DOCUMENT RESUME

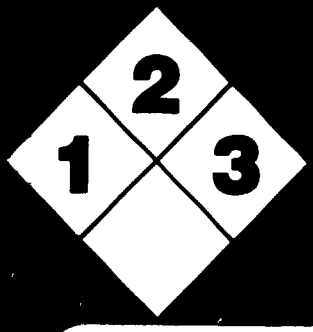
ED 270 300 SE 046 574

TITLE	Informing Workers of Chemical Hazards: The OSHA Hazard Communication Standard.
INSTITUTION	American Chemical Society, Washington, D.C.
PUB DATE	Apr 85
NOTE	17p.
AVAILABLE FROM	American Chemical Society, Department of Government Relations and Science Policy, 1155 16th Street, NW, Washington, DC 20036.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Accident Prevention; *Chemical Industry; Communications; *Environmental Standards; Federal Legislation; *Hazardous Materials; *Occupational Safety and Health; Public Health; *Safety; *Safety Education; Science Education
IDENTIFIERS	*Occupational Safety and Health Administration

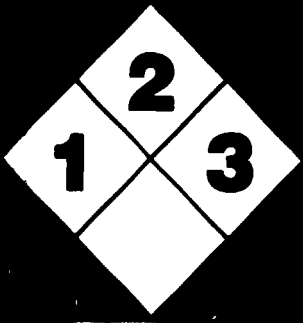
ABSTRACT

Practical information on how to implement a chemical-related safety program is outlined in this publication. Highlights of the federal Occupational Safety and Health Administrations (OSHA) Hazard Communication Standard are presented and explained. These include: (1) hazard communication requirements (consisting of warning labels, material safety data sheets (MSDS), and training programs); (2) hazard determination (clarifying evaluative procedures); (3) written communication program (specifying program requirements); (4) labels and other forms of warning (explaining the purposes and procedures of labeling); (5) material safety data sheets (listing the minimal requirements for all MSDS); (6) employee information and training (describing the basis of an employee training program); (7) trade secrets (delineating rights and limitations involving the chemical's identity); and (8) state and local governments' roles (reviewing the status of hazard communication laws). A glossary of terms related to the hazard communication standard is also provided. (ML)

Informing Workers of Chemical Hazards:



ers of emical rds:



Informing Workers of Chemical Hazards:

THE OSHA HAZARD COMMUNICATION STANDARD

Prepared by the Task Force on Occupational Health and Safety

American Chemical Society
Department of Government Relations and Science Policy
1155 16th Street, NW
Washington, D.C. 20036

This publication highlights the federal Occupational Safety and Health Administration's (OSHA) Hazard Communication standard. The booklet is for all users of chemicals, including those users who are not yet covered under the federal standard. It is intended to increase awareness of responsibilities under the standard and to convey practical information on how to implement a chemical related safety program.

This booklet was developed and written by the American Chemical Society's (ACS) Task Force on Occupational Health and Safety, Committee on Chemistry and Public Affairs, in cooperation with the Office of Federal Regulatory Programs, ACS Department of Government Relations and Science Policy.

INTRODUCTION

In 1983, OSHA promulgated a final occupational safety and health standard entitled "Hazard Communication" (29 CFR 1910.1200). This standard is intended to reduce the incidence of chemically-related occupational illnesses and injuries. It sets the minimum requirements employers must adhere to for communicating hazards to workers and thus is often referred to as a "right-to-know" law. States and local governments also may have hazard communication laws, some of which are broader in scope than the federal standard and may include additional requirements.

The federal standard requires chemical manufacturers and importers to assess the hazards of the chemicals which they produce or import, and to transmit the hazard information to the users of the chemicals. Furthermore, all employers having workplaces in a manufacturing division [Standard Industrial Classification (SIC) Codes 20 through 39] must provide information to their employees about hazardous chemicals in the workplace. This information is to be conveyed by means of "a hazard communication program including labels, material safety data sheets, training, and access to written records." The information supplied by manufacturers to employers should be comprehensive enough to allow employers to devise appropriate employee protection programs and to give employees the information they need to take steps to protect themselves.

