Collect | Precautions for International States Precautions for Institute Line Institute Line Institute Line | ith water f . Enie: the ng. obtain : Ingestion: . Safe Handing In Researd of So vid in seal | or at least couphly wh modical he give wate and the she shis conta | t 15 minutes, of ah affected are ip if irritation r to drink, obt. | persist wells | ical belg if exter, remove a or large body al belg. quid in send or |
| help. R Lirritat contanti areas a Section VE Collact Libert a protect skin. R | President State of St | ith water f . Enie: the ng. obtain : Ingestion: . Safe Handing In Researd of So vid in seal | or at least couphly wh modical he give wate and the she shis conta | t is minutes, of th affected are p if irritation r to drink, obt. | persist wells | ical belg if exter, remove a or large body al belg. quid in send or |
| help. B Lirritat. contant: areas a Section VI Dega to To Collect intert a gcolect skin. F Rack Depose Contact skin. F | | Ith veter C Enio Chu ng obtain Ingestion: Safa Handing In Armond of to Vid In seat Infording Uries Of 19 Vatte diopo | or at least coupling on give wate give wate net and the pro- site costs a self-cost a self a self-cost a self a self | t 15 minutes, of a affected are in if irritation r to drink, obt. (e. Cleanup per ctained respire | pilled in and of the second se | ical belg if exter, remove a or large body al belg. quid in send or |
| help. E irritati contani: areas a feater W footant Collect skin. B man Depos Contact federal federal | <pre>press flash w lon persists hared clashi re affected. Precautions to man n Case More lashing lip hunching lip hunching lip hunching with hunching lip hunching lip hunching lip hunching store all bo a licensed. a licensed.</pre> | ith weiger C Shine Chin ng, obtain Ingestion: Safe Handling in Research of the Annual of the reserve Co Including vertex of 19 vante dispo local repui | or at least sudical har give vate and the program as a safe pla a self-co mitton. eal servic ations. | t 15 minutes, of is affected are in if irritation r to drink, obtain iners. Absorb m for. Cleanup per stained respire e fire for disp. | pilled is source of the source | ical heip if a or large body a or large body all help. ould wear ould wear d contact with t |
| help. R irritati aftas a Bectus W Deptus De Ta Collect intert a grotact skin. B Dank Deptu Consult federal | yes, Eish, w ion persists <u>sated clothi</u> <i>re</i> affected. Precations for man n Case Marks inaking lip borrest and <i>tre clothing</i> <i>satewore</i> all bo <i>a Merod</i> <i>a licensed</i> . , state and | ith weiger C Shine Cho ng obtain Ingestion: Safe Handling re Research in shi remove the including urrees of ip vente dispo local repai | or at least couplely we modical he give wate and the mod the m | 1 15 minutes, of a affected are in affected are in if irritation r to drink, obt. iners, Absorb a co. Cleanup per otained respire a firm for disp. | pilled in a control of the second of the sec | ical heip if as or large body a or large body al heip. opid in mand or opid waar d contart with t providence with t |
| help. R irritati aftas a Bectus W Deptus De Ta Collect intert a grotact skin. B Dank Deptu Consult federal | yes, Eish, w ion persists <u>sated clothi</u> <i>re</i> affected. Precations for man n Case Marks inaking lip borrest and <i>tre clothing</i> <i>satewore</i> all bo <i>a Merod</i> <i>a licensed</i> . , state and | ith weiger C Shine Cho ng obtain Ingestion: Safe Handling re Research in shi remove the including urrees of ip vente dispo local repai | or at least couplely we modical he give wate and the mod the m | 1 15 minutes, of a affected are in affected are in if irritation r to drink, obt. iners, Absorb a co. Cleanup per otained respire a firm for disp. | pilled in a control of the second of the sec | ical heip if as or large body a or large body al heip. opid in mand or opid waar d contart with t providence with t |
| heip. B Lipritat contanti areas a Section V Collact Collact Lowrt a protect akin. B Rase Depon Consult federal Nessione a receivi coldici | yes, fish, w no persists hared clothic e affected. - Precastors by how the set of the institution of the persons and the persons all so a buffer and he takes is a distance he takes is a dis a dis a distance he takes is a distance he takes is a | ith weiger C Shine Cho ng obtain Ingestion: Safe Handling re Research in shi remove the including urrees of ip vente dispo local repai | or at least couplely we modical he give wate and the mod the m | 1 15 minutes, of a affected are in affected are in if irritation r to drink, obt. iners, Absorb m co. Cleanup per otained respire a firm for disp. | pilled in a control of the second of the sec | ical heip if as or large body a or large body al heip. opid in mand or opid waar d contart with t providence with t |
| halp, B irritat containt areas a faction VI impose to to to containt interv a protect shire for main Depen Consult federal Neuroneuvi containt affety, affety | <pre>press Fish, a fish of the periods and the solution periods and the solution of the soluti</pre> | ich.weiter C. Exist. Chu, Shiai Chu, Shia | or at least coupling we madical he give wate and the more a said course a said course | 1 is invice. of in affected are in if irritation r to drive. which inter. Absorb m det. Cleanup per affirm for diago by provided and err to arritation rest. Second and err to arritation | pilled in medic pilled in medic polled in control sh torr Angle meal in a mic sparts | ical heip if a or large body a or large body all help. ould wear ould wear d contact with t |
| help, B irrital contanti artess s factors to the factors of the contant of the contant of the shint for factors of protects factors of protects fa | pres. Flash we ion persists hared clother precasions by ion of the second provide the second investigation and investigation investigation in the second in | ich weiter C Shie Chu, | or at least coupling we madical he give wate and the more a said course a said course | 1 15 minutes, of a affected are in affected are in if irritation r to drink, obt. iners, Absorb m co. Cleanup per otained respire a firm for disp. | pilled in medic pilled in medic polled in control sh torr Angle meal in a mic sparts | ical heip if aser, removed a or bigs body al heip. opid in mand or opid waar d contart with t providence with t |
| help, E trritati contanti artean m Sectory VI- Insert VI- postory VI- postory VI- postory VI- postory VI- Rein VI- Rein VI- Postory VI- Rein VI- Postory VI- Po | <pre>pression for first parts of the second second</pre> | (1) weiger C Stranger (1) Stranger (1) (2) Stranger (2) (2) Stranger (2) Stranger (2) (2) Stranger (2) Stranger (2) Stranger (2) Stranger (| ir at lans coupling we water and ical he and ical he and ical he we asis cours asis provide asis sette pio a safe pio a safe pio a safe pio a safe pio a safe pio asis setting asis setting | <pre>Lis minutes. of high if intervention in the intervention of the intervention of the intervention of the intervention of the state of the intervention intervention of the state of the intervention intervention of the state of the intervention of the intervention of the bight intervention of the intervention of the interv</pre> | <pre>price and a second a seco</pre> | (ical Maip 15 area (tabus to the second of |
