

HAZARD COMMUNICATION Right-To-Know

References:

Title 29, Code of Federal Regulations (CFR) 1910.1200
Marine Corps Order P5100.8F, *Safety & Health Plan*
Base Order 5100.14, *Hazard Communication Program*

The purpose of the standard is to ensure that chemical hazards in the workplace are identified and evaluated and that information concerning these hazards are communicated to employers and employees. This transfer of information is to be accomplished by means of a comprehensive hazard communication program, which includes container labeling and other forms of warning, Material Safety Data Sheets (MSDS) and employee training.

The standard is comprised of six major categories:

1. Hazard Determination
2. Material Safety Data Sheets
3. Chemical Labeling
4. Employee Training
5. The Written Program
6. Trade Secrets.

1. The first category, **Hazard Determination** (29 CFR 1910.1200 (d)) requires employers to identify and evaluate all chemicals used in the workplace. This evaluation is based on two hazard categories: listed and defined. The Industrial Hygiene Office, located in the Medical Clinic, conducts surveys to determine hazards associated with the chemicals used in your area on an annual basis. Their phone number is 639-5986 ext. 24.

Listed hazards are those included in one of the following references: OSHA 29 CFR 1910.1000 Z tables; American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV); the National Toxicology Program; or the International Agency for Research on Cancer.

Defined hazards are those specified by OSHA as physical or health hazards, such as combustible liquids, oxidizers, corrosives, reproductive toxins and non-toxins.

Chemicals exempt from the standard include: wood and wood products (except wood dust), regulated hazardous waste, tobacco products, food, drugs, cosmetics, alcoholic beverages, agricultural or vegetable seed treated with pesticides, various types of pesticides, nuisance particulate, and articles. These are exempt because they are all regulated by separate government standards.

Each organization with hazardous material has a binder containing Base Order 5090.3 *HAZARDOUS MATERIAL MANAGEMENT PROGRAM*, an Authorized Use List and current copies of Material Safety Data Sheets by National Stock Number and Manufacturer. No

Hazardous Material may be brought on this installation without the prior authorization of the Hazardous Material Management Cell. Supervisors will show you where this book is kept and how to interpret Material Safety Data Sheets.

[See attachment 1 for an example of an “Authorized Use List”](#)

2. The second major category of the standard is the **Material Safety Data Sheet (MSDS)** (29 CFR 1910.1200(g)). Once you have evaluated and identified all of the hazardous chemicals in your workplace, you must document them and obtain an MSDS for each item. You need to have an MSDS for each chemical by manufacturer. MSDS are available from the chemical supplier or manufacturer. These sheets contain specific chemical hazard information such as: physical hazards, health hazards, routes of entry, exposure limits (if any), precautions for safe handling and use (if known), spill clean-up procedures, personal protective equipment to be used, emergency and first aid procedures, and the name, address and telephone number of the chemical manufacturer. All of the information on the MSDS must be in English and be available to employees working with or near the hazardous chemical. Current Material Safety Data Sheets may be obtained from the Hazardous Material Management Cell in Building 1260 phone number 639-5810.

[See attachment 2 for “HOW TO UNDERSTAND MATERIAL SAFETY DATA SHEETS”](#)

3. The third category, **Chemical Labeling**, (29 CFR 1910.1200(f)) requires labels on all chemicals in the workplace. The label should contain the identity of the material, appropriate hazard warnings and the name and address of the manufacturer, importer or other responsible party. Other appropriate warning information (such as pictures and symbols) may be used in conjunction with the hazard information. Labels must be legible and in English.

Labels do not always have to adhere to a container. Labels, placards, batch tickets or signs can be placed on shelving or posted where similar stationary containers are stored. No labels are required on portable transfer containers of ten gallons or less, as long as the chemical is used, discarded, or returned to the labeled mother container by the end of the work shift. [29 CFR 1910.1200(f)(7)] Although it is not required, labeling of transfer containers for safety and liability reasons is suggested. Most containers will have the manufacture label affixed to the product and should be easily understood. There are four other types of labels that may be used on this installation, the most common one will be the locally produced *Hazardous Chemical Warning Label*, you may also find some chemicals with the DD Form 2522, *Hazardous Chemical Warning Label*. An example of the locally produced form and the DD Form 2522 label is found in attachments 3 and 4 and reading them is pretty well self-explanatory. Examples of the two other labels and the explanations on how to read them found in attachments 5 and 6 of this handout.