Effective Dates: Chemical manufacturers and importers are required to label containers they ship and to provide material safety data sheets by November 25, 1985. Distributors are required to be in compliance by November 25, 1985. All employers covered by the standard are to be in compliance by May 25, 1986.

SCOPE AND APPLICATION

Chemical manufacturers and importers must evaluate all chemicals which they produce or import for chemical hazards. The Hazard Communication standard also requires distributors (including repackagers and formulators) and all employers in the manufacturing division, SIC Codes 20-39, to inform and train their employees about the hazards of chemicals found in the workplace. The federal standard applies to *all* chemicals which are ***known*** to be present in the workplace to which employees may be exposed under normal conditions of use, and to those chemicals to which they could be exposed in a foreseeable emergency.

The hazard information is to be communicated in three ways: 1) **warning labels,** 2) **material safety data sheets (MSDS),** and 3) **training programs.** [Laboratories are a special case as they are exempt from certain labeling and MSDS requirements (see shaded box on page 5).] One important point of the standard is that OSHA does not specify the labels, hazards, or training. Rather, it specifies the level of performance to be achieved. The employer has considerable discretion in deciding how to achieve the performance standards. Prudent attitudes and the use of prudent practices by the employer are implied by a performance-based standard of this type.

This standard does not require additional labels for chemicals that already must be labeled in accordance with other regulations such as the Food and Drug Administration's food additive regulations. Some substances such as tobacco and RCRA hazardous wastes are not covered at all.

The federal Hazard Communication standard will be implemented in all states except those that are state-plan states. State-plan states are those states which have been granted the authority by federal OSHA to assume responsibility for occupational safety and health issues. These states have their own OSHA-approved occupational safety and health plans. Under the federal Hazard Communication standard, state-plan states must have submitted by May 25, 1984 a hazard communication standard for approval by OSHA. Until a state standard is promulgated, federal OSHA will provide interim enforcement assistance as appropriate. The federal Hazard Communication standard preempts state or local laws in non-state-plan states. Moreover, it appears that such preemption applies only to those industries that are specifically covered by the OSHA standard. (For further discussion, see page 10.)

HAZARD DETERMINATION

A chemical may be hazardous by virtue of its physical properties or because of its toxic effects on health. The standard requires chemical manufacturers and importers to evaluate (not necessarily test) the chemicals they produce or import and to determine if the chemicals are hazardous [20 CFR 1910.1200(d)]. Users of chemicals can rely on the evaluation performed by the chemical manufacturer or importer or they can perform their own hazard determination.

The standard defines all terms required to perform a hazard determination and discusses specific health effects to be considered (29 CFR 1910.1200—Appendices A and B). To avoid controversy over whether a

The following is a list of available data sources that may be consulted when performing a hazard determination.

29 CFR Part 1910, Subpart Z, *Toxic and Hazardous Substances*, Occupational Safety and Health Administration.

Abstracts on Health Effects of Environmental Pollutants, Bioscience Information Service, 2100 Arch Street, Philadelphia, PA 19103.

Annual Report on Carcinogens (latest edition), National Toxicology Program, Mail Drop B 206, P.O. Box 12233, Research Triangle Park, NC 27709.

CHEMDEX, Systems Development Corporation, 2500 Colorado Avenue, Santa Monica, CA 90406.

Chemical Abstracts, American Chemical Society, Chemical Abstracts Service, Customer Service Department, P.O. Box 3012, Columbus, OH 43210.

CHEMLINE, National Library of Medicine, Bethesda, MD 20014.

CHEMNAME, Lockheed Missiles and Space Co., 3251 Hanover Street, Palo Alto, CA 94304.

