Guide to Precautionary Labeling of Hazardous Chemicals



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GUIDE
TO
PRECAUTIONARY LABELING
OF
HAZARDOUS CHEMICALS



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The information and recommendations contained in this guide were prepared for the guidance of those who in their occupation use, handle, or store hazardous industrial chemicals. The information was compiled from experience and data provided by the personnel of various manufacturers of chemicals and from information appearing in professionally recognised technical and scientific publications. While the Manufacturing Chemists Association believes these sources are reliable and represent the best opinions available on the subject as of 1970, the Association makes no warranty, guaranty or representation as to the correctness or sufficiency of any information or recommendation herein, and the Association assumes no responsibility in connection therewith; nor can it be assumed that all necessary warnings and precautionary measures are contained in this guide, or that other or additional information or measures may not be required or desirable because of particular or exceptional conditions or circumstances, or because of applicable federal, state, or local law.

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PREFACE TO SEVENTH EDITION

It is the policy of the MCA Labels and Precautionary Information Committee to review and make necessary revisions to Manual L-1 to reflect the best current thinking in the field of precautionary labeling. It is only in this way that the manual can be made to serve effectively the needs of those who use it. A review and general description of revisions to the Sixth Edition follows.

Major changes are addition of fire-extinguishing statements for ignitable products, addition of instructions for cleaning up spills or leaks, replacement of many specific chemical label texts with label texts based upon specific hazards or combinations of hazards, the omission of Part III, Illustrative Labels for Pesticides, and revision of Table I.

In this edition Table I provides a more specific guide to the selection of label language. The revised table lists the most common hazardous properties of chemicals and suggests the Signal Word, Statements of Hazard, Precautionary Measures, and Instructions in Case of Contact or Exposure. The new form of Table I promotes the uniformity in label language expressed in the General Principles.

The illustrations of precautionary texts are expressed not in terms of specific *chemicals*, but in terms of specific *hazards* or combinations of hazards. This approach emphasizes the fact that a precautionary label should be based upon hazards that the product is known to possess as expressed in the General Principles.

Part III, Illustrative Labels for Pesticides, has been omitted because the requirements for precautionary labeling of pesticides are clearly defined by Interpretation 18 of the regulations for the enforcement of the Federal Insecticide, Fungicide, and Rodenticide Act, and the Pesticides Regulation Division of the U.S. Department of Agriculture requires rigid adherence to these texts.

Instructions are presented that may be used in the precautionary texts as steps to be taken in case of fire, spill, or leak.

Additional changes include the following:

1. Definitions for the following terms have been added: antidote, first aid, flammable solid, flammable gas, median lethal dose or concentration, pressure-generating substance, and pyroforic substance. The term "oxidising material" has been changed to "strong oxidizer," and the term "sensitizer" has been changed to "strong sensitizer."

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2. The definition of a "poison" has been modified slightly to incorporate the concept of the median lethal dose or median lethal concentration (LD_{50} or LC_{50}). The term "highly toxic substance" has been introduced as the equivalent of the term "poison," and the definition is indexed under the former term.

3. The definition of a "toxic substance" has been replaced by one based on ranges of LD_{50}'s and LC_{50}'s. In this respect the definition is expressed in terms similar to those used for a "highly toxic substance."

4. First-aid statements are provided in Table I as an integral part of the label text for those chemicals that are highly toxic, toxic, corrosive, or which are irritants or strong sensitizers to skin.

5. Lists of label statements not appearing in Table I are provided for certain hazards that are less common than those which are dealt with in Table I.

6. Examples of antidote statements are given.

7. Examples of "notes to physicians" are given.

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A REVIEW OF PRECAUTIONARY LABELING ACTIVITY

Accidental experience and willful experiment led man early to recognize the hazards which typify some substances. In 1450, Scotland enacted one of the first statutes governing product hazard. The Court Apothecary then ruled "that all persons are forbidden under the pain of treason to bring home poisons for any use by which Christian man or woman can take harm." From such beginnings came today's laws and regulations covering the identification of hazardous substances.

One of the earliest United States statutes in the chemical field was the Federal Caustic Poison Act (1927). It covered eleven caustic or corrosive substances in certain concentrations, in containers "suitable for household use." Administration was by the Food and Drug Administration. In its simplest terms, packages of the specified materials were required by law to carry labels containing the word "POISON" in particular type size along with an "antidote" statement. The Federal Hazardous Substances Act as amended (1966) repealed the Federal Caustic Poison Act except with respect to these substances as they might be used in food, drug, or cosmetic applications.

The year 1932 saw the introduction into Congress of a Volatile Poisons Bill. A first draft contained a general definition of hazardous materials. A subsequent one followed the earlier plan of listing specific chemicals. The second draft authorized the Surgeon General to enlarge the list after investigation. While these bills did not become law, they marked a sharp acceleration in the evolution of precautionary labeling with its recognition by statutory requirement in the United States. With this came renewed awareness of responsibility by producers and by industry groups such as the Manufacturing Chemists Association (MCA).

From such group activity came the Chemical Products Agreement Committee appointed by the Surgeon General. The work of this group evolved the voluntary "Surgeon General's Agreements" entered into by the U.S. chemical industry in 1934-35. The texts of the precautionary labels to be used on specific products were agreed upon and made a part of executed agreements. These continued in effect and were honored by industry until 1952. The Surgeon General then agreed to their replacement by broader and more widely applicable practices formulated through the continued work of MCA and its Labels and Precautionary Information (LAPI) Committee.

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MCA had early recognized the place of precautionary labeling in relations both with its customers and with state and federal governments. There were numerous strong reasons for taking the initiative in this phase of chemical marketing. The industry had an outstanding safety record in its manufacturing units. MCA members believed this safety record could be projected to the plants and homes of their customers to their mutual benefit. There was always the shadow of litigation that faces any producer as the result of real or alleged injury by a product. Chemical manufacturers had already seen the possible alternative of federal and state legislation which might or might not be wisely framed. MCA chose the path of self-regulation. In 1944 it convened a conference on a chemical precautionary labeling code. Attended by over 90 member representatives, it resulted in the formation of the Labels and Precautionary Information Committee of the Association. This committee continues as the group longest active in this endeavor. One of its earliest concerns was the compilation of a manual on precautionary labeling practices for chemicals. First issued in March 1945 and revised on six subsequent occasions, Manual L-1 of the MCA LAPI Committee has become a widely recognized text on this subject.

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INTRODUCTION TO PRECAUTIONARY LABELING OF HAZARDOUS CHEMICALS

Many products present no hazard in normal handling and storage. For these products, no precautionary statements are necessary on the label. The development of new chemical products, and the introduction of chemical processes into ever-widening fields, have accentuated the need for furnishing appropriate information in those cases where there are hazards requiring special precautions. Precautionary information should, as far as is practicable, reach every person using, handling, or storing hazardous substances.

The most practical means of disseminating this information has been found to be by precautionary labels, affixed to containers of hazardous substances, bearing appropriate precautionary statements expressed as simply and briefly as possible. Such label information, however, cannot take the place of the education of personnel regarding product hazards and the use of safety clothing and equipment. This education is, and must remain, the direct responsibility of their employers. The wording on precautionary labels cannot be expected to cover the complete information as to the properties of a material nor the complete details of its proper handling under all conditions. Such information may be found in the producers' technical bulletins, in the Manufacturing Chemists Association's Chemical Safety Data Sheets, or in other literature.

To achieve uniform and adequate labeling of hazardous substances, the Labels and Precautionary Information (LAPI) Committee of the Manufacturing Chemists Association offers Manual L-1 as a guide in preparing precautionary label texts.

The labeling of radioactive materials and explosives is a complex problem outside the scope of this Guide.

This Guide will be found extremely useful in the preparation of a precautionary text for any hazardous chemical even though the General Principles were designed originally for hazardous chemicals intended for industrial use. The precautionary texts developed with the aid of this Guide should be used in addition to, or in combination with, any specific wording required by law. Since individual statutes, regulations, or ordinances may require that particular information be included in a label, that certain information be displayed in a particular manner, or that a specific label be affixed to

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a container, the use of this Guide will not necessarily insure compliance with such laws. The specific requirements of each such law, and the regulations issued thereunder, must be observed in order to insure compliance. Such laws include the Federal Food, Drug, and Cosmetic Act and the Federal Hazardous Substances Act and similar state and municipal legislation; the Federal Insecticide, Fungicide, and Rodenticide Act and similar state legislation; the U.S. Department of Transportation Hazardous Materials Regulations; and others.

DEFINITION OF TERMS
USED IN PRECAUTIONARY LABELING

Antidote—*Specific therapeutic measures* that may or may not require the services of a physician.

Combustible Liquid—A liquid that has a flash point above 80°F and ~~to and including 200°F~~ as determined by Tagliabue's Open-Cup Method.

Corrosive—A substance which in contact with living tissue causes destruction of the tissue by chemical action. This term shall not refer to action on inanimate surfaces.

Dust—Solid particles generated by handling, crushing, grinding, rapid impact, detonation, or decrepitation of organic or inorganic materials such as rock, ore, metal, coal, wood, grain, etc. Dusts can be dispersed in air but settle under the influence of gravity.

Extremely Flammable Liquid—A liquid that has a flash point at or below 20°F ~~or less~~ as determined by Tagliabue's Open-Cup Method.

First Aid—*General measures* that can be taken by the victim or other persons aimed principally at terminating the exposure.

Flammable Substance—A substance falling within any of the following categories:

1. A *Flammable Liquid* is one that has a flash point ~~above 80°F~~ below 100°F to and including 80°F as determined by Tagliabue's Open-Cup Method.

2. A *Flammable Solid* is one, other than an explosive, that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard.

3. A *Flammable Gas* is a gas with either of the following properties: (a) at atmospheric temperature and pressure forms a flammable mixture with air when present at a concentration of 13 percent or less (by volume) or which forms a range of flammable mixtures with air wider than 12 percent regardless of the lower limit, or (b) projects a flame more than 18 inches beyond the ignition source with valve opened fully, or the flame flashes back and burns at the valve with any degree of valve opening, when tested in the Bureau of Explosives' Flame Projection Apparatus.

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Fume—Solid particles generated by condensation from the gaseous state, generally after volatilization from molten metals, etc., and often accompanied by a chemical reaction such as oxidation. Fumes flocculate and sometimes coalesce.

Gas—A normally formless fluid that occupies the space of enclosure and which can be changed to the liquid or solid state by the effect of increased pressure or decreased temperature or both. A gas diffuses.

Hazardous Substance—A substance or mixture of substances that is toxic, highly toxic, an irritant, a corrosive, a strong oxidizer, a strong sensitizer, a combustible liquid, flammable, an extremely flammable liquid, dangerously reactive, or pressure-generating, ***provided*** such substance or mixture of substances may cause substantial personal injury or substantial illness during or as a direct result of any customary or reasonably foreseeable handling or use.

Highly Toxic Substance (Poison)—A substance falling within any of the following categories:

1. A substance that has a median lethal dose (LD_{50}) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 grams and 300 grams each.