| help, B irrisation artesse a becken VI becken VI becken VI becken VI skin. B reserve consult skin. B reserve reserve consult skin. VI becken VI skin. B reserve consult skin. VI becken VI becken VI becken VI reserve consult skin. VI becken | <pre>press Flash w ion persists hared clothin or affected. Precastors by ion in the second second in a light second second in the second second second second second in the second second second second second second second second second in the second secon</pre> | (1) evice C = State the | ir et lanz couplig wi modical he modical he give wate modi- me and the a helf-co a helf-co ations. as helf-co ations. as helf-co ations. helf | 1.1. Minutes, of Biffered area biffered area ready and a second area ready and a second area (a cleaning per- trained respire a firm for disp be provided and rr to area of a big liquid. Camys be follow Measures in 18 | tain medic solth with we <u>persiel</u> nin medic pilled hi rotal in a meal in a meal in a meaturi alectric of. | (ical Maig Af (ical Maig Af Art Jackson, compared work and the second second and the second second second and second second second accordance with a neurophane second |
| heip, B irritati contanti arfess a hetter VI hetter VI skin, B hetter VI skin, B hetter VI consult federal arfest condicts federal federal condicts federal f | <pre>press flash.w insperials hated clashi us affected. - Precautions by hearing light hearing light hearing hearing light hearing light heari</pre> | (c), weiter f. Skare the op. obtain. Ingestion: faith Handling is Researd of weiter disposi- centre dispo- incial many writes of ig waite dispo- incial many writes of ig waite dispo- ter disposi- tion disposi- | rr at least coupling we have needed he medical he and the medical he have a safe plus a sa | 1.1. minutes, or a first of a | tain medic solth with we <u>persiel</u> nin medic pilled hi rotal in a meal in a meal in a meaturi alectric of. | (ical Maig Af (ical Maig Af Art Jackson, compared work and the second second and the second second second and second second second accordance with a neurophane second |
| help, B irrisation artesse a becken VI becken VI becken VI becken VI skin. B reserve consult skin. B reserve reserve consult skin. VI becken VI skin. B reserve consult skin. VI becken VI becken VI becken VI reserve consult skin. VI becken | yes, Cash y compare site of the second seco | Ith write the Backst block og obtain. Ispertion: Subwith Mandbing in Present of Sub- instantion of the presence of the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith | rr at least coupling we have needed he medical he and the medical he have a safe plus a sa | <pre>LiseBootes. of LiseBootes. of LiseT.irstNation r to drink. dependent LiseT.respire e firm for disp for Cleanup per firm for disp for to arguing lised respire lised. Computed and DespireDumbed and Lised. Lise</pre> | tain med s with w <u>period</u> pilled his coal in a solution while coal in a solution while solution while | (ical Maip 15 area (tabus to the second of |
| help, B irrisation artesse a becken VI becken VI becken VI becken VI skin. B reserve consult skin. B reserve reserve consult skin. VI becken VI skin. B reserve consult skin. VI becken VI becken VI becken VI reserve consult skin. VI becken | <pre>press flash.w insperials hated clashi us affected. - Precautions by hearing light hearing light hearing hearing light hearing light heari</pre> | Ith write the Backst block og obtain. Ispertion: Subwith Mandbing in Present of Sub- instantion of the presence of the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith | rr at least coupling we have needed he medical he and the medical he have a safe plus a sa | 1.1. Minutes, of Minister and Minutes, of P to drink, offi- r to drink, offi- r and drink, offi- r drink, offi- trained regime a firm for disp be grounded and mr to provid the provide the liquid. Dressretion is follow preservation is for drink preservation. | tain med s with w <u>period</u> pilled his coal in a solution while coal in a solution while solution while | (ical Maig Af (ical Maig Af Art Jackson, compared work and the second second and the second second second and second second second accordance with a neurophane second |
| help, E. Irrisel contact attack leather VI leather VI states states | yes, Each y competencies (2021), competencies (2021), exception (20 | Ith write the Backst block og obtain. Ispertion: Subwith Mandbing in Present of Sub- instantion of the presence of the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith | rr at least coupling we have needed he medical he and the medical he have a safe plus a sa | Liselandes of Liselandes of a friendes of the drink, our tendes of the drink, our tendes of tendes of tendes of tendes of tendes of tendes of tendes tend | tain med s with w <u>period</u> pilled his coal in a solution while coal in a solution while solution while | (ical Maig Af (ical Maig Af Art Jackson, compared work and the second second and the second second second and second second second accordance with a neurophane second |
| help, E irritati continues status s | yes, Each y competencies (2021), competencies (2021), exception (20 | Ith write the Backst block og obtain. Ispertion: Subwith Mandbing in Present of Sub- instantion of the presence of the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith the subwith | rr at least coupling we have needed he medical he and the medical he have a safe plus a sa | Liselandes. of Liselandes. of ing if irrelands ing if irrelands ing if irrelands of cleanup per tailed respire tailed respire be grounded and be grounded and be founded be fou | tin medi pilled in pilled in p | (101) Avia 14 (101) Avia 14 (101) Avia (101) Avia (1 |
| help, B. Irrise, S. Contaction and S. Section VI Section VI S | yman Exactly of the second sec | <pre>ish.weiter f face.the face of a sector face</pre> | <pre>pr at lease coupling we medical he and/cal he and/the medical he response a state pic a set pic a set</pre> | Line delander, or Line and the second second r to delan, out del cleanage per del cleanage per to line registre a firm for disp be provide and r do veride and he ispaid del cleanage del cleanage be provide and he ispaid clean clean del cleanage del cle | pilled is pilled is | (ical Maig Af (ical Maig Af Art Jackson, compared work and the second second and the second second second and second second second accordance with a neurophane second |
| helps B irrise Vi sciential Status Baction VI Baction VI Baction VI Baction VI Bactor VI Bactor VI Bactor VI Constants Const Const Constants | yman Easth as the second seco | <pre>ish.weiter f face.the face of a sector face</pre> | <pre>pr at lease coupling we medical he and/cal he and/the medical he response a state pic a set pic a set</pre> | Liselandes. of Liselandes. of ing if irrelands ing if irrelands ing if irrelands of cleanup per tailed respire tailed respire be grounded and be grounded and be founded be fou | pilled is pilled is | (101) Avia 14 (101) Avia 14 (101) Avia (101) Avia (1 |
| heijo B irrital contaction frances factors of factors of protects intern a protects intern a pro | yman Easth as the second seco | <pre>ish.weiter f face.the face of a sector face</pre> | <pre>pr at lease coupling we medical he and/cal he and/the medical he response a state pic a set pic a set</pre> | i i discrete di la cinetta | pilled in well pilled in polled in maal in a maal i | (101) Avia 14 (101) Avia 14 (101) Avia (101) Avia (1 |