ENVIRONMENTAL HEALTH NEWS, Occupational Health Services, Inc. 400 Plaza Drive, P.O. Box 1505, Secaucus, NJ 07094 (800-223-8978, in NJ 201-865-7500).

HAZARDLINE, Occupational Health Services, Inc., 400 Plaza Drive, P.O. Box 1505, Secaucus, NJ 07094 (800-223-8978, in NJ 201-865-7500).

Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, IARC, 49 Sheridan Street, Albany, NY.

Registry of Toxic Effects of Chemical Substances, U.S. Department of Health and Human Services, NIOSH Pub. No. 80-102. On sale from the Superintendant of Documents, U.S. Government Printing Office, Washington, DC 20403. (Indicates whether a chemical has been found by NTP or IARC to be a carcinogen or potential carcinogen.)

Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment, American Conference of Governmental Industrial Hygienists, 6500 Glenway Avenue, Bldg. D-5, Cincinnati, OH 45211.

TOXICOLOGY DATA BANK, National Library of Medicine, Bethesda, MD 20014.

TOXLINE, National Library of Medicine, Bethesda, MD 20014.

chemical poses a particular health effect the standard requires that all health effects must be reported if supported by statistically significant evidence based on at least one study conducted in accordance with established scientific principles.

To determine whether a mixture is hazardous, the employer may rely on previous test data provided the mixture already has been tested as a whole. If such data are not available, then the mixture must be considered to have the same health hazards as those components that are in excess of 1% of the total composition (or in excess of 0.1% if the hazards are carcinogenic). If the mixture has not been evaluated for its physical hazard potential, any available information must be used to subjectively assess the potential hazards. In addition, any component must be identified regardless of concentration level, if that component may be released in concentrations exceeding an established Permissible Exposure Limit (PEL) or in quantities hazardous to the health of employees.

A thorough review of the scientific literature, including computer data bases and in-house data, is necessary to make a hazard determination. The standard lists in Appendix C a number of reference sources and bibliographic data bases which may be consulted in making a determination. For example, chemicals are considered hazardous if they are listed by OSHA in 29 CFR Part 1910, Subpart Z, *Toxic and Hazardous Substances*, or by the American Conference of Governmental Industrial Hygienists (ACGIH) in the current list of Threshold Limit Values (TLV). The standard also stipulates that those chemicals that are automatically considered to be carcinogens or potential carcinogens are those which are already so classified by the National Toxicology Program (NTP) in its *Annual Report on Carcinogens*, by the International Agency for Research on Cancer (IARC) in its *Monographs*, or by OSHA in 29 CFR Part 1910, Subpart Z.

Finally, manufacturers, importers, and employers evaluating chemicals must describe, in writing, the procedures they use in a hazard determination. These written procedures must be available to employees and OSHA officials.

WRITTEN HAZARD COMMUNICATION PROGRAM

Employers in SIC Codes 20-39 (manufacturing sector) who use or produce hazardous chemicals must have in their workplaces a written hazard communication program as specified in 29 CFR 1910.1200(e). This program must describe in writing how the standard's criteria in sections (f) **Labels and Other Forms of Warning,** (g) **Material Safety Data Sheets,** and (h) **Employee Information and Training** will be met.

The written hazard communication program must include:

- A description of the steps the employer takes to ensure that labels, MSDSs, and the employee information and training program meet OSHA requirements;
- Procedures used by the employer to evaluate hazards,
- A list of hazardous chemicals known to be present, either compiled for the workplace as a whole or for individual work areas;
- Description of and methods to be used to inform employees of hazards related to unlabeled pipes in the work areas;

- Methods to be used to inform employees of the hazards associated with non routine tasks involving hazardous chemicals, and
- Methods the employer will use to inform contractor employers of the hazardous chemicals their employees may be exposed to while performing their work.

Employers subject to the standard may rely on an existing written hazard communication program if it meets the requirements of the new standard. The written program should not be lengthy or complicated and must be made available, upon request, to employees, their designated representatives, OSHA, and the National Institute of Occupational Safety and Health (NIOSH).