2. A substance that has a median lethal dose (LD_{50}) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours or less with the bare skin of albino rabbits weighing between 2 kilograms and 3 kilograms each.

3. A substance that has a median lethal concentration (LC_{50}) in air of 200 parts per million by volume or less of gas or vapor or 2 milligrams per liter or less of mist, fume, or dust when administered by continuous inhalation for one hour or less to albino rats weighing between 200 grams and 300 grams each, ***provided*** such concentration is likely to be encountered by man when the substance is used in any reasonably foreseeable manner.

If available data on human experience with any substance in the above-named concentrations indicate results different from those obtained on animals, the human data shall take precedence in any classification of a substance as highly toxic.

Irritant—A substance, not a corrosive, which on immediate, prolonged, or repeated contact with normal living tissue will induce a local inflammatory reaction.

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Median Lethal Dose or Concentration—The dose (LD_{50}) or concentration for a given period of time (LC_{50}) of a substance that is most likely to kill one-half of a group of animals within 14 days.

Mist—Suspended liquid droplets generated by condensation from the gaseous to the liquid state or by breaking up a liquid into a dispersed state such as by splashing, foaming, or atomizing.

Mixture—A physical commingling of two or more substances not involving a chemical reaction.

Poison—See **Highly Toxic Substance.**

Pressure-Generating Substance—A substance falling within any of the following categories:

1. A substance that must be protected from spontaneous polymerization by the addition of an inhibitor, or by refrigeration or other thermal control.

2. A substance that may decompose to release gas in its container.

3. A substance that comprises the contents of a self-pressurised container.

Pyroforic Substance—A substance that becomes self-igniting when exposed to normal atmospheric conditions.

Strong Oxidizer—A substance that yields oxygen readily to stimulate the combustion of organic matter.

Strong Sensitizer—A substance that available data on human experience show to be capable of inducing an allergic reaction in a substantial number of persons who come into contact with it.

Toxic Substance—A substance falling within any of the following categories:

1. A substance that has a median lethal dose (LD_{50}) of more than 50 milligrams per kilogram but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 grams and 300 grams each.

2. A substance that has a median lethal dose (LD_{50}) of more than 200 milligrams per kilogram but not more than 1000 milligrams

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per kilogram of body weight when administered by continuous contact for 24 hours or less with the bare skin of albino rabbits weighing between 2 kilograms and 3 kilograms each.

3. A substance that has a median lethal concentration (LC_{50}) in air of more than 200 parts per million but not more than 2000 parts per million by volume of gas or vapor or more than 2 milligrams per liter but not more than 20 milligrams per liter of mist, fume, or dust when administered by continuous inhalation for one hour or less to albino rats weighing between 200 grams and 300 grams each, ***provided*** such concentration is likely to be encountered by man when the substance is used in any reasonably foreseeable manner.

If available data on human experience with any substance in the above-named concentrations indicate results different from those obtained on animals, the human data shall take precedence in any classification of a substance as toxic.

Vapor—The gaseous form of a substance that is normally in the solid or liquid state. A vapor diffuses.

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GENERAL PRINCIPLES OF PRECAUTIONARY LABELING

The following General Principles serve as a guide in the preparation of precautionary labels for hazardous substances.

1. Each hazardous substance presents a distinct problem and must be treated individually in the light of its own characteristics. Conclusions regarding the hazards of a product cannot safely be drawn either from the properties of the materials from which it is formed or by analogies based upon chemical structure. Mixtures of two or more chemicals may have properties that vary in kind or degree from those of the individual components. Any precautionary label for mixtures should be based on the properties of the finished product. Impurities may contribute hazardous properties and should not be overlooked.

2. All statements on precautionary labels should be brief, accurate, and expressed in simple, easily understood terms.

3. Precautionary labeling should be used only when and to the extent necessary. The language should be practical, not based alone upon the inherent properties of a product, but directed toward the avoidance of hazards resulting from such use, handling, and storage as may be reasonably foreseeable. The use of precautionary labels for relatively harmless products, or the use of unnecessary words, may develop a disregard for precautionary texts and defeat their purpose as surely as will failure to give adequate notice of hazards.

4. On labels for different products, uniformity in language to indicate the same hazards and same degree of hazard is most desirable in order to gain greater understanding through standardization.

5. The following subject matter should be considered for inclusion on a precautionary label: *Name of Product; Signal Word* designating degree of hazard—DANGER!, WARNING!, or CAUTION!; *Affirmative Statement of Hazards; Precautionary Measures* covering actions to be followed or avoided; *Instructions in Case of Contact or Exposure*, where advisable; *Antidotes and Notes to Physicians*, where advisable; *Instructions in Case of Fire, Spill, or Leak*, where advisable; and *Instructions for Container Handling and Storage*, where advisable.

6. Inclusion of the word POISON and the skull and crossbones on a label should be limited to those cases where the product is highly toxic according to the definition appearing on page 12, or where

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such use is prescribed by law. When used, this legend should not take the place of the Signal Word.

7. A non-descriptive code designation or trade name should not be used as the only identification of a hazardous substance. If the complete chemical name is not shown, the label should clearly state the type of chemical, e.g., "corrosive acid," "lead compound."

8. Precautionary statements should be grouped together in a prominent location on the label and should be printed in easily legible type which is in contrast by typography, layout, or color with other printed matter on the label. The label should be affixed firmly to and in a conspicuous place on the container.

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GENERAL INSTRUCTIONS FOR PREPARATION OF PRECAUTIONARY LABELS

In the preparation of a precautionary label, the compilation of all available relevant information on the product is a necessary first step. An adequate knowledge of the toxicity of the material (obtained from the literature or through laborstory tests) and data on physical and chemical properties, packaging, and methods of handling and use of the product are needed to make possible a description of the hazards. In the case of an established product, advantage should be taken of the experience of people involved in manufacturing, shipping, and using the material. All the General Principles should be kept in mind and the following information considered for inclusion on the label:

Name of Product—This is important information for the safety of handlers and users. It is preferable that the chemical name of the product be used. If the product is a mixture, those components which contribute substantially to the hazard should be identified. A non-descriptive code designation or trade name should not be used as the only identification of a hazardous chemical. If the complete chemical name is not shown, the label should at least clearly state the type of chemical, e.g., "corrosive acid," "lead compound." In any case, identification should be adequate to permit selection of proper treatment in case of exposure.

Signal Word—This word is intended to draw attention to the presence of hazard, and to indicate the degree of severity. In the order of diminishing severity of hazard, the Signal Words recommended are DANGER!, WARNING!, and CAUTION!

Degree of severity can be expressed only in relative terms. DANGER! is the strongest of the three words and should be used for those products presenting the most serious hazards. CAUTION! is recommended for those compounds presenting the least serious hazards. WARNING! is intermediate between the two.

Statement of Hazards—This statement should give notice of the hazards that are present in connection with the customary or reasonably foreseeable handling or use of the product. Examples are EXTREMELY FLAMMABLE and HARMFUL IF ABSORBED THROUGH SKIN.

Many chemical products will present more than one type of

hazard, in which case appropriate statements for each significant type should be included on the label. In general, the most serious hazard should be stated first.

While any compound may be hazardous if improperly used, it is impractical to cover every possible contingency on a label. Efforts should be directed toward giving notice of the significant hazards. A minor hazard may frequently be covered clearly and briefly by an appropriate precautionary statement alone. In some cases, the total hazard of a product, while justifying one or more Precautionary Measures, may be of such order as to require no Statement of Hazard on the label.

Precautionary Measures—These instructions are intended to supplement the Statement of Hazards by setting forth briefly measures to be taken to avoid injury or damage from stated hazards. Examples are "Keep away from heat, sparks, and open flame." and "Avoid breathing dust."

Precautionary Measures may be included for hazards not considered of sufficient importance to require mention in the Statement of Hazards.

Statements similar to "Do not take internally." are seldom necessary where the Precautionary Measure to be followed is obvious as, for example, when the product is labeled POISON or the Statement of Hazards contains the words MAY BE FATAL IF SWALLOWED. On the other hand, the instruction may be desirable if the name, appearance, use, or other attributes of the chemical are likely to result in its being taken orally through accident or mistaken identity.

Instructions in Case of Contact or Exposure—The primary purpose of precautionary labeling is to prevent injury or damage. However, Instructions in Case of Contact or Exposure may be included in those instances where the results of contact or exposure are severe and immediate treatment is highly desirable, and where simple remedial measures may be taken safely before medical assistance is available.

First aid instructions should be limited to recognized procedures based on simple methods and commonly available materials. Instructions for strictly medical treatment should be included when specifically required by law or indicated by special circumstances (see **Antidotes and Notes to Physicians** below). Some laws and regulations require the use of special or strictly defined antidotes on labels, or prescribe

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specific ways in which these must be shown for certain hazardous substances.

Because of the serious and lasting effects that may result from eye injuries, a recommendation to get medical attention should accompany any specific instructions directed to treatment of the eyes.

In certain instances, simple remedial measures such as washing, or removal of clothing, may be included where they will serve to avoid serious injury following contact or exposure.

Antidotes and Notes to Physicians—Specific therapeutic measures that can be taken before the physician arrives may be presented on a label under the heading "Antidote." Examples appear on page 62. Measures that can be taken only by a physician may be presented on a label under the heading "Note(s) to Physicians." Obviously, such information must be written by a physician for physicians. Examples appear on page 63.

Instructions in Case of Fire, Spill, or Leak—Accident instructions should be as simple and brief as possible and advise the use of suitable materials for control. Labels should provide persons who handle containers during shipment and storage with appropriate instructions for confining and extinguishing fires and for cleaning up spills or leaks. This information on precautionary labels, affixed to containers, will insure reference and provide opportunity to plan for emergencies that might occur during storage and use of the product. Applicable phrases may be selected from the statements on page 65.

Instructions for Container Handling and Storage—Care should always be exercised in handling and storing containers of hazardous chemicals, and in removing the contents. However, in some cases the properties of the product or the characteristics of the container may be such that specific instructions, such as those presented on page 67, may be included on the label.

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SELECTION OF PRECAUTIONARY STATEMENTS

The effectiveness of precautionary labeling depends in large measure upon the extent to which there is uniformity of language, on labels of chemicals generally, to denote the same hazards and the same severity of hazard. Substantial differences in language for hazards that are similar in kind and degree can only create confusion. On the other hand, uniformity of language can lead to a better understanding of precautionary labeling by those to whom it is directed and by the public at large.

Complete uniformity of language is not feasible since the universe of chemicals includes too varied a range of hazardous properties and total uniformity could be achieved only by writing a specific label for every chemical and mixture of chemicals. On the other hand, the total hazards of the great majority of chemicals can be divided into a relatively few classes, such as set forth in Table I, and it is in describing these hazards that significant progress toward standardization of language can be made.