SECTION VI: HEALTH HAZARD DATA

| Route(s) of Entry: | Inhalation? | Skin? | Ingestion? |
|--|---|---|---|
| | Yes | Yes | Yes |
| Health Hazards (Acute and C | Chronic) | | |
| Acute LD ₅ | 0 (oral rat) = 3,100 m | ng/kg. Inhalation: lung ir | ritation, central |
| nervous system | n effects (dizziness am | nd headaches). Skin: irrit | tation, rashes, |
| dermatitis. Ey | es: irritation, rednes | ss, pain. | |
| Carcinogenicity: | NTP? | IARC Monographs? | OSHA Regulated? |
| | No | No | No |
| Signs and Symptoms of Ex | xposure | | |
| | | | |
| • • • | • | tract, coughing, headach | e, nausea. Skin: |
| Inhalation: irri | itation of respiratory | rtract, coughing, headach ation, pain, conjunctivit | - |
| Inhalation: irr dryness, redness | itation of respiratory | ation, pain, conjunctivit | - |
| Inhalation: irr dryness, redness | itation of respiratory s, rashes. Eyes: irrit | ation, pain, conjunctivit | - |
| Inhalation: irr: dryness, redness Ingestion: abdor Medical Conditions | itation of respiratory s, rashes. Eyes: irrit | ation, pain, conjunctivit vomiting. | - |
| Inhalation: irri dryness, redness Ingestion: abdor Medical Conditions Generally Aggravated by E | itation of respiratory s, rashes. Eyes: irrit minal spasms, nausea, xposure None known. | ation, pain, conjunctivit vomiting. | is (redness). |
| Inhalation: irri dryness, redness Ingestion: abdor Medical Conditions Generally Aggravated by E Emergency and First Aid P | itation of respiratory s, rashes. Eyes: irrit minal spasms, nausea, xposure None known. Procedures Inhalation: m | ation, pain, conjunctivit vomiting. | is (redness). oxygen, obtain |
| Inhalation: irri dryness, redness Ingestion: abdor Medical Conditions Generally Aggravated by E Emergency and First Aid P | itation of respiratory s, rashes. Eyes: irrit minal spasms, nausea, xposure None known. Procedures Inhalation: m | ation, pain, conjunctivit vomiting. ove to fresh air, provide | is (redness). oxygen, obtain |
| Inhalation: irri dryness, redness Ingestion: abdor Medical Conditions Generally Aggravated by E Emergency and First Aid P medical help. Ey if | itation of respiratory s, rashes. Eyes: irrit minal spasms, nausea, xposure None known. Procedures Inhalation: m yes: flush with water | ation, pain, conjunctivit vomiting. ove to fresh air, provide | oxygen, obtain obtain medical help |
| Inhalation: irri dryness, redness Ingestion: abdor Medical Conditions Generally Aggravated by E Emergency and First Aid P medical help. Ey if irritation perse | itation of respiratory s, rashes. Eyes: irrit minal spasms, nausea, xposure None known. Procedures Inhalation: m yes: flush with water ists. Skin: thoroughly | ation, pain, conjunctivit vomiting. ove to fresh air, provide for at least 15 minutes, | is (redness). oxygen, obtain obtain medical help water, remove |

This section in general describes any important health information relating to the hazardous substance or its components. Symptoms resulting from acute and chronic (low-level exposure over an extended period of time) overexposure are listed if available. Epidemiological data are provided if pertinent.

- < Routes of entry. This information identifies the relevant route of entry into the body which may cause harm. The preparer must use knowledge of physical properties of the substance and how it usually is handled to judge whether inhalation, skin and ingestion are significant routes of exposure. This information suggests what types of personal protective equipment, for example gloves, respirators, or both, are needed.
- Health hazards. This information includes known toxicity data from animal tests and from what is known about human health effects. It should address recognizable symptoms by route of exposure so that workers will know if they are being overexposed. This section also may contain other more comprehensive toxicity data, such as the representative results of toxicological studies conducted with the material or its listed components, usually in rats, mice or rabbits.

The LD50 (Lethal Dose to 50 percent), if given, is the single dose of the material which on the basis of laboratory tests is expected to kill 50 percent of a group of the test animals. The LD50 usually is expressed as milligrams or grams of material per kilogram of animal body weight (mg/kg or g/kg). The material may be administered by mouth (oral) or applied to the skin (dermal or cutaneous).

The LC50 (Lethal Concentration to 50 percent), if given, is the concentration of the material in air which on the basis of laboratory tests is expected to kill 50 percent of the test animals when administered as a single exposure (usually one or four hours). The LC50 is expressed as parts of material per million parts of air, by volume (ppm) for gases and vapors, or as micrograms of material per liter of air (ug/l) or milligrams of material per cubic meter of air (mg/mm3) for dusts and mists.

The LD50 and LC50 values are intended only to provide an estimate of the relative degree of toxicity associated with a particular material. They should not be used in estimating any absolute level of intake or exposure that might be safe or unsafe for humans.

Relative Toxicity Levels

| Term | LD50-Rat <u>Single Oral Dose</u> | Probable Lethal <u>Dose for Humans</u> |
|---|---|---|
| Extremely toxic Highly toxic Moderately toxic Slightly toxic Practically non-toxic Relatively harmless | 1 mg/kg or less 1 to 50 mg/kg 50 to 500 mg/kg 500 to 5,000 mg/kg 5,000 to 15,000 mg/kg 15,000 mg/kg and up | Less than 1 gram Several grams 1 ounce _ pound 1 pound 1 quart |
| | Typical LD50 Values <u>Oral-Rat</u> | |
| | Nicotine Table Salt Citric Acid | 53 mg/kg 3,000 mg/kg 11,700 mg/kg |

- fi **Carcinogenicity.** Refers to whether any of the ingredients have been identified as potentially cancercausing by any of the agencies recognized as authorities in testing and classifying carcinogens. They are: National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC) and the federal Occupational Safety and Health Administration (OSHA), which develop regulations governing exposures to occupational carcinogens. If a carcinogenic substance is included in a product, it must be identified at concentrations of 0.1 percent or more (1,000 ppm) in Section II. In California, such materials also will be subject to Proposition 65.
- 1 **Signs and symptoms of overexposure.** This information identifies what signs or discomfort a person who is overexposed is likely to experience. This information describes a clear physical warning that a worker should know about to protect himself/herself from overexposure due to misuse or protective equipment failure. Workers should be taught to immediately respond to such warnings and not ignore them, or more serious harm may result.