Laboratories in SIC Codes 20-39 must fulfill the following obligations as outlined in 29 CFR 1910.1200(b)(3):

- Ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;
- Retain material safety data sheets received with incoming shipments of hazardous chemicals and ensure that they are readily accessible to laboratory employees; and
- Ensure that laboratory employees are informed of the hazards of the chemicals in their workplaces.

Laboratories not in SIC Codes 20-39, such as academic laboratories, are not required to comply with the requirements of the federal standard (although state laws may specify other requirements for laboratories). The American Chemical Society, however, strongly urges academic laboratories to adhere to the spirit of this program, so that their employees and students may begin to learn how to avoid or limit hazards. Such training will help to prepare students for the policies and practices that they are likely to encounter in the industrial workworld.

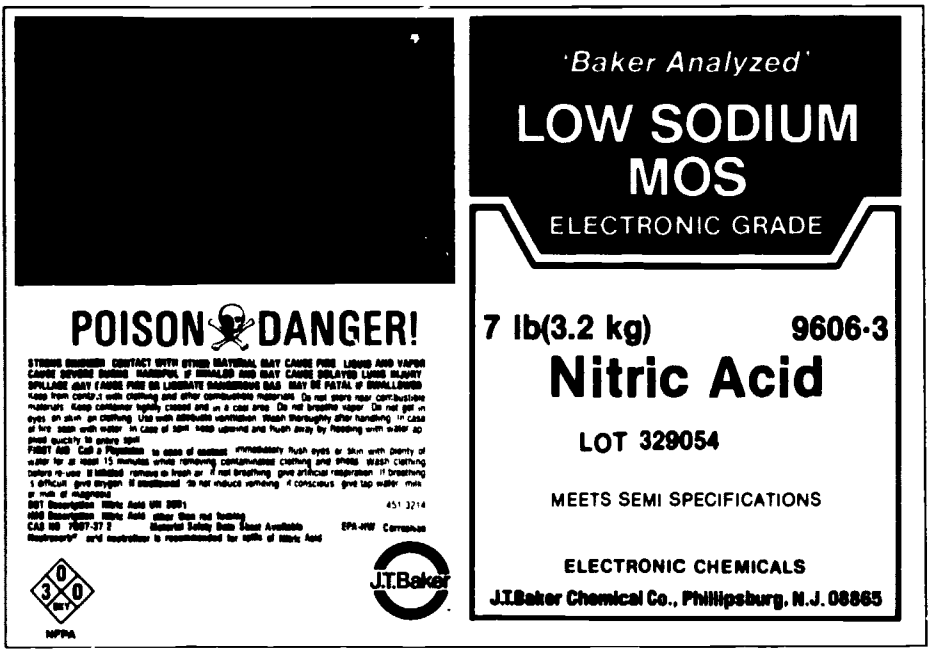
LABELS AND OTHER FORMS OF WARNING

The standard requires every chemical manufacturer or importer to ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked with the identity* of the product, appropriate hazard warnings, and the name and address of the manufacturer, importer, or other responsible party. Similarly, every user of hazardous chemicals within SIC Codes 20-39 must ensure that each container of hazardous chemicals in the workplace is labeled appropriately. The labels must be written in English; additional labels may be supplied in a foreign language as long as the information is presented in English as well. The labeling requirements are outlined in 29 CFR 1910.1200(f).

Labels must be consistent with the requirements of the Hazardous Materials Transportation Act (18 USC 1801 *et seq*) and with the requirements of

* The identity on the label may be any chemical or common name, but it must be keyed to the MSDS, which will contain more extensive information.

A typical label



Courtesy of J T Baker Chemical Co

any of the OSHA substance-specific health standards. The requirements for labeling may be more involved due to the requirements of various state laws. Although the federal standard preempts state laws of non-state-plan states, OSHA's authority to do so is being challenged in the courts. Thus, those preparing labels should be aware of state as well as federal requirements.