Table I represents a standardization of language, and is presented as a guide in the selection of precautionary statements for labels. It is a classification of chemicals on the basis of the hazardous properties that are most frequently encountered. Opposite each class of hazard are given a Signal Word, Statements of Hazard, Precautionary Measures, and, in most cases, Instructions in Case of Contact or Exposure and additional markings. All of these statements are considered to be the most appropriate for each of the particular classes of hazard, and are believed to be as concise and few in number as is consistent with a complete presentation of precautionary information.

It is important to bear in mind that hazardous chemicals frequently have properties that place them in more than one hazard class. In such cases, the precautionary label text will be the sum of the language in the individual classes. When the texts for different classes of hazard are combined, it may be necessary to eliminate some redundancies that occur in the Precautionary Measures or First Aid statements.

It must be emphasized that there are many hazardous properties of chemicals other than those dealt with in Table I and, therefore, there will be instances in which the label texts given in Table I will be inapplicable or insufficient. In such cases, suitable statements should be developed to fit the situation. In an effort to bring about uniformity of language, one should not lose sight of the fact that each hazardous

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substance must be considered individually in the light of its own characteristics and customary or reasonably foreseeable handling or use.

Examples of additional label statements that may be applicable in particular instances are given in the Label Statements Not Appearing in Table I section.

Some Statements of Hazard and Precautionary Measures in Table I contain words in parentheses. These words represent choices that are to be made according to the facts in a particular situation. It is not intended that the final wording should contain any parenthetical expressions.

It must also be recognized that the precautionary labeling detailed in Table I is directed primarily to the avoidance of injury from single, accidental exposures to a chemical. Some chemicals, however, produce cumulative effects from repeated exposures. When a knowledge of cumulative effects exists, a statement of that hazard together with suitable instructions for the avoidance of such injury should be included with the other label information recommended in Table I.

TABLE I—SELECTION OF PRECAUTIONARY STATEMENTS

	CLASS OF HAZARD	SIGNAL WORD	STATEMENTS OF HAZARD
INGESTION	Highly Toxic < 50 mg/kg	DANGER!	MAY BE FATAL IF SWALLOWED
	Toxic 50 to 500 mg/kg	WARNING!	HARMFUL IF SWALLOWED
ABSORPTION	Highly Toxic up to 200 mg/kg	DANGER!	MAY BE FATAL IF ABSORBED THROUGH SKIN
	Toxic 200 to 1000 mg/kg	WARNING!	HARMFUL IF ABSORBED THROUGH SKIN
INHALATION	Highly Toxic up to 200 ppm to 2 mg/liter	DANGER!	MAY BE FATAL IF INHALED
	Toxic LC_{50} 200 to 2000 ppm 2 to 20 mg/liter	WARNING!	HARMFUL IF INHALED
	Strong Sensitizer, Lungs	WARNING!	MAY CAUSE ALLERGIC RESPIRATORY REACTION
	Physiologically Inert Vapor or Gas	CAUTION!	(VAPOR) (GAS) REDUCES OXYGEN AVAILABLE FOR BREATHING

NOTE 1. In addition to the use of POISON and skull and crossbones in the highly toxic classes shown above, certain laws may require this use in other specified instances.

NOTE 2. Examples of Antidote Statements; Examples of Notes to Physicians; Instructions in Case of Fire, Spill, or Leak; and Instructions for Container Handling and Storage are illustrated separately starting on Pages 62, 63, 65, and 67.

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PRECAUTIONARY MEASURES	INSTRUCTIONS IN CASE OF CONTACT OR EXPOSURE
Wash thoroughly after handling. See back cover for message	POISON Call a Physician FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.
Wash thoroughly after handling. See back cover for message	FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.
Do not get in eyes, on skin, on clothing. Wash thoroughly after handling.	POISON Call a Physician FIRST AID: In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)
Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.	FIRST AID: In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before re-use. (Discard contaminated shoes.)
Do not breathe (dust, vapor, mist, gas). Keep container closed. Use only with adequate ventilation.	POISON Call a Physician FIRST AID: If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.
Avoid breathing (dust, vapor, mist, gas). Keep container closed. Use with adequate ventilation.	FIRST AID: If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.
Avoid breathing (dust, vapor, mist, gas). Keep container closed. Use with adequate ventilation.	
Keep container closed. Use with adequate ventilation. Do not enter storage areas unless adequately ventilated.	

NOTE 3. Products may present a special or unique hazard not covered in this table. For example, some chemicals may react violently with water, may liberate extremely poisonous vapors under special conditions, etc. These special conditions must be covered in the precautionary label text. See Page 50 for examples.

NOTE 4. The First Aid instructions for Class of Hazard INGESTION are considered to be applicable in the vast majority of cases involving the ingestion of a poison. In all cases, a study of the particular product involved and the applicable laws may dictate either additional or completely different First Aid instructions.

(Continued)

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TABLE I—SELECTION OF PRECAUTIONARY STATEMENTS

	CLASS OF HAZARD	SIGNAL WORD	STATEMENTS OF HAZARD
CONTACT	Corrosive, Eye Irreversible damage 24 hr. –	DANGER!	CAUSES (SEVERE) EYE BURNS (Or irritation continuing thru 168 hrs.)
CONTACT	Corrosive, Eye and Skin Irreversible damage 24 hr. DOT 4 hr. irreversible skin damage	DANGER!	CAUSES (SEVERE) BURNS
CONTACT	Irritant, Eye FHSA 50/110 or more –	WARNING!	CAUSES EYE IRRITATION (or opacity continuing thru 168 hrs.)
CONTACT	Irritant, Eye and Skin FHSA 4.5/8 or higher	WARNING!	CAUSES IRRITATION
CONTACT	Strong Sensitizer, Skin	WARNING!	MAY CAUSE ALLERGIC SKIN REACTION
FLAMMABILITY	Extremely Flammable Liquid <20°F closed cup (-6.7°C)	DANGER!	EXTREMELY FLAMMABLE
FLAMMABILITY	Flammable Liquid 20°F to 100°F closed cup 37.8°C)	WARNING!	FLAMMABLE
FLAMMABILITY	Flammable Solid	WARNING!	FLAMMABLE
FLAMMABILITY	Flammable Gas	DANGER!	EXTREMELY FLAMMABLE (GAS) (LIQUID AND GAS) UNDER PRESSURE
FLAMMABILITY	Combustible Liquid cc 100°F to 200°F	CAUTION!	COMBUSTIBLE
FLAMMABILITY	Pyroforic Substance	DANGER!	EXTREMELY FLAMMABLE CATCHES FIRE IF EXPOSED TO AIR
FLAMMABILITY	Strong Oxidizer	DANGER!	STRONG OXIDIZER CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE

NOTE 1. In addition to the use of POISON and skull and crossbones in the highly toxic classes shown above, certain laws may require this use in other specified instances.

NOTE 2. Examples of Antidote Statements; Examples of Notes to Physicians; Instructions in Case of Fire, Spill, or Leak; and Instructions for Container Handling and Storage are illustrated separately starting on Pages 62, 63, 65, and 67.

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(Continued)

PRECAUTIONARY MEASURES	INSTRUCTIONS IN CASE OF CONTACT OR EXPOSURE
Do not get in eyes. Avoid breathing (dust, vapor, mist, gas). Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.	FIRST AID: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
Do not get in eyes, on skin, on clothing. Avoid breathing (dust, vapor, mist, gas). Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.	FIRST AID: In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before re-use. (Discard contaminated shoes.)
Avoid contact with eyes. Wash thoroughly after handling.	FIRST AID: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.	FIRST AID: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician. Flush skin with water. (Wash clothing before re-use.)
Avoid prolonged or repeated contact with skin. Wash thoroughly after handling.	FIRST AID: In case of contact, immediately wash skin with soap and plenty of water.
Keep away from heat, sparks, and [redacted] flame. Keep container closed. Use with adequate ventilation.	(See page 65 for selection of appropriate fire-extinguishing statement.)
Keep away from heat, sparks, and [redacted] flame. Keep container closed. Use with adequate ventilation.	
Keep away from heat, sparks, and [redacted] flame.	
Keep away from heat, sparks, and [redacted] flame. Use with adequate ventilation. Never drop cylinder. Keep cylinder out of sun and away from heat.	
Keep away from heat and [redacted] flame.	
Keep away from heat, sparks, and [redacted] flame. Keep container closed.	
Keep from contact with clothing and other combustible materials. Do not store near combustible materials. Store in tightly closed container.	Remove and wash contaminated clothing promptly.

NOTE 3. Products may present a special or unique hazard not covered in this table. For example, some chemicals may react violently with water, may liberate extremely poisonous vapors under special conditions, etc. These special conditions must be covered in the precautionary label text. See Page 50 for examples.

NOTE 4. The First Aid instructions for Class of Hazard INGESTION are considered to be applicable in the vast majority of cases involving the ingestion of a poison. In all cases, a study of the particular product involved and the applicable laws may dictate either additional or completely different First Aid instructions.

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LABELS FOR CHEMICALS WITH SINGLE OR MULTIPLE HAZARDS

This section is only a different form of Table I, but is included to illustrate the arrangement of the various elements of a precautionary label text. It sets forth the recommended labels for those chemicals that are determined to have only that specific hazard or hazards listed above each text. **Be certain to refer also to all footnotes to Table I to determine the need for additional label statements.**

An explanation of the application of the statement "Discard contaminated shoes." and of the use of the words in parentheses in these labels is as follows:

Shoes that are contaminated with a chemical can, in most cases, be decontaminated through suitable washing, airing or other means. Thus, they are rendered fit for reuse, and there is no need to include the instruction "Discard contaminated shoes." in the first-aid statement. However, there are certain chemicals such as acrylonitrile, ethylene oxide, and methyl bromide that are retained so tenaciously by leather that there is no satisfactory method of removing them within a reasonable period of time. These are also chemicals which produce very serious blisters and other damage when they are retained in contact with the skin. Additionally, there are other chemicals, such as aniline, which have extreme toxicity by skin absorption as well as an affinity for leather. In all of these cases, the consequences of error are so severe that it does not seem wise that an individual should take the risk of reusing shoes that have had such chemicals absorbed into them, even though some decontamination procedure has been attempted. In writing precautionary labels, one must make a judgment in this situation based on the physical and toxicological properties of the product in question. If the facts warrant, the parentheses should be removed from about the statement "Discard contaminated shoes." and the statement should be allowed to remain in the first-aid instructions.

In Precautionary Measures that warn against breathing of the chemical, the physical forms "dust, vapor, mist, gas" are placed in parentheses. It is intended that the parentheses and the inapplicable forms should be eliminated from the final label. The word "dust" alone should be used for solids that do not have significant vapor pressure. The words "dust and vapor" should be used with solids that have a significant vapor pressure. The word "vapor" should be used for all liquids, and the words "vapor or mist" should be used for those liquids

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whose reasonably foreseeable use is likely to result in the creation of mist. The word "gas" should be used for all gases.