Medical conditions generally aggravated by exposure. To the extent that this information is known, it should be included on the MSDS. For example, persons who are strongly allergic may experience an adverse reaction to certain chemicals. Those with respiratory problems may be more sensitive to irritating and corrosive gases and vapors.

 Emergency and first aid procedures. In general, this section gives emergency and first aid instructions for treatment of victims of acute inhalation, ingestion and skin or eye contact. It is not intended to take the place of professional medical assistance and treatment.

| Image: Description Image: Description Image: Description And State Control of the St | Section V R | antivity Data | | | | | | |
|---|--|---|--|--|---|--|--|--|
| more in the large state of the state of | Statuto N | insiality. | TR | Conditions to Rurod | | | | |
| Bernstein in Bernstein der Schlassen im Ber | | and in a | ++ | | | | | |
| | | | 1 | None | | | | |
| | | derials. | many ex | eact with one | nalogens. | NUS AND/OF | organic j | peroxides. N |
| Provide process of the second se | | | | | | a dinaida | | |
| | | tay-Conur | 11 | Conditions to Avoid | ALT: LATER | a annan an a | | |
| A A A A A A A A A A A A A A A A A | Pogneration | in the local | +-+ | | | | | |
| And of the second secon | | | 1 × 1 | None | | | | |
| And mark barryon 10 10 10 10 And Mark Barryon 10 10 10 10 And Mark Barryon 10 10 10 10 And Mark Barryon 10 | Section VI He | with Hazard 0 | | | | | | |
| and marked sectors and a sector of the sector and a secto | Routing of Entry | | 104 | | See. y | | | Question?" |
| Alternational Control (1994) and a second se | really Facanda (As | de and Overes) | | | | | a incides | |
| Alternational Control (1994) and a second se | ALC: NO. | water all | | odissienss at | d headache | #1. S%La: | igritatio | n, rashes, |
| an of several sectors in the several sector is an experimental sector is an experimation sector is an experimental sector | | is. Eyes: | irrit | stion, rednes | er, pain. | Adversaria (| | |
| Scheduler untersteile of preferences (1997), simplifying Machine Machine Machine (1997), and a scheduler (1997), simplifying Machine (1997) | | | | No | | No | | |
| Light 1 | Eigne and Sumpton Einhalt at Lost | - Sevicat | ine of | f respiratory | tract. co | uphing, her | daths, na | sees. shin- |
| A Constraint Processing Constraints of the second sec | dryness, r | wdness, r | ashes. | Syes: Leelt | ation, pair | a, conjunct | Svitle (r | (edness) . |
| <pre>network between between the second seco</pre> | Ingest Lon- | 20-004-014 | 1 4944 | NR. 181848. | PORT LEG. | | | |
| Varis, Barra Marka, Marka Marka, Janki H, Wang M, Kang M, Wang M, Kang M, K | | | | | | | | |
| man 14. Insertion 16 Min defining on 16 months of the second se | | | | | | | | |
| man 14. Insertion 16 Min defining on 16 months of the second se | Emergency and Fil | ed by Expendent # And Proceedury | ** 142 | talation: mon | e Lo fresh | air. provi | de exyper | , obtain met |
| man 14. Insertion 16 Min defining on 16 months of the second se | Emergency and Fe help. Eyes | e Aut Promiter | in Ini | alation: mov | e to fresh sant 15 mil | air, provi | ide oxygen in medica | , obtain mei i help if |
| man 14. Insertion 16 Min defining on 16 months of the second se | help. Eyes irritation contaninat | e Aut Promite Einsh y persists ed clothi | 4 143 (153, 93 (153, 93 | talation: mon eter for at 1 thereinghip stain medical | to fresh sast 15 million wash affe help if it | air. provi sutes, obto cted areas rritation p | ide oxygen in medica with wate |), obtain mei i help if ir, remove ir large body |
| An other concentration to see of the second | Emergency and Fe help. Eyes Lirritation contaning | <pre># And Proceeding Grant w geralate</pre> | a Lak (15h wa . Ekis ng. ob Inger | talation: moveler for at 1 t: Charowyhle train medical stion: give w | to fresh sast 15 min wash affe help if in ater to dr | air. provi nutes, obto rited areas rritation p ins, obtain | ide oxygen in medica with wate menials o medical | , obtain mei i kalp if ir, remove ir large body belp. |
| Called a series and a series of particular series of the s | help. Eyes irritation contaminat areas are | ed clothic affected | itth wa ng. ob Ingen | eler for at 1 to thoroughly train medical stion: give w | to fresh sast 15 ml/ wash affe help if 1 ster to dr | air, provi sures, obt; cted areas rritation ; ink, obtain | ide oxygen in medica with wate menials o medical | , obtain me il halp if ir, remove <u>r large body</u> help. |
| A CONTRACT AND A CONT | help. Eyes irritation contaminat areas are | flush x persists ed clothic affected | LLE WILLI | ter for at 1 to Checoughly stain medical stion: give w | e to fresh and 15 mil wash affe help if i ater to dr | air. provi sures, obt; tted areas rritation j ink, obtain | in medica with sedica with set erginis | , obtain mei i help if ir, remove ir large body help. |
| no Description of Alexander Alexander Alexander Free Free Alexander La Association (SAL) A second and a secon | help. Eyes irritation contaminat areas are bection VI - P | ed clothin affected | LLLA war ng. of Ingen Safe H | eler for at 1 to Charoughly btain medical stion: give w landing and Use | wast 15 ml | tited areas rritation j ink, obtain | vith wate with wate menical medical | i help if ir, remove or large body help. |
| no Description of Alexander Alexander Alexander Free Free Alexander La Association (SAL) A second and a secon | help. Eyes irritation contaninat areas are Section VI - P Dege to be Taxet Collect. Is | - frish w persists ed clithin affected meautions for n Cass Materia aking lip | r Safe H | eter for at 1 - Churouphip train medical stion: give w landing and the met of toner 5 seatable co | wash affe help if in ater to dr | Absorb spil | in medica with wate medical is medical | d help if r. remove (r. arge body help. d in mand to d wear |
| The second secon | help. Eyes irritation contaning areas are Section VI - P Description VI - P | - frish w persists ed clithin affected meautions for n Cass Materia aking lip | r Safe H | eter for at 1 - Churouphip train medical stion: give w landing and the met of toner 5 seatable co | wash affe help if in ater to dr | Absorb spil | in medica with wate medical is medical | d help if r. remove (r. arge body help. d in mand to d wear |
| Table 22. See all less applications. The provide an electronic structure of the second structure of th | help. Eyes irritation contatinat areas are Destin VI - P Dess u De Tanat Collect is intern alw protective skin. Rev | Cash a persists ed circhi affected recautions for recautions for r | r Safe H | eter for at 1 - Churouphip train medical stion: give w landing and the met of toner 5 seatable co | wash affe help if in ater to dr | Absorb spil | in medica with wate medical is medical | d help if r. remove (r. arge body help. d in mand to d wear |
| Namera bis an bedge ben ben form and be provided and interstein() model (s a first or expression of the second sec | help. Eyes irritation container areas are Destur VI - P Dess the Tanon Collect is inert abso protective skin. Setu | Elash x persists ad clothi affected. recautions for a Case Monda aking lip aking lip rises and clothing row all bio | r Safe H r Safe H r Safe H r Safe H r Safe H r Safe H r Safe H | <pre>start for at in theoremphip prain medical stion: give w anding and Use set at the set at the set at the set at the of ignition.</pre> | said 15 mil wash affe help if i ater to dr ntainers, place, cle -contained | Absorb api respirator Absorb api anup person respirator | in medica with wate menical i medical usel show r. Avaid (| d heip if e. remove e. remove e. large body heip. d in mand to d wear contact with |
| Construction of the second secon | help. Eyes irritation containey areas are Sector VI - P Dega to To Tono Collect Lo start also protective skin. Earn Mark Dapone M Conservant | Elisth x persists ed clothi affected. recautions for in Case Manda Aking Ilip ribect and clothing row all bi mod | CITAL VE A BALANA A BALANA A BALANA I A BALANA I | eter for at 1 - Chicoughtp tion: give w anding and the met of tother t seatable co to Co a shift of ignition. | wash affer wash affer help if i ater to dr ntainers. place. Cle -contained | Absorb api respirator Absorb api anup person respirator | in medica with wate menical i medical usel show r. Avaid (| d heip if e. remove e. remove e. large body heip. d in mand to d wear contact with |