OSHA's stated purpose is to have labels serve only as an immediate warning and as a reminder that more detailed information is available elsewhere. Employees should already be aware of the hazards of the chemicals they work with through in-house training programs and material safety data sheets. When a chemical has several potential hazards, not all of the hazards need to be listed as long as the label gives an immediate visual warning of the most imminent hazards. Labels may use symbols, pictures, and/or words to present their message.

Existing labels complying with the standard need not be replaced. Employers, including research laboratories, must not remove or deface labels on incoming containers unless the original labels are replaced with other appropriate ones.

Employers may substitute placards, operating instructions, batch sheets, and the like for stationary process containers (e.g., reactors, filters, stills) in lieu of labels, if the substitute clearly identifies to which container it refers. The substitutes must convey all the information required by the standard and be available to employees in their work areas at all times. Some state laws may require additional labeling of process containers.

MATERIAL SAFETY DATA SHEETS

An MSDS is a technical bulletin detailing information about a hazardous chemical. Every chemical manufacturer or importer must develop or obtain an MSDS for each hazardous chemical it supplies [29 CFR 1910.1200(g)]. An MSDS must accompany each sample or order shipped to a location for the first time after November 25, 1985, and must accompany the first shipment after each update of the MSDS. Distributors must also provide MSDSs to other distributors and manufacturing purchasers of their hazardous chemicals. By May 25, 1986, every employer in SIC Codes 20-39 must have available for their employees an MSDS which meets the criteria of the standard for each hazardous chemical in the workplace. If the employer becomes newly aware of any data or if a report is published suggesting a hazard not indicated on a provided MSDS, the employer is required to prepare a new MSDS within three months as a replacement. Employers also should discuss this additional information with the preparer of the original MSDS.

For chemicals used or produced in the laboratory, the standard only requires that MSDSs for hazardous chemicals received with incoming shipments be maintained and made readily accessible to employees.

The federal standard is designed so that the MSDS is the most comprehensive source of written information for the employee. No standard format for the MSDS is specified as long as all required information is included. The MSDS must be written in English, and at a minimum must contain the following*:

- the identity that is used on the container label;
- the chemical and common name of all ingredients having known health hazards present in concentrations greater than 1%, and for carcinogens, if present at 0.1% or more;
- the physical and chemical characteristics of the hazardous components;
- the physical and health hazards including signs and symptoms of exposure and prior and/or existing contraindicating medical conditions;
- the primary routes of entry;
- any known exposure limits (OSHA PELs or ACGIH TLVs);
- whether the hazardous chemical is listed in the NTP *Annual Report on Carcinogens* or is a potential carcinogen according to IARC or OSHA,
- the precautions for safe handling and use, and procedures for spill/leak cleanup;
- control measures;
- the emergency first aid procedures;
- the date of preparation; and
- the name, address, and telephone number of the company or the responsible employee distributing the MSDS.

When preparing an MSDS, the chemical has to be evaluated based on the mandatory hazards determination requirements. When uncertainty exists concerning a chemical's hazards, the preparer should be conservative in the evaluation to ensure employee protection. Furthermore, the various state right-to-know laws may have other requirements relating to MSDSs that need to be considered.

* See trade secret discussion for exclusions

How To Read an MSDS

When reading an MSDS one should take into consideration the following concerns:

1. The MSDS often outlines only the minimum precautions for safe handling of the chemical in the sections on fire and explosion hazards, spill or leak procedures, special protection information, and special precautions. Thus, if employer policy or the reader's judgment suggests more stringent procedures, they should be used
2. In many cases the emergency first aid procedures and handling precautions are written to deal with a worst case scenario, such as extensive exposure. Knowing this fact, one might conclude, for a seemingly minor incident, that immediate medical attention is not required. The MSDS, however, might call for immediate medical attention. One should keep in mind that in the absence of an informed opinion by the designated health professional, a prudent response is the best policy.
3. When no mention of a particular health effect is made in the MSDS, one should not assume the substance is hazard-free. Test results may not have been available when the MSDS was prepared.
4. One should expect a completed MSDS with no blank spaces. When receiving an MSDS with blank spaces, the supplier should be questioned. If data are not available, the MSDS should state so in the space provided.