The Statement of Hazard for corrosives includes the word SEVERE in parentheses. The action of a corrosive is described as CAUSES (SEVERE) BURNS. While all burns, in this sense, involve the destruction of tissue, they vary widely in degree of severity depending upon the chemical that produces them. For example, all things being equal, burns from strong acids and alkalies are more severe than those from weak acids and alkalies. It is considered desirable to give the person reading the label some notion of the degree of severity of the injury that can occur. Therefore, the word SEVERE is placed in parentheses in Table I to indicate that its applicability must be left as a matter of judgment. If the action of the corrosive is not rapid or extensive, the word may be omitted. Otherwise, the parentheses should be eliminated, and the word allowed to remain.

The Statement of Hazard for liquids that yield physiologically inert vapors should be VAPOR REDUCES OXYGEN AVAILABLE FOR BREATHING; for physiologically inert gases, it should be GAS REDUCES OXYGEN AVAILABLE FOR BREATHING.

Compressed gases should be described as LIQUID AND GAS UNDER PRESSURE when there is a liquid phase in the container, and as GAS UNDER PRESSURE when there is no liquid phase in the container. This description should be included as a Statement of Hazard together with other applicable statements.

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Labels for Chemicals with Single Hazards

HAZARD:

Highly Toxic by Ingestion

DANGER! MAY BE FATAL IF SWALLOWED

Wash thoroughly after handling.



Call a Physician

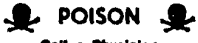
FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

HAZARD:

Highly Toxic by Inhalation

DANGER! MAY BE FATAL IF INHALED

Do not breathe (dust, mist, vapor, gas).*
Keep container closed.
Use only with adequate ventilation.



Call a Physician

FIRST AID: If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

** Select applicable word or words in parentheses.*

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HAZARD:

Highly Toxic by Absorption

DANGER! MAY BE FATAL IF ABSORBED THROUGH SKIN

Do not get in eyes, on skin, on clothing.
Wash thoroughly after handling.



Call a Physician

FIRST AID: In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

HAZARD:

Toxic by Ingestion

WARNING! HARMFUL IF SWALLOWED

Wash thoroughly after handling.

FIRST AID: *If swallowed,* induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

HAZARD:

Toxic by Inhalation

WARNING! HARMFUL IF INHALED

Avoid breathing (dust, mist, vapor, gas).*
Keep container closed.
Use with adequate ventilation.

FIRST AID: *If inhaled,* remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

** Select applicable word or words in parentheses.*

HAZARD:

Toxic by Absorption

WARNING! HARMFUL IF ABSORBED THROUGH SKIN

Avoid contact with eyes, skin, and clothing.
Wash thoroughly after handling.

FIRST AID: In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before re-use. (Discard contaminated shoes.)

HAZARD:

Corrosive, Eye

DANGER! CAUSES (SEVERE) EYE BURNS

Do not get in eyes.
Avoid breathing (dust, vapor, mist, gas).*
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

** Select applicable word or words in parentheses.*

HAZARD:

Corrosive, Eye and Skin

DANGER! CAUSES (SEVERE) BURNS

Do not get in eyes, on skin, on clothing.
Avoid breathing (dust, vapor, mist, gas).*
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before re-use. (Discard contaminated shoes.)

** Select applicable word or words in parentheses.*

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HAZARD:

Irritant, Eye

WARNING! CAUSES EYE IRRITATION

Avoid contact with eyes.
Wash thoroughly after handling.

FIRST AID: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

HAZARD:

Irritant, Eye and Skin

WARNING! CAUSES IRRITATION

Avoid contact with eyes, skin, and clothing.
Wash thoroughly after handling.

FIRST AID: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician. Flush skin with water. (Wash clothing before re-use.)

HAZARD:

Strong Sensitizer, Skin

WARNING! MAY CAUSE ALLERGIC SKIN REACTION

Avoid prolonged or repeated contact with skin.
Wash thoroughly after handling.

FIRST AID: In case of contact, immediately wash skin with soap and plenty of water.

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HAZARD:

Strong Sensitizer, Lungs

WARNING! MAY CAUSE ALLERGIC RESPIRATORY REACTION

Avoid breathing (dust, mist, vapor, gas).*
Keep container closed.
Use with adequate ventilation.

** Select applicable word or words in parentheses.*

HAZARD:

Physiologically Inert Vapor or Gas

CAUTION! (VAPOR) (GAS) REDUCES OXYGEN AVAILABLE FOR BREATHING *

Keep container closed.
Use with adequate ventilation.
Do not enter storage areas unless adequately ventilated.

** Select applicable word or words in parentheses.*

HAZARD:

Extremely Flammable Liquid

DANGER! EXTREMELY FLAMMABLE

Keep away from heat, sparks, and open flame.
Keep container closed.
Use with adequate ventilation.

See Page 65 for selection of appropriate fire-extinguishing statement.

HAZARD:

Flammable Liquid

WARNING! FLAMMABLE

Keep away from heat, sparks, and open flame.
Keep container closed.
Use with adequate ventilation.

See Page 65 for selection of appropriate fire-extinguishing statement.

HAZARD:

Flammable Solid

WARNING! FLAMMABLE

Keep away from heat, sparks, and open flame.

See Page 65 for selection of appropriate fire-extinguishing statement.

HAZARD:

Flammable Gas

DANGER! EXTREMELY FLAMMABLE (GAS) (LIQUID AND GAS) UNDER PRESSURE *

Keep away from heat, sparks, and open flame.
Use with adequate ventilation.
Never drop cylinder.
Keep cylinder out of sun and away from heat.

** Select applicable word or words in parentheses.*

See Page 65 for selection of appropriate fire-extinguishing statement.

HAZARD:

Combustible Liquid

CAUTION! COMBUSTIBLE

Keep away from heat and open flame.

See Page 65 for selection of appropriate fire-extinguishing statement.

HAZARD:

Pyroforic Substance

DANGER! EXTREMELY FLAMMABLE CATCHES FIRE IF EXPOSED TO AIR

Keep away from heat, sparks, and open flame.
Keep container closed.

See Page 65 for selection of appropriate fire-extinguishing statement.

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HAZARD:

Strong Oxidizer

DANGER! STRONG OXIDIZER
CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE

Keep from contact with clothing and other combustible materials.
Do not store near combustible materials.
Store in tightly closed container.
Remove and wash contaminated clothing promptly.

See Page 65 for selection of appropriate fire-extinguishing statement.

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Labels for Chemicals with Multiple Hazards

When a chemical falls into two or more of the hazard classes enumerated in Table I, the precautionary label text will be the sum of all of the statements in the individual classes. **Be certain to refer to all footnotes to Table I to determine the need for additional label statements.**

Some condensation of this information along the following lines is indicated:

1. Only one Signal Word should be used and this should be the Signal Word corresponding to the class of greatest hazard.

2. In the toxicity classes, Statements of Hazard may be combined when the product is equally toxic by more than one route of exposure. Examples of such combinations are: MAY BE FATAL IF SWALLOWED OR INHALED or HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN.

3. When the same Precautionary Measure is applicable to more than one class of hazard, it should not be repeated.

4. When more than one first-aid statement is required, the words FIRST AID and "Call a physician" need not be repeated provided the statements are grouped under a general heading of FIRST AID and the phrase "Call a physician" is positioned in such a way as to be clearly applicable to all first-aid statements. Similarly, the instruction "Never give anything by mouth to an unconscious person." may appear in more than one statement, and this need not be repeated if it is clearly applicable to all of the statements that would otherwise include it.

5. When a product presents hazards by both skin contact and absorption, only one first-aid statement should be used. In such cases, the first-aid statement used should be that applicable to the class of hazard in the following order of priority: Highly Toxic; Toxic; Corrosive, Eye and Skin; Irritant, Eye and Skin; Strong Sensitizer, Skin.

The labels given in this section represent most of the instances in which condensation of label language is desirable. The language for flammability class of hazard does not lend itself to condensation with the language for other classes of hazard. Therefore no example is given.

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HAZARDS:

Highly Toxic by Ingestion

Highly Toxic by Inhalation

DANGER! MAY BE FATAL IF SWALLOWED OR INHALED

Do not breathe (dust, vapor, mist, gas).*
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

** Select applicable word or words in parentheses.*

HAZARDS:

Highly Toxic by Ingestion

Highly Toxic by Absorption

DANGER! MAY BE FATAL IF SWALLOWED OR ABSORBED THROUGH SKIN

Do not get in eyes, on skin, on clothing.
Wash thoroughly after handling.



Call a Physician

FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

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HAZARDS:

Highly Toxic by Ingestion

Toxic by Inhalation

DANGER! MAY BE FATAL IF SWALLOWED
HARMFUL IF INHALED

Avoid breathing (dust, vapor, mist, gas).*
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.
If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

** Select applicable word or words in parentheses.*

HAZARDS:

Highly Toxic by Ingestion

Toxic by Absorption

DANGER! MAY BE FATAL IF SWALLOWED
HARMFUL IF ABSORBED THROUGH SKIN

Avoid contact with eyes, skin, and clothing.
Wash thoroughly after handling.



Call a Physician

FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

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HAZARDS:

Highly Toxic by Inhalation

Highly Toxic by Absorption

DANGER! MAY BE FATAL IF INHALED OR ABSORBED THROUGH SKIN

Do not breathe (dust, vapor, mist, gas).*
Do not get in eyes, on skin, on clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

FIRST AID: If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

* *Select applicable word or words in parentheses.*

HAZARDS:

Highly Toxic by Inhalation

Toxic by Ingestion

DANGER! MAY BE FATAL IF INHALED HARMFUL IF SWALLOWED

Do not breathe (dust, vapor, mist, gas).*
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

FIRST AID: If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

* *Select applicable word or words in parentheses.*

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HAZARDS:

Highly Toxic by Inhalation

Toxic by Absorption

DANGER! MAY BE FATAL IF INHALED
HARMFUL IF ABSORBED THROUGH SKIN

Do not breathe (dust, vapor, mist, gas).*
Avoid contact with eyes, skin, and clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

FIRST AID: If **inhaled,** remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

In **case of contact,** immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

* *Select applicable word or words in parentheses.*

HAZARDS:

Highly Toxic by Absorption

Toxic by Ingestion

DANGER! MAY BE FATAL IF ABSORBED THROUGH SKIN
HARMFUL IF SWALLOWED

Do not get in eyes, on skin, on clothing.
Wash thoroughly after handling.



Call a Physician

FIRST AID: In **case of contact,** immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

If **swallowed,** induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

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HAZARDS:

Highly Toxic by Absorption

Toxic by Inhalation

DANGER! MAY BE FATAL IF ABSORBED THROUGH SKIN HARMFUL IF INHALED

Do not get in eyes, on skin, on clothing.
Avoid breathing (dust, vapor, mist, gas).*
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

FIRST AID: In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

* *Select applicable word or words in parentheses.*

HAZARDS:

Toxic by Ingestion

Toxic by Inhalation

WARNING! HARMFUL IF SWALLOWED OR INHALED

Avoid breathing (dust, vapor, mist, gas).*
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: **If swallowed,** induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

* *Select applicable word or words in parentheses.*

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HAZARDS:

Toxic by Ingestion

Toxic by Absorption

WARNING! HARMFUL IF SWALLOWED OR ABSORBED THROUGH SKIN

Avoid contact with eyes, skin, and clothing.
Wash thoroughly after handling.

FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before re-use. (Discard contaminated shoes.)

HAZARDS:

Toxic by Inhalation

Toxic by Absorption

WARNING! HARMFUL IF INHALED OR ABSORBED THROUGH SKIN

Avoid breathing (dust, vapor, mist, gas).*
Avoid contact with eyes, skin, and clothing.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before re-use. (Discard contaminated shoes.)

** Select applicable word or words in parentheses.*

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HAZARDS:

Strong Sensitizer, Skin

Strong Sensitizer, Lungs

WARNING! MAY CAUSE ALLERGIC SKIN OR RESPIRATORY REACTION

Avoid breathing (dust, vapor, mist, gas).*
Avoid prolonged or repeated contact with skin.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: In case of contact, immediately wash skin with soap and plenty of water.

* *Select applicable word or words in parentheses.*

HAZARDS:

Highly Toxic by Ingestion

Highly Toxic by Inhalation

Highly Toxic by Absorption

DANGER! MAY BE FATAL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN

Do not breathe (dust, vapor, mist, gas).*
Do not get in eyes, on skin, on clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

* *Select applicable word or words in parentheses.*

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HAZARDS:

Highly Toxic by Ingestion

Highly Toxic by Inhalation

Toxic by Absorption

DANGER! MAY BE FATAL IF SWALLOWED OR INHALED
HARMFUL IF ABSORBED THROUGH SKIN

Do not breathe (dust, vapor, mist, gas).*
Avoid contact with eyes, skin, and clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

** Select applicable word or words in parentheses.*

HAZARDS:

Highly Toxic by Ingestion

Highly Toxic by Absorption

Toxic by Inhalation

DANGER! MAY BE FATAL IF SWALLOWED OR ABSORBED THROUGH SKIN
HARMFUL IF INHALED

Do not get in eyes, on skin, on clothing.
Avoid breathing (dust, vapor, mist, gas).*
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

** Select applicable word or words in parentheses.*

HAZARDS:

Highly Toxic by Ingestion

Toxic by Inhalation

Toxic by Absorption

DANGER! MAY BE FATAL IF SWALLOWED
HARMFUL IF INHALED OR ABSORBED THROUGH SKIN

Avoid breathing (dust, vapor, mist, gas).*
Avoid contact with eyes, skin, and clothing.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

** Select applicable word or words in parentheses.*

HAZARDS:

Highly Toxic by Inhalation

Highly Toxic by Absorption

Toxic by Ingestion

DANGER! MAY BE FATAL IF INHALED OR ABSORBED THROUGH SKIN HARMFUL IF SWALLOWED

Do not breathe (dust, vapor, mist, gas).*
Do not get in eyes, on skin, on clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

FIRST AID: If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

** Select applicable word or words in parentheses.*

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HAZARDS:

Highly Toxic by Inhalation

Toxic by Ingestion

Toxic by Absorption

DANGER! MAY BE FATAL IF INHALED
HARMFUL IF SWALLOWED OR ABSORBED THROUGH SKIN

Do not breathe (dust, vapor, mist, gas).*
Avoid contact with eyes, skin, and clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

3T AID: If inhaled, remove to fresh air. If not breathing give artificial ıration, preferably mouth-to-mouth. If breathing is difficult, give ;en.

#allowed, induce vomiting by sticking finger down throat or by giving .py or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

* *Select applicable word or words in parentheses.*

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HAZARDS:

Highly Toxic by Absorption

Toxic by Ingestion

Toxic by Inhalation

DANGER! MAY BE FATAL IF ABSORBED THROUGH SKIN HARMFUL IF SWALLOWED OR INHALED

Do not get in eyes, on skin, on clothing.
Avoid breathing (dust, vapor, mist, gas).*
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.



Call a Physician

FIRST AID: In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. (Discard contaminated shoes.)

If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Never give anything by mouth to an unconscious person.

If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen.

* *Select applicable word or words in parentheses.*

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HAZARDS:

Toxic by Ingestion

Toxic by Inhalation

Toxic by Absorption

WARNING! HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN

Avoid breathing (dust, vapor, mist, gas).*
Avoid contact with eyes, skin, and clothing.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FIRST AID: If swallowed, induce vomiting by sticking finger down throat or by giving soapy or strong salty water to drink. Repeat until vomit is clear. Call a physician. Never give anything by mouth to an unconscious person.

If inhaled, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before re-use. (Discard contaminated shoes.)

** Select applicable word or words in parentheses.*

LABEL STATEMENTS NOT APPEARING IN TABLE I

The Statements of Hazard, Precautionary Measures, and other instructions suggested in Table I are intended to apply only to the common *classes* of hazards. No representation is made or intended that they are sufficiently informative to describe *all* of the hazardous properties a chemical may possess. Many chemicals possess uncommon hazards including some that may be specific for a particular chemical.

It is obviously impossible to suggest any standard or uniform language for describing hazards of this nature. However, the list of chemicals starting on page 52 (keyed to the statements starting on pages 57 and 58) will be helpful in informing persons writing precautionary labels of the existence of special conditions which may require unusual or highly specific language, and will aid these persons in understanding the proper application of the various statements.

The examples of specific statements shown in this section have been collected, and in some cases reworded slightly for overall consistency, from precautionary labeling texts appearing in the 1961 edition of Manual L-1 and in MCA Chemical Safety Data Sheets. It is not intended to imply that every chemical to which a particular statement may be applicable has been listed, or that a statement has been included for every possible special or specific situation.

Most of these statements are self explanatory, but a few of the distinctions between some of the statements and those shown in Table I merit additional explanation. For example, many chemicals are irritating if breathed, but frequently this presents no particularly serious hazard. The recommendation for use of a statement such as VAPOR EXTREMELY IRRITATING is usually made when the irritation is so intense it will temporarily immobilize or pain the person, so that even though no serious lasting harm may result, it is desirable to advise of this potential hazard before the container is opened.

The term HIGHLY VOLATILE is recommended as an additional Statement of Hazard for certain chemicals. Volatility, in and of itself, is not necessarily a hazard, but if there is a flammability or inhalation hazard it is considered important to point out the probability of an increase in this hazard due to the high volatility of the material.

In some cases where unusually severe hazards are present, an extra message such as EXTREMELY HAZARDOUS LIQUID AND VAPOR is desirable. For deciding this point, the exercise of good judgment based on an analysis of the facts with respect to a certain chemical—

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compared with data on similar chemicals which carry the same Statements of Hazard—may well justify adding an extra attention-getting statement.

The term RAPIDLY ABSORBED THROUGH SKIN is recommended as an additional Statement of Hazard for some products which are harmful by rapid skin absorption, but it would not be used as the sole Statement of Hazard. Again, the exercise of good judgment and observation in judging speed of absorption during the early stages of animal tests or from human experience from exposure will be helpful in deciding whether to add this statement to other Statements of Hazard, such as MAY BE FATAL IF ABSORBED THROUGH SKIN or HARMFUL IF ABSORBED THROUGH SKIN.

Many of the suggested additional Statements of Hazard will need supplemental precautionary measures or other instructions which do not appear in Table I or in the Instructions for Container Handling and Storage; Instructions in Case of Fire, Spill, or Leak; Antidotes; and Notes to Physicians sections of this manual. Examples of such precautionary measures and other instructions are included in this listing. Furthermore, there may be regulatory requirements for the use of the word POISON and the skull and crossbones symbol on the labels of certain chemicals that are not actually highly toxic as defined on page 12.

MCA publishes a number of safety bulletins for guidance in handling and using chemicals safely. Among these are Chemical Safety Data Sheets which give detailed information as to the safe handling of these chemicals. These are available at nominal cost from the Association headquarters. In addition, many chemical manufacturers and suppliers publish similar safety bulletins for the guidance of their customers which are provided on request.

Often there is not enough space on a container label to supply all the safety information adequate for the proper handling of a hazardous chemical. A suitable means of providing the necessary additional detailed instructions is through these various safety bulletins. In previous editions of the manual, many of the illustrative labels included a statement referring to the availability of further safety information, and this recommendation is retained here. Examples of such references are included in the following listing. Such label information, however, cannot take the place of the education of personnel regarding product hazards and the use of safety clothing and equipment. This education is, and must remain, the direct responsibility of their employers.

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Chemicals with Key Numbers

	Statements of Hazard	Additional Statements
Acetaldehyde	31	41, 132, 133
Acetic Acid, Glacial		89, 132
Acetic Acid, 80%		132
Acetic Acid, 56%–70%		132
Acetic Acid, 28%		132
Acetic Anhydride		132
Acetone		41, 128, 132
Acetyl Chloride		84
Acetylene		132
Acrolein		132
Acrylonitrile		77, 132
Allyl Alcohol	3	79
Aluminum Chloride, Anhydrous		100, 102, 132
Ammonia, Anhydrous	11, 35	132
Ammonia, Aqua	9	102, 132
Ammonium Dichromate	20	39, 82, 132
Ammonium Hydroxide	9	102, 132
Amyl Acetate (Mixed Isomers)	38	41, 128
Aniline	3	132
Antimony Trichloride		132
Arsenic Trioxide		40, 132
Benzene (Benzol)		41, 129, 132
Benzidine Hydrochloride	2	82
Benzidine Sulfate	2	82
Benzoyl Peroxide	26	61, 82, 107, 130
Benzoyl Peroxide (Wet)	26	61, 82, 107, 108, 130
Benzyl Chloride (Stabilized)		132
Benzyl Chloride (Unstabilized)	34	90, 132
Beryllium Oxide Powder		92
Bromine	9	67, 70, 86, 132
Butadiene (Inhibited)	31	132, 133
Butyl Acetate (normal)	38	41, 128
Butyl Alcohol (normal or secondary)		41
Butyl Alcohol (tertiary)		41, 128
Butyl Chloride (normal)		41
Butyl Ether (normal)	31	41, 63, 128, 133
Butyllithium (normal) (In hydrocarbon solvents)		73, 99, 121, 130
Butyraldehyde (iso or normal)		132
Calcium Carbide		132
Calcium Cyanide	17	91, 122
Carbon Dioxide, Solid ("Dry Ice")	16, 37	66, 80, 93
Carbon Disulfide	8	97, 128, 132
Carbon Tetrachloride		79, 129, 132