| And branch hopices practices should charge be followed. Most of - Good Wannessen Management and an entry of the state of the state of the state of the state management and an entry of the state of the state of the state of the state of the state management of the state of the state management of the state of th | halp, Eval traitation contaction areas are Section VI - P Section VI - P | Fish x persists ed clothi affected. n Can Manual Alig Lip rises and clothing rises all bo prod licensed. rtate and | CITA VE AND AND AND AND AND AND AND AND AND AND | the for at 1 is theroughly train medical stion: give w landing and the media forme to a safe toding a self of lysition. disposal med repulations | wash affe bein if i hein if i ater to dr stainers. place. Cle -contained wice firm | hores, obtain rritation J ink, obtain hheorh spli anup person respirator for dispon- | in medical with ware medical i medical usel show r. Ausid r | <pre>cl heip if r, remove r large body heip. d in mand n d wwar contact with refance with</pre> |
| And branch hopices practices should charge be followed. Most of - Good Wannessen Management and an entry of the state of the state of the state of the state management and an entry of the state of the state of the state of the state of the state management of the state of the state management of the state of th | halp, Eval traitation contaction areas are Section VI - P Section VI - P | Fish x persists ed clothi affected. n Can Manual Alig Lip rises and clothing rises all bo prod licensed. rtate and | CITA VE AND AND AND AND AND AND AND AND AND AND | the for at 1 is theroughly train medical stion: give w landing and the media forme to a safe toding a self of lysition. disposal med repulations | wash affe bein if i hein if i ater to dr stainers. place. Cle -contained wice firm | hores, obtain rritation J ink, obtain hheorh spli anup person respirator for dispon- | in medical with ware medical i medical usel show r. Ausid r | <pre>cl heip if r, remove r large body heip. d in mand n d wwar contact with refance with</pre> |
| Solar Arrenal burgine practice shold a Gorge Ke fillowith Solar Arrenal burgine practice for shold a Gorge Ke fillowith Solar Arrenal burgine practice for shold a Gorge Ke fillowith Solar Arrenal burgine practice for shold a Gorge Ke fillowith Solar Arrenal burgine practice for shold a Gorge Ke fillowith Solar Arrenal burgine fillowith | halp, Eval traitation contaction areas are Section VI - P Section VI - P | Fish x persists ed clothi affected. n Can Manual Alig Lip rises and clothing rises all bo prod licensed. rtate and | CITA VE AND AND AND AND AND AND AND AND AND AND | the for at 1 is theroughly train medical stion: give w landing and the med a forme to a safe toding a self of lysition. disposal med repulations | wash affe bein if i hein if i ater to dr stainers. place. Cle -contained wice firm | hores, obtain rritation J ink, obtain hheorh spli anup person respirator for dispon- | in medical with ware medical i medical usel show r. Ausid r | <pre>cl heip if r, remove r large body heip. d in mand n d wwar contact with refance with</pre> |
| All of the second secon | help, Ersitation contamination areas are bection VI - P limit to Tame Collect in Tame Collect in Tame Collect in Tame Collect in Tame Consult a Consult a Co | . Electrony persists and clerking affected. weakfore by a Case Manwa a Case Manwa a Case Manwa a Case Manwa a Case Manwa clerking a clerking a clerking | (13), ver Balando Ingent Safe H Safe H Safe H Safe H Ingent Ling Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Value Nortes Value Val | etc. Chicosophip prain medical etclose etclose etclose give we andiog and the end of prove search and control of the intervention of important etclose disposal set regulations disposal set intervention to intervention to class 18 fla | each 15 mil mash affe help if i ater to dr place. Cle .contained wice firm wice firm at be prov order to a mable lig | notes, obta- tred areas rritation ink, obtain house person respirator for dispon- noted and e rrid statio note small wid. | in medical with ware medical i medical usel show r. Ausid r | <pre>cl heip if r, remove r large body heip. d in mand n d wwar contact with refance with</pre> |
| engentations, film approved reminister with organic yange filter, black das en Festives for high consentrations - to an approved to a set | help, Ersitation contamination areas are bection VI - P limit to Tame Collect in Tame Collect in Tame Collect in Tame Collect in Tame Consult a Consult a Co | . Electrony persists and clerking affected. weakfore by a Case Manwa a Case Manwa a Case Manwa a Case Manwa a Case Manwa clerking a clerking a clerking | (13), ver Balando Ingent Safe H Safe H Safe H Safe H Ingent Ling Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Nortes Value Value Nortes Value Val | etc. Chicosophip prain medical etclose etclose etclose give we andiog and the end of prove search and control of the intervention of important etclose disposal set regulations disposal set intervention to intervention to class 18 fla | each 15 mil mash affe help if i ater to dr place. Cle .contained wice firm wice firm at be prov order to a mable lig | notes, obta- tred areas rritation ink, obtain house person respirator for dispon- noted and e rrid statio note small wid. | in medical with ware medical i medical usel show r. Ausid r | <pre>cl heip if r, remove r large body heip. d in mand n d wwar contact with refance with</pre> |
| Long Donal Long Donal Long Donal Mediation in contract any planet in Section in contract any planet Mediation (server) Mediation (server) Medi | help, Ernistion Lirritation contatination attain are becling to the becling to the postation | field of pression of pression of the pression | CITAL NET CONTRACTOR OF CONTRA | etc. Charactory for an in- the charactory for a prain medical prain and protection of the sector protection of the sector protection of of lighting a self of lighting a self of lighting a self of lighting and regulations. Support of the important of the important of the characteristics of class 18 Fis- antices should be setting a should be class 18 Fis- antices should be should be setting a should be class 18 Fis- antices should be should be setting a should be should be should be setting a should be should be should be should be setting a should be should be should be should be should be setting a should be should be should be should be should be setting a should be should | mart 15 mil mark affe help if i ater to de states to de states to de vice firm wice firm order to a outer to a outer to a outer to a outer to a outer to a | hores, obj. Teed areas rritation 3 ink, objects Absorb spit abup person respitato for dispose respitato respitato respitato adda and a resid static adda sealt wid. a followed | <pre>in medica vick with wate with wate wate wate wate with wate wate wate and the second at the sec</pre> | <pre>il height in prove or premove or premove or height in the prove of an end of the prove of an end of the prove of an end of the prove of the prove of the prove of the prove of the prove of the prove of the prove of the prove of the prove of the prove of the prove of the p</pre> |
| Regulard for high subsections. De Class 1, Orong 0; fans must be dont participation. Websaud Genet User State 1, Orong 0; fans must be dont participation. User State 1, Orong 0; fans must be dont participation. User State 1, Orong 0; fans must be dont participation. User | help, Ermitation Lirritation contatination areas are Sector VI - P Depine VB - P Collect along printers | field.x. field.x.< | Cliff, we cliff with the cliff of the cliff | etc. fine out of the second | east 15 mi baip 17 mi baip 17 m ater to dr mainers place.cie -contained vice firm at be pro- order 50 m order 50 m order 10 m order 10 m order 10 m | hurse, obt. tied areas, ritation ; ins., obtain Absorb spil shup person respiration for dispose mid dation adds and s mid dation ad followed tion is being tion is being | <pre>in medica with wate militar i malitar i neal show , August , August so and so and and so and so and and so and and so and and and and and and and and and and</pre> | c) height of r, remove of large holy height d in sand n d wear contact with ordance with indance with indance with indance with ty bounded to force away is in approve to higher |