EMPLOYEE INFORMATION AND TRAINING

All employers, including R&D laboratory facilities, must institute an information and training program for their employees. The program must

Photograph courtesy of the Chemical Manufacturers Association

begin at the time of an employee's initial assignment, with supplementary sessions whenever a new hazard is introduced into the work area.

This section of the standard [29 CFR 1910 1200(h)] is designed to inform employees about the physical and health hazards of the chemicals in their work areas. Employees must be trained in how to recognize hazardous substances that might be released into the workplace (appearance, odor, origin, etc.) and how to protect themselves from such hazards. Training is the critical link in the hazard communication program, serving to explain and to reinforce the information presented on the labels and MSDSs.

Employers must inform employees of the existence of the standard and the mandatory information and training program. Employees also must be informed of the written hazard communication program, the list of hazardous chemicals, and the MSDSs. Employers must provide their employees with an explanation of the labeling system and how to use the MSDS, as well as how appropriate hazard information can be obtained and used. The standard allows employers the flexibility to choose either to train employees about the hazards of specific chemicals found in the work area or about the categories of hazards found in the work area.

TRADE SECRETS

OSHA has given special consideration to chemical information that the chemical manufacturer or distributor considers to be a trade secret [29 CFR 1910.1200(i)]. Products for which trade secrecy has been claimed must be accompanied by a material safety data sheet. The manufacturer also must specify on the MSDS that the chemical's identity is a trade secret.

In certain circumstances the user may need to know the specific chemical identity of the substance in order to protect the health of its workers. The OSHA procedures for obtaining this information are designed to balance the need-to-know for health protection with the economic value of maintaining the trade secret. If adequate health protection can be achieved only by knowledge of a chemical name, then procedures can be implemented to release the name. In no case can the chemical manufacturer or distributor be forced to disclose a trade secret revealing the chemical process or the percentage composition of the product.

When the specific name of a chemical is desired for protection of worker health in a non-emergency circumstance, such as the desire to monitor the worker or the workplace for specific chemicals, the health officer must request in writing the chemical name and state the specific reasons as to why the information on the material safety data sheet is not sufficient. Proof must be provided that the chemical identity is needed. Finally, a statement guaranteeing confidentiality is necessary but no penalty bond need be posted.

After receipt of this request, the chemical manufacturer has 30 days in which to reply. If the manufacturer still wishes to claim confidentiality it must prove that the chemical identity is indeed an important trade secret. If the parties cannot reach an agreement, OSHA will arbitrate.

In an emergency, the procedures for obtaining the chemical name are different than in a non-emergency. A health officer (e.g., a physician or industrial hygienist) for the employer may contact the chemical manufac-

turer and be told the name of the specific chemical. The chemical manufacturer may not withhold the information requested at the time of the emergency, although the manufacturer may request a follow-up written statement of need and a promise of confidentiality.

STATE AND LOCAL GOVERNMENTS' ROLES

Under the Occupational Safety and Health Act, any state can assert jurisdiction over any occupational safety and health issue for which no federal standard is in effect. A state that chooses to assume responsibility for issues that already are addressed under federal standards must adopt state standards that are at least as stringent as the federal standard. States that are granted this authority by federal OSHA are referred to as "state-plan states." There are currently 23 state-plan states. As these states submit their hazard communication standards to OSHA for approval, they will be responsible for enforcing the Hazard Communication standard which may be implemented through complementary state right-to-know laws.