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	Statements of Hazard	Additional Statements
Caustic Potash		59, 73, 79, 124, 130
Caustic Soda		59, 73, 79, 124, 130
Chloral	6	84
Chlorinated Diphenyl (Mono, Di, or Tri)	36	41, 128
Chlorinated Diphenyl Oxide (Mono, Di, or Tri)	36	41, 128
Chlorinated Naphthalene (For Tri and Higher)	36	41, 128
Chlorine	35	110, 130
Chlorobenzene (Mono)		41, 128
Chloroform		79, 128, 132
Chlorophenol (Monochlorophenol) (ortho, meta, or para)	3	79
Chlorosulfonic Acid	7, 13	50, 84, 132
Chromium Trioxide (Chromic Acid)	21	82, 132
Cholinesterase Inhibitors	18	
Creosote Oil (Coal Tar Creosote)		41
Cresol (Cresylic Acid)	3	79, 132
Cyanides, Inorganic (Excluding Hydrocyanic Acid and Calcium Cyanide)	14	112, 130
Cyclohexane		41, 128, 132
Cyclohexenol		41, 128
Cyclohexanone		41, 128
Decaborane	32	47, 68, 130
Diborane	11	48, 69, 81, 130
Dichlorobenzene (ortho)		128, 132
Dichloroethylene		41, 79, 128
2,4-Dichlorophenol		79
Diethylamine		43, 132
Diethylenetriamine		41, 132
Dimethylamine, Anhydrous	9, 35	69, 85, 132
Dimethyl Sulfate	12	73, 130
2,4-Dinitrotoluene		125, 130
Dinitrotoluene (Oily)	3	125, 130
Dioxane (1,4-Diethylene Dioxide)	31	83, 128, 133
Ethyl Acetate		41, 128, 132
Ethyl Acrylate		132
Ethyl Chloride		132
Ethyl Ether	29, 31	41, 83, 128, 132
Ethylene Chlorohydrin (Anhydrous or 38%)		42
Ethylene Dichloride		79, 128, 132
Ethylene Oxide		132
Formaldehyde Solution		41, 132

	Statements of Hazard	Additional Statements
Hafnium Metal Powder	33	60, 71, 72, 101,
(Min. 25% Water)		119, 126, 130
Hydrochloric Acid (Muriatic Acid)		132
Hydrocyanic Acid	36	67, 130
Hydrofluoric Acid, Aqueous	19	66, 130
Hydrogen Chloride, Anhydrous	11, 35	94, 132
Hydrogen Peroxide	29	46, 49, 51,
(27.5–52%)		78, 95, 96,
		113, 114, 132
Hydrogen Peroxide,		
High Strength	23, 30	45, 52, 53,
(Over 52%)		78, 96, 98,
		113, 114, 130
Hydrogen Sulfide	35	61, 120, 132
Isopropylamine		132
Isopropyl Ether	29, 31	41, 63, 128
Lead Monoxide (Litharge)		132
Lead Oxide (Red Lead)		132
Maleic Anhydride		132
Mercuric Chloride		82
(Mercury Bichloride)		
Methanol	1	129, 132
Methyl Acrylate		132
Methylamines, Anhydrous	9, 35	69, 85, 132
Methylamines, Aqueous		
Solutions		43, 132
Methyl Bromide	6, 22, 35, 38	75, 109, 130
Methyl Chloride		128, 132
Methylene Chloride	38	41, 128, 132
Methyl Ethyl Ketone		41, 128, 132
Methyl Methacrylate Monomer		41
Mixed Acid (Sulfuric and Nitric)	4, 5	132
Muriatic Acid (Hydrochloric Acid)		132
Naphthalene		132
Naphthylamine (alpha)	2	82, 132
(Containing beta-Naphthylamine)		
Naphthylamine (beta)	2	82, 132
Nitric Acid	4, 5	132
Nitroaniline	3	132
(ortho, meta, or para)		
Nitrobenzene	3, 36	130
Oleum (Fuming Sulfuric Acid)		64, 132
Paraformaldehyde		44, 132
Paraldehyde		54, 79
Pentaborane	32	47, 68, 130
Perchloric Acid	27	103, 109,
		123, 132

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	Statements of Hazard	Additional Statements
Perchloroethylene (Tetrachloroethylene)		79, 128, 132
Phenol	3	132
Phenylenediamine (meta or para)		44
Phosgene	8	67, 132
Phosphoric Acid		132
Phosphoric Anhydride (Phosphorus Pentoxide)		64, 73, 132
Phosphorus, White or Yellow (Wet)		55, 74, 132
Phosphorus Oxychloride	7	64, 132
Phosphorus Pentachloride		73
Phosphorus Pentasulfide	15	58, 100, 132
Phosphorus Pentoxide (Phosphoric Anhydride)		64, 73, 132
Phosphorus Trichloride	9, 24	65, 132
Phthalic Anhydride (Solid)		132
Potassium Dichromate	20	39, 82, 132
Potassium Hydroxide		59, 73, 79, 124, 130
Propylene		132
Pyridine		128
Sodium Chlorate		83, 104, 127, 132
Sodium Cyanide	14	112, 118, 130
Sodium Dichromate	20	39, 82, 132
Sodium Hydrosulfite	25	58, 106, 116
Sodium Hydroxide		59, 73, 79, 124, 130
Sodium Metal	28	57, 76, 88, 100, 115, 132
Sodium Orthosilicate		59, 73, 79
Sodium Sesquisilicate, Anhydrous		59, 73, 79
Sodium Sulfhydrate	14	111, 117
Sodium Sulfide (Containing 35% or more combined water)	14	111, 117
Styrene Monomer		128, 132
Sulfur		132
Sulfur Chloride		64, 132
Sulfur Dichloride		64, 132
Sulfur Dioxide	10	132
Sulfuric Acid		64, 132
Sulfuryl Chloride		64, 132
Tar Acids	3	79
Tetrachloroethane		67, 132
Tetrachloroethylene (Perchloroethylene)		79, 128, 132

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	Statements of Hazard	Additional Statements
Thionyl Chloride		64, 132
Titanium Trichloride, Anhydrous		73, 87, 105, 131
Toluene (Toluol)		128, 132
Toluidine (ortho or meta)	3	132
Toluidine (para)	3	132
1, 1, 1-Trichloroethane	38	41, 128, 132
Tolylene Diisocyanate		132
Trichloroethylene		79, 128, 132
Trimethylamine, Anhydrous	9, 35	69, 85, 132
Trimethylcyclohexanol		41, 128
Vanadium Tetrachloride		73, 105, 131
Vinyl Acetate		41, 128, 132
Vinyl Chloride		41, 128, 132
Xylene (Xylol)		41
Xylidines	3	
Zirconium Metal Powder (Minimum 25% Water)	33	60, 71, 72, 101, 119, 126, 130

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Statements of Hazard

1. MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED
   CANNOT BE MADE NON-POISONOUS
2. REPEATED ABSORPTION MAY RESULT IN BLADDER TUMORS
3. RAPIDLY ABSORBED THROUGH SKIN
4. MAY CAUSE NITROUS GAS POISONING
5. SPILLAGE MAY CAUSE FIRE OR LIBERATE DANGEROUS GAS
6. INHALATION MAY BE FATAL OR CAUSE DELAYED LUNG
   INJURY
7. HARMFUL IF INHALED AND MAY CAUSE DELAYED LUNG
   INJURY
8. HIGHLY VOLATILE
9. VAPOR EXTREMELY IRRITATING
10. EXTREMELY IRRITATING GAS AND LIQUID UNDER PRESSURE
11. GAS EXTREMELY IRRITATING
12. LUNG INJURY AND BURNS MAY BE DELAYED
13. CONTACT WITH WATER OR MOIST AIR LIBERATES
    IRRITATING GAS
14. CONTACT WITH ACID LIBERATES POISONOUS GAS
15. CONTACT WITH WATER OR ACID SLOWLY LIBERATES
    POISONOUS AND FLAMMABLE HYDROGEN SULFIDE GAS
16. LIBERATES HEAVY GAS WHICH MAY CAUSE SUFFOCATION
17. LIBERATES POISONOUS GAS
18. REPEATED INHALATION OR SKIN CONTACT MAY, WITHOUT
    SYMPTOMS, INCREASE SUSCEPTIBILITY
19. CAUSES SEVERE BURNS WHICH MAY NOT BE IMMEDIATELY
    PAINFUL OR VISIBLE
20. MAY CAUSE RASH OR EXTERNAL ULCERS
21. MAY CAUSE BURNS OR EXTERNAL ULCERS
22. LIQUID OR VAPOR CAUSES BURNS WHICH MAY BE
    DELAYED
23. CAUSES SEVERE BURNS—EFFECTS ON EYES MAY BE
    DELAYED
24. CONTACT WITH WATER MAY CAUSE FLASH FIRE
25. MAY IGNITE IF ALLOWED TO BECOME DAMP
26. HEAT, SHOCK, OR CONTACT WITH OTHER MATERIALS MAY
    CAUSE FIRE OR EXPLOSIVE DECOMPOSITION
27. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE OR
    EXPLOSION, ESPECIALLY IF HEATED
28. REACTS VIOLENTLY WITH WATER LIBERATING AND
    IGNITING HYDROGEN
29. MAY CAUSE EYE INJURY—EFFECTS MAY BE DELAYED
30. POWERFUL OXIDIZER
31. MAY FORM EXPLOSIVE PEROXIDES
32. FORMS SHOCK-SENSITIVE MIXTURES WITH CERTAIN OTHER
    MATERIALS
33. MAY EXPLODE IF WATER CONTENT IS 10% OR BELOW
34. CONTAMINATION MAY RESULT IN DANGEROUS PRESSURE
35. LIQUID AND GAS UNDER PRESSURE

36. EXTREMELY HAZARDOUS LIQUID AND VAPOR UNDER PRESSURE
37. EXTREMELY COLD (109°F. BELOW ZERO)
38. In some cases the total hazard of a product, while justifying one or more precautionary measures or other instructions, may be of such order as to require no statement of hazard.

Additional Statements

39. Avoid breathing dust or solution spray.
40. Avoid breathing dust or spray mist.
41. Avoid prolonged or repeated breathing of vapor.
42. Ordinary rubber protective clothing, including gloves, will not prevent skin absorption.
43. Avoid exposure to vapor.
44. Avoid breathing dust or vapor.
45. Wear goggles; neoprene, butyl rubber, or vinyl gloves; neoprene shoes or boots; and clean protective outer clothing.
46. Wear goggles; neoprene, butyl rubber, or vinyl gloves.
47. Keep from contact with oxidizing materials, highly oxygenated or halogenated solvents, organic compounds containing reducible functional groups, or aqueous ammonia.
48. Keep from contact with oxidizing materials.
49. Avoid contamination from any source including metals, dust, and organic materials. Such contamination may cause rapid decomposition, generation of large quantities of oxygen gas, and high pressures.
50. Keep from contact with clothing and other combustible materials to avoid fire.
51. Drying of this product on clothing or combustible materials may cause fire.
52. Keep from contamination from any source including metals, dust, and organic materials. Such contamination can cause rapid decomposition, generation of high pressures, or formation of explosive mixtures.
53. Spills on clothing or combustible materials will cause fire.
54. Solidifies at about 54°F. (12°C.) and may break container. Store in moderately warm place.
55. Contents packed under water and will ignite if water is removed.
56. Avoid friction or rough handling because of fire hazard.
57. Keep from any possible contact with water.
58. Use only dry, clean utensils in handling.
59. While making solutions, add slowly to surface to avoid violent spattering.
60. Keep wet in storage—dry powder may ignite by friction, static electricity, or heat.
61. Do not add to hot materials; do not grind or subject to frictional heat or shock—explosive decomposition may result.
62. Prevent contamination with readily oxidizable materials and polymerization accelerators.
63. Do not allow to evaporate to near dryness. Addition of water or appropriate reducing agents will lessen peroxide formation.