| Bestinisi (seek) Other humotor Stores Ear Provise Chemics: goggies and/or face shield. Bio Destro, Chemics: goggies and/or face shield. | help, Ermitetion Lipitation contacinti di un contacinti di un contacinti di lattata atta lattata atta lattata lattata atta lattatata lattatatatata lattatatatatatatatatatatatatatatatatata | Frank w persists persists p | citta yes gan a secondaria yes r Safe H anges r Safe H anges r Safe H anges r Safe H anges r Safe H anges yes r Safe H anges yes r Safe H anges r S | etc. fine out of the second | east 15 mi baip 17 mi baip 17 m ater to dr mainers place.cie -contained vice firm at be pro- order 50 m order 50 m order 10 m order 10 m order 10 m | hurte, obt. ticed areas pritation ; have obtain have person respirator for dispose aded and aded and add and ind. a followed tion is being organiz, ve there is being there is | <pre>in medica with wate militar i malitar i malitar ind liqui malitar approximation over PHL. 3 per Films over PHL. 3</pre> | (c) here 2 is r removed of harder hords halp. (c) is made of the second of our and with ordented with ty bounded to from analy. (c) is approved in higher r should be. |
| Region Groups former Region Change former | help, Ermitetion Lipitation contacinti di un contacinti di un contacinti di lattata atta lattata atta lattata lattata atta lattatata lattatatatata lattatatatatatatatatatatatatatatatatata | field w field w | <pre>clift, we clift, we r deter r det</pre> | etc. Chicosyllip in Chicosyllip etc. | and 11 ml mash after haip if 1 ater to dr analosry. place. Cle -contained vice firm. with be grow ources. Ma model 10 grow ources. Ma model 10 grow ources. Ma model 10 grow ources. Ma content mask of the content mask of the co | hurte, obs. toted areas rritation ; have been in a have been in a have been in a for dispose oded and e wild station all shall have been in have | <pre>in medica matika : matika : matika : medical ind limatika : not in acco limatika : not in acco limatika : not PEL : not PEL : not restrict electrica : orce</pre> | (c) here 2 is r removed of harder hords halp. (c) is made of the second of our and with ordented with ty bounded to from analy. (c) is approved in higher r should be. |
| Butter: Chemical goggies and/or face shield. | help, Ermitetion Lipitation contacinti di un contacinti di un contacinti di lattata atta lattata atta lattata lattata atta lattatata lattatatatata lattatatatatatatatatatatatatatatatatata | field w preside defected recarding ty case Manna defected recarding ty case Manna define line recarding ty reserve define line recarding ty reserve define line recarding ty re | All and a second | <pre>star.st.ic.st.ar.st.ic.st.ic.sc.ar.st.ic.st.ic.sc.ar.st.ic.st</pre> | and 11 ml mash after haip if 1 ater to dr analosry. place. Cle -contained vice firm. with be grow ources. Ma model 10 grow ources. Ma model 10 grow ources. Ma model 10 grow ources. Ma content mask of the content mask of the co | hurte, obt. toted areas pritation ; ins. obtain hhoorh spii anup person respirator for dispon- aded and si respirator for dispon- aded and si for dispon- ded and si for dispon- aded and si for dispon- tion is bri- organiz, va for is bri- for is | <pre>in medica matika : matika : matika : medical ind limatika : not in acco limatika : not in acco limatika : not PEL : not PEL : not restrict electrica : orce</pre> | (c) here 2 is r removed of harder hords halp. (c) is made of the second of our and with ordented with ty bounded to from analy. (c) is approved in higher r should be. |
| Butter: Chemical goggies and/or face shield. | help, Ermitetion Lipitation contacinti di un contacinti di un contacinti di lattata atta lattata atta lattata lattata atta lattatata lattatatatata lattatatatatatatatatatatatatatatatatata | field w preside defected recarding ty case Manna defected recarding ty case Manna define line recarding ty reserve define line recarding ty reserve define line recarding ty re | All and a second | <pre>star.st.ic.st.ar.st.ic.st.ic.sc.ar.st.ic.st.ic.sc.ar.st.ic.st</pre> | and 11 ml mash after haip if 1 ater to dr analosry. place. Cle -contained wice firm. with be grow ources. Ma model 10 grow ources. Ma model 10 grow ources. Ma model 10 grow ources. Ma content mask of the content mask of the co | hurte, obt. ticed areas pritation ; ins. obtain hhoorh spii anup person respirator for dispon- aded and si respirator for dispon- aded and si respirator for dispon- ded and si for dispon- tion is bri- organiz, va for is bri- for is b | <pre>in medica matika : matika : matika : medical ind limatika : not in acco limatika : not in acco limatika : not PEL : not PEL : not restrict electrica : orce</pre> | (c) here 2 is r removed of harder hords halp. (c) is made of the second of our and with ordented with ty bounded to from analy. (c) is approved in higher r should be. |
| Der Fueste Conviger Deeren Tyre wash fourtains, safety showers, barrier crease, etc. Hohlower Bonders | help, Ermitetion Lipitation contacinti di un contacinti di un contacinti di lattata atta lattata atta lattata lattata atta lattatata lattatatatata lattatatatatatatatatatatatatatatatatata | field w preside defected recarding ty case Manna defected recarding ty case Manna define line recarding ty reserve define line recarding ty reserve define line recarding ty re | All and a second | <pre>star.st.ic.st.ar.st.ic.st.ic.sc.ar.st.ic.st.ic.sc.ar.st.ic.st</pre> | and 15 ml height 15 ml height 1 ml and affect to df -contained with firm with firm with firm with a pro- contained contained a strong to the concentra- soor with d always b | hurse, obs. Code areas, code areas, hurses, obtain hurses, obtain hurses, obtain hurses, obtain hurses, obtain hurses, obtain hurses, hurses, obtain hurses, obtain | <pre>in Medica With wath wath wath selful ind light selful ind light selfu</pre> | 1 height for the second sec |
| The finance functions. A static property and the fitter of the | help, Egns leveladde | Clash w persists ad clashi vecanics for vecanics | Lish we shall be shal | <pre>star. fir. of</pre> | and 15 ml height 15 ml height 1 ml and affect to df -contained with firm with firm with firm with a pro- contained contained a strong to the concentra- soor with d always b | hurse, obs. Code areas, code areas, hurses, obtain hurses, obtain hurses, obtain hurses, obtain hurses, obtain hurses, obtain hurses, hurses, obtain hurses, obtain | <pre>in Medica With wath wath wath selful ind light selful ind light selfu</pre> | 1 height for the second sec |
| | help, Eggs help, Eggs territation territa | finally a parallela and final and a clock of a clo | (11) with the second se | <pre>city_first_d</pre> | and 11 all bein 11 all seen to dr anter to dr anter to dr anter to dr ant be pro- contained wice firm wice firm wice firm at be pro- contained d always h contentra stor with d always h | hute, obj. Cod areas, code areas, code areas, huser, huser, respirator for diagons for diagons for diagons for diagons for diagons for diagons for diagons for diagons for diagons for solution for | <pre>in Medica With wath wath wath selful ind light selful ind light selfu</pre> | 1 height for the second sec |
| #23 Guerner/Policy Office 1981 - 181-000 | help, Eggs help, Eggs territation territa | finally a parallela and final and a clock of a clo | (11) with the second se | <pre>city_first_d</pre> | and 11 all bein 11 all seen to dr anter to dr anter to dr anter to dr ant be pro- contained wice firm wice firm wice firm at be pro- contained d always h contentra stor with d always h | hute, obj. Cod areas, code areas, code areas, huser, huser, respirator for diagons for diagons for diagons for diagons for diagons for diagons for diagons for diagons for diagons for solution for | <pre>in Medica With wath wath wath selful ind light selful ind light selfu</pre> | 1 height for the second sec |