[See attachment 3 for an example of a locally used HAZARDOUS CHEMICAL WARNING LABEL](#)

[See attachment 4 for an example of a DD Form 2522 HAZARDOUS CHEMICAL WARNING LABEL](#)

[See attachment 5 for an example of a HMIS CHEMICAL HAZARD LABELS](#)

[See attachment 6 for an example of a NFPA CHEMICAL HAZARD LABELS](#)

4. The fourth category, **Employee Training** (29 CFR 1910.1200(h)) requires employers to provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment and whenever a new physical or health hazard is introduced into the area. The training shall include: methods and observations used to detect the presence or release of the chemical, physical and health hazards, protective measures, labeling and explanation of the MSDS.

5. The fifth category is **The Written Program** (29 CFR 1910.1200(e)). It requires employers to fully document the actions taken to comply with all of the provision of the standard and to list the responsible person(s) for each area of the program. The installations "Written Program" is Base Order 5100.14, *Hazard Communication Program*. A copy of the written program is available, upon request, to all employees and OSHA officials. Contact your supervisor or Safety Representative for a copy. This order can also be found on the WEB.

6. The sixth and final category of Hazard Communication involves manufacturer **Trade Secrets** (29 CFR 1910.1200(i)). The chemical manufacturer may withhold the chemical identity, including the chemical name and other specific information, from the MSDS. However, under special conditions, health care professionals may obtain this secret information.

AUTHORIZATION USE LIST
ZO01B B1221 MSDS & AUL JAN. 21,2004
HDSC/DDAG
POC John Doe 639-XXXX

NSN	NOUN	MFG
1 *6505-00-205-6513	70% ISOPROPYL ALCOHOL 16 OZ BT	CENTY.\$KINGSWOOD
2 *6810-00-286-5435	99% ISOPROPYL ALCOHOL 1 GL CN	PHARMCO PROD., INC.
3 *6840-01-A07-8567	93 WASP&HORNET SPRAY 17 OZ CN	BENGAL CHEM., INC.
4 *6840-01-A13-3028	DEEPWOOD INSECT REPELLANT 6 OZ CN	S. C. JOHNSON & SON
5 *6850-01-A04-4426	PB'LASTER LUBRICANT 12 OZ CN	W.K. WESTLEY CO.
6 *6850-01-A04-4427	LPS1 GREASELESS LUBE 11 OZ CN	LPS LABORATORIES
7 *6850-01-A04-4434	DEGREASER SOLVENT 18 OZ CN	S&S CO. OF GEORGIA
8 *7510-00-183-7698	33538 STENCIL INK YELLOW 10.5 OZ CN	LHB INDUSTRIES
9 *7510-00-469-7910	37038 STENCIL INK BLK. 1 PT CN	LHB INDUSTRIES
10 *7510-00-469-7910	STENCIL INK BLK. 13 OZ CN	IDEAL STENCIL MFG.
11 *7510-01-A08-1341	STENCIL INK BLK. QT CN	MARSH COMPANY
12 *7510-01-A14-3257	20891 STENCIL INK RED GL CN	MARSH COMPANY
13 *7930-00-357-7386	DETERG. GENERAL PURP 22 OZ BT	LHB INDUSTRIES
14 *7930-00-664-6910	GLASS CLEANER 8 OZ BT	LHB INDUSTRIES
15 *8010-00-067-5434	30109 SO SURE PRIMER BROWN PT CN	LHB INDUSTRIES
16 *8010-00-077-0719	102-1153 WOOD VARNISH 1 GL CN	SHERWIN-WILLIAMS
17 *8010-00-079-3760	11136 ENAMEL RED 10.5 OZ CN	LHB INDUSTRIES
18 *8010-00-527-2045	13538 ENAMEL GLOSS YELL 1 GL CN	NILES CHEMICAL
19 *8010-00-527-2050	17038 ENAMEL GLOSS BLK 1 GL CN	PRA TT&LAMBERT
20 *8010-00-582-4743	PAINT OBLITERATING 10.5 OZ CN	LHB INDUSTRIES
21 *8010-00-582-5382	37038 PAINT BLK 1 PT CN	LHB INDUSTRIES
22 *8010-00-584-3149	14064 OLIVE GREEN 10.25 OZ CN	LHB INDUSTRIES
23 *8010-00-584-3150	37875 FLAT WHITE 10.0 OZ CN	LHB INDUSTRIES
24 *8010-00-721-9743	11105RED PAINT 10.0 OZ CN	LHB INDUSTRIES
25 *8010-00-721-9744	13538 PAINT YELLOW 10.5 OZ CN	LHB INDUSTRIES
26 *8010-01-A05-9395	497 POLYURETHANE FINISH 11 OZ CN	BENJAMIN MOORE
27 *8010-01-331-6105	17875 ECO SURE WHITE 1 PT CN	LHB INDUSTRIES
28 *8010-01-331-6108	37038 ECO SURE BLACK 1 PT CN	LHB INDUSTRIES
29 *8010-01-331-6110	11105 ECO SURE RED 1PTCN	LHB INDUSTRIES
30 *8010-01-331-6111	14064 ECO SURE GREEN 1 PT CN	LHB INDUSTRIES
31 *8010-01-331-6115	13538 ECO SURE YELLOW 1 PT CN	LHB INDUSTRIES
32 *8010-01-A07-5305	A48V200 WOOD OIL STAIN 1 GL CN	SHERWIN-WILLIAMS
33 *8030-00-118-0666	RUST PREVENTATIVE 11 OZ CN	VALVOLINE CO.
34 *8030-00-118-0666	502 TECTYL RUST PREV. 11 OZ CN	F&L COMPANY
35 *8030-00-555-2878	1010 WATER SEAL 1 GL CN	THE THOMPSON'S CO.
36 *8030-01-A03-6534	08664 SUPER SILICONE SEAL.10.3OZTU	3M COMPANY
37 *8030-01-A13-9596	737 DOW CORN.SEAL.CLEAR.10.1OZTU	DOW CORNING
38 *8040-00-142-9193	EC100-28 SUPERGLUE 1 OZ BT	CHEMENCE, INC.
39 *8040-00-938-6860	RUBBER ADHESIVE SPRAY 17 OZ CN	LHB INDUSTRIES
40 *8040-00-938-6860	315-20 HY DUTY ADHES SPRAY 12 OZ CN	AMREP, INC.
41 *8040-01-A07-8668	NON-FLAMMABLE CEMENT GL CN	DAP, INC.
42 *8040-01-A07-8668	TRUBOND CONTACT CEM. 3 OZ BT	DAP, INC.
43 *8040-01-A09-0642	PERM.SILICONE GASK. 3.35 OZ BT	LOCTITE CORP.
44 *9150-00-111-6254	770 ROYCO HYD OIL 1 QT BT	ROYAL LUBRICANTS
45 *9150-00-186-6668	MOTOR OIL SAE 10W 5 GL CN	THE VALVOLINE CO.