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64. Do not allow water to get into container because of violent reaction.
65. Do not add water to contents while in a container because of violent reaction and possible flash fire.
66. Do not enter places where used or stored until adequately ventilated.
67. Use only with adequate ventilation and in closed systems.
68. Always wear a self-contained breathing apparatus or full-face air-line respirator when using this chemical.
69. Have available emergency self-contained breathing apparatus or full-face air-line respirator when using this chemical.
70. Have available emergency gas masks approved by U.S. Bureau of Mines for Bromine Service.
71. Do not attempt to loosen or remove material from container with any tool.
72. Wear goggles or face shield and fire-retardant clothing when handling.
73. Wear goggles or face shield, rubber gloves, and protective clothing when handling.
74. Wear heavy rubber gloves and goggles or face shield.
75. Do not wear ordinary rubber protective clothing, including gloves and boots.
76. Wear goggles and DRY gloves when handling.
77. Liquid penetrates leather shoes causing delayed burns.
78. Put nothing else in this container.
79. Do not take internally.
80. Do not taste.
81. This gas deadens the sense of smell. Do not depend on odor to detect presence of gas.
82. Use fresh clothing daily. Take hot shower after work using plenty of soap.
83. Clothing and vegetation contaminated with chlorate or its solutions are DANGEROUSLY FLAMMABLE. Remove clothing and wash thoroughly with water. Keep persons and animals off treated areas.
84. In case of inhalation or suspicion of inhalation, move patient at once to fresh air and call a physician. Keep patient absolutely quiet and start oxygen inhalation through suitable equipment.
85. Call a physician at once in case of burns, especially to eyes, nose, and throat or if patient is unconscious.
86. Flush eyes for at least 30 minutes.
87. In case of contact, immediately remove from skin with dry cloth followed by flushing with plenty of water for at least 15 minutes; for eyes, flush with plenty of water for at least 15 minutes; get medical attention. Remove contaminated clothing and wash before re-use.
88. Skin: Remove SODIUM and flush effected area with water.

89. Glacial Acetic Acid freezes at 62°F. forming hard lumps which may break carboy when moved. Store in area maintained above 62°F. If frozen, thaw by carefully moving carboy to warm area.
90. Keep dry and handle only in suitable equipment to prevent metallic contamination. Consult manufacturer.
91. Keep container tightly closed and away from water or acids.
92. Keep container tightly closed; flush container clean before discarding.
93. Do not put in stoppered or closed container.
94. Note: Suck-back into cylinder may cause explosion. Under no circumstances should the cylinder entry tube be inserted in a liquid or gas without a vacuum break or other protective apparatus in the line to prevent suck-back.
95. When empty, rinse thoroughly with clean water before discarding. (Do not use this statement on returnable drums.)
96. Store in original vented container.
97. Store in cool place.
98. Keep drum in upright position. Do not roll drum on side.
99. Handle under inert gas atmosphere in DRY equipment.
100. Keep container tightly closed.
101. Keep from freezing.
102. Loosen closure cautiously before opening.
103. Store seperately from, and avoid contact with, dehydrating agents and other materials.
104. Keep away from fire.
105. Open container carefully and only in dry oxygen-free or inert atmosphere.
106. Store in cool dry place.
107. Store in a cool place in original container and protect from direct sunlight.
108. Keep container closed to prevent drying out.
109. Keep away from heat.
110. Do not heat cylinders.
111. Keep away from acids and heat.
112. Keep away from acids. Store in a dry place.
113. When empty, drain thoroughly. REPLACE BUNGS SECURELY. (Use this statement only on returnable drums.)
114. Never return unused HYDROGEN PEROXIDE to container. Dilute with plenty of water and discard.
115. Dispose of sodium by burning carefully in an open fire.
116. In case of fire, smother with Soda Ash, dry sand, or Carbon Dioxide. Dispose of by flushing away with a large volume of water under adequate ventilation.
117. Sweep up spillage. Do not flush to sewer which may contain acid.
118. Treat spillage with strong calcium hypochlorite solution and flush to sewer.
119. In case of spillage, keep wet and remove carefully.
120. In case of fire, stop flow of gas. Use dry chemical or carbon dioxide when necessary to gain access to valve.
121. Avoid spillage and contact with moisture or combustibles.

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122. Clean up spillage immediately.
123. In case of spillage, flush with plenty of water and remove contaminated articles.
124. Flush area with water spray.
125. Fire or high temperatures may cause explosive decomposition if confined.
126. In case of fire, smother with dry sand, dry ground limestone, or dry powder type agents specially designed for metal powder fires. Do not use carbon tetrachloride, CO_2 extinguishers, or water.
127. Spillage may cause fire. Do not get on floor. Sweep up and remove immediately.
128. Avoid prolonged or repeated contact with skin.
129. POISON with skull and crossbones vignette.
130. DO NOT HANDLE OR USE UNTIL SAFETY PRECAUTIONS IN MCA CHEMICAL SAFETY DATA SHEET SD-..... HAVE BEEN READ AND UNDERSTOOD.
131. DO NOT HANDLE OR USE UNTIL SAFETY PRECAUTIONS RECOMMENDED BY THE MANUFACTURER HAVE BEEN READ AND UNDERSTOOD.
132. MCA CHEMICAL SAFETY DATA SHEET SD-..... AVAILABLE.
133. Do not use air pressure to transfer.

In some cases, a minor hazard may be covered clearly and briefly by an appropriate precautionary statement.

Examples of these situations would include the use of a statement such as "Avoid prolonged or repeated contact with skin." as adequate to cover the minor hazard of skin defatting (which may result in chapping of the skin) such as is presented by some esters, ethers, ketones, or chlorinated hydrocarbon solvents. A statement such as "Avoid prolonged or repeated breathing of vapor." might also be adequate for those chemicals which do not present a significant vapor hazard but which may result in a temporary narcotic, soporific, or euphoric effect.

ANTIDOTE STATEMENTS

While it is generally true that specific antidotes are known for only very few chemicals and many of these can be administered only by a physician, there are some measures which may be used by laymen with benefit. The MCA Occupational Health Committee has provided the following specific examples of *some* of these. Others may be developed by the user of this manual for appropriate application to other chemicals.

1. For acid corrosive substances that are not toxic or highly toxic by ingestion: *Antidote.* If swallowed, do NOT induce vomiting. Give large quantities of water. Give at least one ounce of milk of magnesia or aluminum hydroxide gel in an equal amount of water. If these are not available, the whites of two or three eggs may be used. Never give anything by mouth to an unconscious person. Call a physician.

2. For alkaline corrosive substances that are not toxic or highly toxic by ingestion: *Antidote.* If swallowed, do NOT induce vomiting. Give large quantities of water. Give at least one ounce of vinegar in an equal amount of water. Never give anything by mouth to an unconscious person. Call a physician.

3. For cyanides and cyanide-like substances: *Antidote.* Always have on hand a cyanide first-aid kit. Break an amyl nitrite pearl in a cloth and hold lightly under nose for 15 seconds. Repeat 5 times at about 15-second intervals. Call a physician.

4. For hydrofluoric acid, anhydrous or aqueous: *Antidote.* Always have on hand a supply of magnesia paste (magnesium oxide and glycerin). In case of contact or suspicion of contact, immediately flush skin with large quantities of cold water until all acid is removed (3 to 4 hours or until medical attention is obtained), paying particular attention to skin under nails. If medical attention is delayed, apply magnesia paste. For eyes, immediately flush with cool water for 15 to 30 minutes. Prompt medical attention is absolutely necessary.

5. For soluble barium salts: *Antidote.* If swallowed, induce vomiting and then give one tablespoon of epsom salt in a glass of water. Never give anything by mouth to an unconscious person. Call a physician.

6. For cholinesterase-inhibiting compounds that are highly toxic: *Antidote.* Atropine is an antidote. Consult your physician about obtaining a supply of 1/100 grain (0.6 milligram) tablets for emergency use. If symptoms include blurred vision, stomach cramps or tightness in chest, don't wait for a physician but take two tablets at once. Do not

take atropine unless symptoms of poisoning have occurred. Anyone who has been sick enough to have taken atropine must be seen by a physician as soon as possible.

NOTES TO PHYSICIANS

Physicians may not always be familiar with specific antidotes for given chemicals or with specific practices found useful by experts in the management of some poisonings.

It may, in certain cases, be desirable to acquaint the physician with an antidote or with a specific form of medical management through a Note to Physicians on the label. Some examples, as provided by the MCA Occupational Health Committee, are given below. The user of the manual may wish to discuss with his medical consultant the need for or appropriateness of a Note to Physicians in the labeling of his products. The Note to Physicians should be prepared by physicians.

1. For soluble arsenic compounds: *Note to Physicians.* If swallowed, give gastric lavage followed by saline cathartic. Force fluids. In all cases, give dimercaprol (BAL) in recommended dosages.

2. For cholinesterase-inhibiting compounds that are highly toxic: *Note to Physicians.* Warning symptoms include weakness, headache, tightness of chest, blurred vision, nonreactive pinpoint pupils, salivation, sweating, nausea, vomiting, diarrhea, and abdominal cramps. Give atropine intramuscularly or intravenously, depending on severity of poisoning, 2 to 4 milligrams (3 to 6 tablets, 1/100 grain each) every 15 minutes until fully atropinized as shown by dilated pupils, dry flushed skin and tachycardia. Twenty to thirty milligrams, or more, may be required during the first 24 hours. Never give opiates or phenothiazine tranquilizers. Clear chest by postural drainage. Artificial respiration or oxygen administration may be necessary. Observe patient continuously for at least 48 hours. Allow no further exposure to any cholinesterase inhibitor until cholinesterase regeneration has taken place as determined by blood tests.

3. For cyanides and cyanide-like substances: *Note to Physicians.* If patient has not responded to amyl nitrite, inject intravenously 10 milliliters of a 3 percent solution of sodium nitrite at a rate not greater than 2.5 to 5.0 milliliters per minute. Follow directly with 50 milliliters of a 25 percent solution of sodium thiosulfate at the same rate by the same route. Keep patient under observation. If signs of poisoning persist or reappear, repeat nitrite and thiosulfate injections one hour later in one-half the original doses.

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4. For methemoglobin-inducing compounds: *Note to Physicians.* Absorption of this product into the body leads to the formation of methemoglobin which, in sufficient concentration, causes cyanosis. Since reversion of methemoglobin to hemoglobin occurs spontaneously after termination of exposure, moderate degrees of cyanosis need be treated only by supportive measures such as bed rest and oxygen inhalation. Thorough cleansing of the entire contaminated area of the body including scalp and nails is of utmost importance. If cyanosis is severe, intravenous injection of methylene blue, 1 milligram per kilogram of body weight, may be of value.