There are several options state-plan states can take in regard to hazard communication: 1) adopt a standard that is identical to the federal standard; or 2) adopt a standard broader in scope (i.e., covering more entities than SIC Codes 20-39) and/or different in content from the federal standard. In addition, many states and municipalities have adopted or plan to adopt community or public right-to-know laws. These laws are designed to inform the citizenry of the chemical hazards to which they might be exposed should there be a release or leak of a chemical to the environment. (There are over 20 municipalities that have promulgated right-to-know regulations.)

States without a state plan may implement regulations for occupational safety and health issues not covered by any existing OSHA standard. These states may also implement regulations for other entitie not covered by a federal standard (e.g., other SIC Codes, public sector employees). Some states without their own plan, however, have implemented and are enforcing their own hazard communication standards that require compliance from those manufacturers (SIC Codes 20-39) already covered by the federal standard. Although this appears to conflict with federal OSHA's authority to preempt standards applicable to employers in the manufacturing sector, any final decision on this matter ultimately will be made by the courts when, and if, raised by affected parties. (For instance, in New Jersey the U.S. District Court for the District of New Jersey has ruled that the federal Hazard Communication standard preempts those portions of the New Jersey Worker and Community Right-To-Know Act that apply to manufacturers. This decision may be appealed.)

The chart on page 11 shows the status of state hazard communication laws as reported in a telephone survey conducted by the ACS Office of Federal Regulatory Programs in April 1985. Hazard communication laws—both worker and community right-to-know—are at the top of the legislative agendas in many states. Until state actions are completed, the full extent of coverage cannot be determined. Thus, it is most important that users of chemicals contact their state and municipal governments to ensure compliance with any and all applicable statutes.

Information on state hazard communication programs

The following is a listing of information numbers at state agencies responsible for hazard communication. Along with the state contacts is an indicator of whether the state regulations for hazard communication are identical to the federal standard (A), broader in scope and/or different in content (B), or include community right-to-know laws (C). An asterisk (*) indicates that the state legislature is currently considering a worker and/or community right-to-know law. State-plan states are shown in boldface type.

Alaska	907/264-2599	B*	Montana	406/444-3671	A*
Alabama	205/348-7136	A*	Nebraska	402/471-2619	A*
Arizona	608/255-5795	A	**Nevada**	702/885-5240	A
Arkansas	501/375-8442 x310	A	New Hampshire	602/271-2660	B
California	415/540-3037	B	New Jersey	609/984-2202	B&C
Colorado	303/844-5285	A	**New Mexico**	505/827-8905	A
Connecticut†	203/566-4550	B	**New York**†	212/488-7770	B&C
Delaware	800/554-4636	B	**North Carolina**	919/733-4880	A*
Florida	800/367-4378	B	North Dakota	701/255-4011	A*
Georgia	404/881-2281	A	**Ohio**	614/466-5563	A*
Hawaii	808/548-2511	B*	**Oklahoma**	405/231-5351	A
Idaho	208/334-1867	A	**Oregon**	503/378-3278	B
Illinois	217/782-4102	B	Pennsylvania	717/783-2071	B&C
Indiana	317/232-4129	A	Rhode Island	401/277-2756	B&C
Iowa	515/281-3606	B&C	**South Carolina**	803/758-3080	A
Kansas	913/862-9360	A	South Dakota	800/437-1029	A
Kentucky	502/564-6895	A	**Tennessee**	615/741-7184	B&C
Louisiana	504/342-9083	B	**Texas**	512/458-7254	A*
Maine	207/289-2591	B	**Utah**	801/530-6901	A
Maryland	301/659-4100	B	**Vermont**	802/828-2886	B&C
Massachusetts	617/727-5816	B&C	**Virginia**	804/786-6285	B
Michigan	517/373-1410	A	**Washington**	206/753-6497	B
Minnesota	612/297-3254	B*	West Virginia	304/348-7890	B*
Mississippi	601/982-6315	A	Wisconsin	608/266-7731	B
Missouri	314/751-3403	A*	**Wyoming**	307/777-6813	A

†Plan covers only state and local government employees

GLOSSARY

The following terms are defined here to provide a clearer understanding of the hazard communication standard. For a complete list of terms pertinent to the standard, refer to the *Federal Register* notice of November 25, 1983, pp. 53340-53342 [29 CFR 1910.1200(c)].