SECTION VII: PRECAUTIONS FOR SAFE HANDLING AND USE

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

Collect leaking liquid in sealable containers. Absorb spilled liquid in sand or inert absorbent and remove to a safe place. Cleanup personnel should wear protective clothing, including a self-contained respirator. Avoid contact with the skin. Remove all sources of ignition.

Waste Disposal Method

Consult a licensed waste disposal service firm for disposal in accordance with all federal, state and local regulations.

Precautions to Be Taken in Handling and Storing Drums must be grounded and electrically bonded to the receiving vessel while dispensing in order to avoid static sparks. Store away from

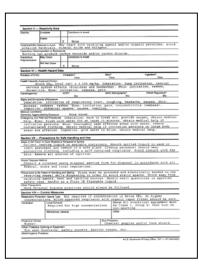
oxidizing agents, heat and ignition sources. Handle small quantities in approved safety cans. Handle as a Class 1B flammable liquid.

Other Precautions

Good personal hygiene practices should always be followed.

This section describes methods for the proper handling of spills and leaks, disposal and safe storage.

- < **Spill and leak procedure.** Methods for controls and cleanup of spills or leaks. Appropriate materials, equipment and personal protective clothing also are generally listed.
- > Waste disposal. Accepted methods for disposing of excess, used or spilled material in order to comply with government requirements.
- fi **Precautions to be taken in handling and storing.** Based on the physical properties of the material and reactivity data, this section should include storage temperatures, containers, dispensing procedures and other information.
- fl **Other precautions.** This information relates to miscellaneous materials, handling and safety equipment, and procedures such as personal hygiene.