MONS 095891

6-12-75 another form of L-1 pages 65 + 66 [illegible]

KES

Instructions in case of Fire, Spill or Leak

Select applicable instructions from the following Tables for most fire or leak situations. Special properties or situations must be recognized and may require instructions more suited to the condition.

Table II

Fire Action

In case of: A2,13

Type of product	Fire Extinguishing Statements
For water-soluble or dilutable liquids.	In case of Fire, use water (flood with water), dry chemical or CO_2. * A2,14
For water-immiscible liquid.	In case of Fire, use water spray, foam (alcohol foam), dry chemical or CO_2. * A2,15
For solids such as oxidizing agents where water is appropriate and not dangerous.	In case of Fire, soak (flood) with water. A2,16
For solids or liquids where water may cause dangerous reaction.	In case of Fire, do not use water. Use dry (sand) (earth) (salt) (soda ash) (lime). * A2,17
For flammable gases	In case of Fire, allow gas to burn if flow cannot be shut off immediately. Apply water from a safe distance to cool container and protect surrounding area. A2,18

* substitute or add appropriate words in parentheses.

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FIRE

KES

Table III

Spill or Leak Action

In case of: A2,B

Type of product.	Spill or Leak Contents.
For most liquids.	Flush spill (area) with water (spray). * A2,17
For liquids where water may cause dangerous reaction or otherwise create further hazard (such as in sewer).	In case of Spill or leak, do not use water. Soak up with sand or earth. A2,20
For materials which generate vapor or fumes with water.	In case of Spill or leak, flush away with water applied quickly to entire spill. [Neutralize (washings) (spill area) with soda ash or lime.] * A2,21
For compressed gases.	In case of Leak, keep upwind; evacuate enclosed spaces until gas has dispersed. (Flush area with water spray.) * A2,22
For most solids. (When appropriate, add instructions for disposal of swept-up material.)	In case of Spill, sweep (scoop) up and remove. Flush Spill area with water. * A2,23

*substitute or add appropriate words in parentheses.

MONS 095893

SPILL OR LEAK

INSTRUCTIONS IN CASE OF FIRE, SPILL, OR LEAK

Accident instructions should be as simple and brief as possible and advise the use of suitable materials for control. Labels should provide persons who handle containers during shipment and storage with appropriate instructions.

For large fires, water is about the only practicable controlling or extinguishing agent, and is recommended in some form in almost all cases. In special cases where water would be ineffective or cause a dangerous reaction, the label statement should specifically exclude its use.

For small fires and where water may not be available, CO_2 (carbon dioxide) and dry-chemical fire extinguishers are generally recommended.

The amount of spillage or leak associated with handling containers is usually small. In view of this, the most convenient method for removing a liquid from the work area is to flush with copious quantities of water. Use of water as a spray rather than as a direct stream is effective in "knocking down" ignitable vapors.

In special cases where water would cause a dangerous reaction, the label statement should recommend an alternate method using generally available materials.

The following is a group of suitable phrases that may be used on labels of hazardous chemicals as steps to be taken in case of fire, spill, or leak. *Applicable phrases may be selected* from these statements or from others appearing in the special statements beginning on page 50. These may be used either as separate labels or as a part of the precautionary label text.

Fire-Extinguishing Statements

In case of fire, use water, dry chemical, or CO_2.
(Use for ignitable liquids that are water-soluble or dilutable and for solids, provided water and/or CO_2 are suitable for confining and extinguishing the flames.)

In case of fire, use water spray, foam, dry chemical, or CO_2.
(Use for ignitable liquids that are immiscible with water.)

In case of fire, do not use water. Use dry sand, salt, soda ash, or lime.
(Use for special cases where water would cause dangerous reaction.)

In case of fire, soak with water.
(Use for solids such as oxidizing agents, where water is effective and not dangerous.)

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In case of fire, cover with water, sand, or earth.
(Use where water is effective but must be used properly to confine and control the fire.)

In case of fire, allow gas to burn if flow cannot be shut off immediately.
(Use for flammable gases.)

Spill or Leak Statements

Flush spill area with water spray.
(Use for most liquids.)

Soak up spill with sand or earth. Do not use water.
(Use where water would cause a dangerous reaction, or would create a further hazard.)

Flush away spill by flooding with water applied quickly to entire spill.
(Use for products that require proper use of much water to minimize irritating fumes that are given off when water contacts the product.)

Keep upwind of leak; evacuate enclosed places until gas has dispersed.
(Use for compressed gases.)

INSTRUCTIONS FOR CONTAINER HANDLING AND STORAGE

Care should always be exercised in handling and storing containers of hazardous chemicals and in removing the contents. The Chemical Packaging Committee of the Manufacturing Chemists Association has recommended the general precautions given below for handling and storing certain classes of containers. *Applicable phrases may be selected from these statements.* These may be used either as separate labels or as a part of the precautionary label text.

Metal Drums (For Liquids and Semi-Liquids)

Keep closure up to prevent leakage.

Keep drum out of sun and away from heat.

Relieve internal pressure when received and at least weekly thereafter by slowly loosening plug. Retighten immediately.

Drums should be grounded when being emptied.

Do not drop or slide across sharp projection.

Never use pressure to empty; drum is not a pressure vessel.

Keep lights, fire, and sparks away from drums.

Drum must not be washed out or used for other purposes.

Replace plug after each withdrawal and return with empty drum.

Do not expose drum to direct sunlight for long periods of time.

Glass Carboys

Before moving carboy be sure closure is securely fastened.

Avoid rough handling or dropping.

Loosen closure carefully.

Keep carboy out of sun and away from heat.

Never use pressure to empty; carboy is not a pressure vessel.

Completely drain carboy before returning.

Wooden Barrels (For Liquids and Semi-Liquids)

Keep barrel out of sun and away from heat.

Store with bilge bung up.

Never use pressure to empty.

Drain completely.

Keep barrel moist—shrinkage may cause leaks.

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Cylinders

Keep cylinder out of sun and away from heat.

Never drop cylinders.

Always keep cylinders secured to prevent falling and/or movement.

Be sure connections are tight.

DOT Regulations prohibit refilling cylinder without permission of owner.

Have air-line respirator or self-contained oxygen respirator available for emergency.

Do not expose cylinder to direct sunlight for long periods of time.

Never apply direct heat to cylinders and/or fittings.

Always replace valve protection device before returning cylinders.

Plastic Containers With and Without Overpacks (For Liquids and Semi-Liquids)

Keep closure up to prevent leakage.

Keep container out of sun and away from heat.

Do not drop or slide across sharp projections.

Never use pressure to empty; container is not a pressure vessel.

Keep lights, fire, and sparks away from container.

Container must not be washed out or used for other purposes.

Replace closure after each withdrawal.

Thoroughly drain containers and tighten closure before returning.

Do not use container as dilution or mixing vessel.

Remove closure carefully to relieve possible internal pressure.

Fiber Drums

Protect from direct contact with water or excessive moisture.

Do not drop onto, or slide across sharp objects.

Do not store on side.

Avoid creasing and/or impacting of side walls.

Shipping Sacks

Protect from direct contact with water or excessive moisture.

Only those bags marked "May be used for open storage" should be so used. Never store on ground.

Keep out of sun and away from heat.

Do not drop or slide across sharp projections.

In case of puncture, use overslip bag and securely close.

MONS 095897

Aerosol Containers

The term "aerosol container" is generally applied to a container which holds its contents under pressure and is equipped with a dispensing nozzle designed to release the container's contents through a very small orifice. This type of container requires more care in handling and storage than similar unpressurized containers and requires protection from elevated temperatures. When the contents are released as an aerosol or fine spray, there may be greater flammability or inhalation hazard than would be presented by the same product in other types of packaging and use.

The following is a recommended precautionary text for the *pressure* hazard presented by a metal aerosol container:

WARNING! CONTENTS UNDER PRESSURE

Do not puncture or incinerate container.

Do not expose to heat or store at temperatures above 120°F.

Appropriate modification of the above text or additional precautionary labeling may be needed to warn against hazards presented by the contents of an aerosol container after release.

SPECIAL PROBLEMS IN PRECAUTIONARY LABELING

Labels for Small Commercial Packages

Small containers may present a problem in that less space is available for labeling purposes. Careful and selective shortening of precautionary statements for such containers may be in order if necessary to permit legibility, or if the wording on labels for the chemical in industrial packages is not applicable. These may include, among others, hazardous substances in retail packages intended for the ultimate consumer; highly purified chemicals intended for research, education, testing, or control; and chemicals intended for professional use. Consideration should always be given to (1) the intended or reasonably foreseeable handling or use of the product, (2) the training and experience of the expected user, and (3) the extent to which the hazard is modified by the size or type of container.

The following principles are recommended for condensation of suggested label wording where necessary or advisable:

1. Retain the Signal Word.

2. Retain the Statement of Hazards, shortened if possible to a practical equivalent.

3. Consider omission of Precautionary Measures if they are clearly indicated or implied from the Statement of Hazards or can be clearly indicated or implied by revising the Statement of Hazards.

4. Consider omission of wording relating to hazards that may be less serious because of the particular characteristics of the package, the nature of the use, and the training and experience of the user.

Care should be taken to see that labels prepared in accordance with the above principles include all information required by law.

Labels for Samples

In general, the label for samples of a product should bear the same precautionary information that is on the commercial label, with the exception of possible differences in container instructions. If the product is not in commercial production, the label for samples should be prepared in accordance with the General Principles and instructions given earlier.

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Labels for New Products for Investigational Use

Chemical, physical, and toxicological data should be obtained on any product before it is distributed, so that the hazardous properties, if any, can be described on the label. However, it may occasionally be necessary to make delivery of a new product for investigational use before all of these data are obtained. For example, the quantity available may be too small for the necessary tests, or the product may have to be delivered to investigators for the purpose of obtaining the desired information. These deliveries should be made to qualified investigators only, and should be labeled as adequately as possible with the information available. To cover such cases (and such cases only), the following illustration is suggested for preparing labels to be used during the period of investigation.

.....

(NAME OR DESCRIPTION OF PRODUCT)

FOR INVESTIGATIONAL USE ONLY

SIGNAL WORD!

STATEMENT(S) OF KNOWN HAZARD(S)

Appropriate precautionary measures.

Appropriate instructions in case of contact or exposure.

IMPORTANT! The chemical, physical, and toxicological properties of this product have not been fully investigated, and its handling or use may (be hazardous) (present additional hazards).

Exercise due care.

.....

(NAME AND ADDRESS OF SOURCE)

Notes

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*The first aid statement for ingestion is subject to change. One of the following statements may be approved prior to label printing:

For ag Labels

EPA

IF SWALLOWED, drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger or blunt object. Do not induce vomiting or give anything by mouth to an unconscious person. Get medical attention.

MCA

Industrial Labels GB 1/PD Reform

IF SWALLOWED, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Call a physician. Never give anything by mouth to an unconscious person.

MONS 095902


MONS 095903