ACGIH—American Conference of Governmental Industrial Hygienists.

CFR—Code of Federal Regulations.

Chemical name—The scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service

(CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation

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

Container—Any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems are not considered to be containers.

Employee—A worker employed by an employer in a workplace in SIC Codes 20 through 39 who may be exposed to hazardous chemicals under normal operating conditions or foreseeable emergencies, including, but not limited to production workers, line supervisors, and repair or maintenance personnel. Office workers, grounds maintenance personnel, security personnel or non-resident management are generally not included, unless their job performance routinely involves potential exposure to hazardous chemicals.

Hazard warning—Any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the hazards of the chemical(s) in the container(s).

Hazardous chemical—Any chemical which is a physical hazard or a health hazard.

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

IARC—International Agency for Research on Cancer.

Identity—Any chemical or common name which is indicated on the MSDS for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label, and the MSDS.

LD_{50}—Lethal dose needed to kill 50% of the test population

MSDS—Material Safety Data Sheet.

NIOSH—National Institute for Occupational Safety and Health

NTP—National Toxicology Program.

PEL—Permissible Exposure Limit.

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

RCRA—Resource Conservation & Recovery Act.

SIC—Standard Industrial Classification.

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

TLV—Threshold Limit Value.

Trade secret—Any confidential formula, pattern, process, device, information or compilation of information (including chemical name or other unique chemical identifier) that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it.

USC—United States Code.

SUGGESTED READING

Hazardous Materials Identification System Revised Implementation Manual, National Paint and Coatings Association, Washington, DC, 1985

Lowry, George G. and Lowry, Robert C., *Hazard Communication and OSHA Requirements*, Lewis Publishers, Inc., Chelsea, MI, 1985.

O'Connor, Charles J and Lirtzman, Sidney P. (eds.), *The Handbook of Chemical Industry Labeling*, Noyes Publications, Park Ridge, NJ, 1985.

O'Connor, Charles J. and Young, Jay A., *How To Plan an Effective Employee Hazard Communication Program and Safety Data Sheet and Label Program for "Right-To-Know" Regulations*, Labelmaster, Chicago, IL, 1984.

Willard, Paul W., *A Guide To Federal and State Right-To-Know*, Thompson Publishing Group, Washington, DC, 1984.

ACKNOWLEDGMENTS

This brochure was developed and written by the ACS Task Force on Occupational Health and Safety. The activities of the Task Force fall under the purview of the Subcommittee on Regulatory Practices of the ACS Committee on Chemistry and Public Affairs.

Several ACS members have contributed to the brochure's organization and we are grateful for the time and effort they took to ensure its completeness and accuracy. The pamphlet was written by Barry Bochner (Atlantic Chemical Co.), John P. McCullough (Mobil Research and Development Corp.), Vera Kolb Meyers (Southern Illinois University), and Ralph G Smith (University of Michigan, retired). Review and helpful commentary were received from Sunney I. Chan (California Institute of Technology), Alan J. Hart (Union Carbide), George G. Lowry (Western Michigan University), George Roush, Jr. (Monsanto Co.), Susann J. Steinberg (San Jose Medical Group, Inc.), and Jay A. Young (chemical consultant). The pamphlet has benefited from the editorial review and production assistance provided by the staff of the Office of Federal Regulatory Programs, ACS Department of Government Relations and Science Policy.

William Beranek, Jr.
Chairman
Task Force on
Occupational Health & Safety
(Indianapolis Center for
Advanced Research, Inc.)

Inara M Brubaker
Chairman
Subcommittee on
Hazard Communication Brochure
(Signal Research Center)

APRIL 1985