SECTION VIII: SPECIAL PROTECTION INFORMATION

Section VIII — Control Measures

| | biratory Protection (Specify Type) Not required if concent oncentrations, NIOSH-approved respirator with tilation Local Exhaust Required for high concentrations. | | 5 | |
|--|--|--|---|--|
| | Mechanical (General) | | Other | |
| Protective Gloves Rubber. | | | Eye Protection Chemical goggles and/or face shield. | |
| Other Protective Clothing or Equipment Eye-wash fountains, safety showers, barrier creams, etc. | | | | |
| Work/Hygienic Pract | tices | | | |

- < **Respiratory protection.** This section provides information and general statements relevant to the need and type of respiratory protection that should be used while handling the material.
- Ventilation. Describes the type of ventilation recommended, such as local exhaust hoods or vents at the source of the vapors or dust, as well as general ventilation, which refers to general room ventilation. It also will state whether electrical equipment should be spark proof to safeguard against explosions if the material is flammable.
- fi **Protective gloves.** Describes when gloves should be worn and the materials from which they should be fabricated in order to give proper protection from the substance being handled.
- fl **Eye protection.** Describes the correct type of eye protection, such as safety glasses, chemical goggles, face shields.

Other protective equipment. Refers to the need for such items as protective garments, boots, aprons, eye wash fountains, safety showers.

 Work/hygienic practices. Include information such as whether clean lunch rooms should be provided, personal hygiene practices such as post-shift handwashing or showering, and soiled clothing/laundry handling procedures.

Other MSDS Information

Some MSDSs will include information that describes and categorizes the material in accordance with the U.S. Department of Transportation classification for purposes of safe packaging, handling and transportation. Other regulatory requirements also may be referenced.

Resources

Cal/OSHA Regulations (Title 8, California Code of Regulations);

Web site <http://www.dir.co.gov/samples/search/query.htm>

Airborne Contaminants, Section 5155 Body Protection, Section 3383 Eye and Face Protection, Section 3382 Foot Protection, Section 3385 Hand Protection, Section 3384 Hazard Communication, Section 5194 The Hazardous Substances List, Section 339 Head Protection, Section 3381 Injury and Illness Prevention Program, Section 3203 Regulated Carcinogens, Article 110, Sections 5200 et seq. Respiratory Protection, Section 5144

Cal/OSHA Publications and Web site http://www.dir.ca.gov:

DOSH Policy and Procedure Manual, P&P C-43 Hazard Communication Guide to Developing Your Workplace Injury and Illness Prevention Program (CS-1), April 1998 New Respirator Regulation Fact Sheet, Novemeber 1998 Workplace Injury and Illness Prevention Model Program For high-hazard employers (CS-1A), August 1995 For non-high hazard employers (CS-1B), August 1995 For employers with intermittent workers (CS-1CS), October 1996 For employers with intermittent workers in agriculture (CS-1CS Ag), January 1997

California Chamber of Commerce <http://www.calchamber.com>:

California Environmental Compliance Manual, 1997-98 Hazard Communication Handbook, 1997-98 Proposition 65 Handbook, 2nd ed., 1989

Nossaman, Guthner, Knox, and Elliot. Surviving Proposition 65, 1987

Cal/EPA Office of Environmental Health Hazard Assessment (OEHHA)

<http://www.oehha.ca.gov>:

Proposition 65 in Plain Language

Occupational Safety and Health Administration (OSHA) <http://www.osha-slc.gov>:

Hazard Communication Guidelines for Compliance, OSHA 3111, 1995 Instruction CPL 2-2.38D—Inspection Procedures for the Hazard Communication Standard, 1998 Supplement to California State Plan; Approval-62:31159-31181, 1997

National Advisory Committee on Occupational Safety and Health (NACOSH) http://www.osha-slc.gov/STLC/hazardcommunications/wgfinal.html:

Report to OSHA on Hazard Communication, 1996

Evaluation

Dear Reader,

We value and welcome your comments on the *Guide to the California Hazard Communication Regulation.* To better assist employers and employees, Cal/OSHA invites you to participate in a brief evaluation. Please copy this page and fax to (916) 574-2532 or mail to Cal/OSHA Education Unit, 2211 Park Towne Circle, Suite 4, Sacramento, CA 95825. **We thank you for your participation!**

| Yes | No | lease 🖌 and comment. Thank y | ои. |
|-----|----|--|--|
| | | to integrate the requirements activities? | nderstand why businesses that handle hazardous substances need of a hazard communication program in their everyday work |
| | | | |
| | | Did we miss any important haz If yes, what? | ard communication issues? |
| | | Develop a written hazard com Assess an existing hazard comr | in the guide encouraged you to: munication program for your workplace? nunication program? urrent hazard communication program? |
| | | 0 | ative, useful, and easy to understand? |
| | | | nent(s) regarding the text of any section of this guide? nd refer to specific page number(s), text, or section. |
| | | 5 | es (avoided accidents, reduced number of injuries, etc.) that you so, please provide your company name and a brief description. |
| | | | |

Acknowledgments

| | This document is a 2000 revised version of an earlier work by Cal/OSHA. Special thanks are due to the following professionals who contributed their expertise and support to the revision of this document: |
|-------------------------------|---|
| Revision and editing | Zin Cheung, Cal/OSHA Consultation Service, Education Unit, Sacramento, California |
| Editorial and peer review | Michael Alvarez, Cal/OSHA Consultation Service, Education Unit, Sacramento, California |
| | Bob Barish, Cal/OSHA Consultation Service, San Francisco, California |
| | Paul R. Burnett, Consultant/Trainer, Morgan Hill, California |
| | Richard DaRosa, Cal/OSHA Consultation Service, Sacramento, California |
| | Mary Grace Delizo, Cal/OSHA Consultation Service, San Diego, California |
| | Kelly Howard, Cal/OSHA Consultation Service, Santa Fe Springs, California |
| | Haifa Hughes, Cal/OSHA Consultation Service, Van Nuys, California |
| | Mary Jo Jensen, Cal/OSHA Consultation Service, Sacramento, California |
| | Dan Leiner, Cal/OSHA Consultation Service, Santa Fe Springs, California |
| | Warren Manchester, Division of Occupational Safety and Health, Sacramento, California |
| | Cindy Oshita, Office of Environmental Health Hazard Assessment, Sacramento, California |
| | Wende Wiltse, Divison of Occupational Safety and Health, San Diego, California |
| Additional assistance | Carl Foreman, UC Davis Medical Center, Sacramento, California |
| | Management, Progressive Circuits, Sacramento, California |
| Photographer | Bernadine Osburn, Cal/OSHA Consultation Service, Sacramento, California |
| Preparation of draft document | Bernadine Osburn, Cal/OSHA Consultation Service, Sacramento, California |

Cal/OSHA Consultation Programs

Toll-free number: 1-800-963-9424 • Internet: www.dir.ca.gov



Your call will in no way trigger an inspection by Cal/OSHA Enforcement.

- Voluntary Protection Program San Francisco, CA 94142 (415) 703-5272
- Research and Education Unit Sacramento, CA 95825 (916) 574-2528