FOR INFORMATION CALL
THE HAZMAT CELL AT 639-5810
POC XXXXXXXX

HOW TO UNDERSTAND MATERIAL SAFETY DATA SHEETS

Chemical manufacturers are required by law to supply "Material Safety Data Sheets" (OSHA Form 174 or its equivalent) upon request by their customers. These sheets have nine sections giving a variety of information about the chemical. Following is a section-by-section reproduction and explanation of a Material Safety Data Sheet (MSDS).

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
MATERIAL SAFETY DATA SHEET
Required For compliance with OSHA Act of 1970
Public Law 91-596 (CFR 1910)

SECTION I	
Product Name	Size
Chemical Name	
Formula	
Manufacturer	
Address	
For Information on Health Hazards Call	
For Other Information Call	
Signature and date	

This section gives the name and address of the manufacturer and an emergency phone number where questions about toxicity and chemical hazards can be directed. Large chemical manufacturers have 24-hour hotlines manned by chemical safety professionals who can answer questions regarding spills, leaks, chemical exposure, fire hazard, etc. Other information that may be contained in Section I:

Trade Name: This is the manufacturer's name for the product.

Chemical Name and Synonyms: This refers to the generic or standard names for the chemical.

Chemical Family: This classification allows one to group the substance along with a class of similar substances, such as mineral dusts, acids, caustics, etc. The potential hazards of a substance can sometimes be gauged by experience with other chemicals of that class.

SECTION II - HAZARDOUS INGREDIENTS OF MIXTURES		
Principal Hazardous component(s)	%	TVL (Units)

This section describes the percent composition of the substance, listing chemicals present in the mixture. It lists Threshold Limit Values for the different chemicals that are present.

Threshold Limit values (TLV's) are values for airborne toxic materials that are to be used as guides in the control of health hazards. They represent concentrations to which nearly all workers (workers without special sensitivities) can be exposed to for long periods of time without harmful effect. TLV's are usually expressed as parts per million (ppm), the parts of gas or vapor in each million parts of air. TLV's are also expressed as mg/m³, the milligrams of dust or vapor per cubic meter of air.

SECTION III - PHYSICAL DATA			
Boiling Point (°F)		Specific Gravity (H ₂ O=1)	
Vapor Pressure (mm Hg)		Percent Volatile By Volume (%)	
Vapor Density (Air=1)		Evaporation Rate (Butyl Acetate=1)	
Solubility in Water			
Appearance and Odor			

Vapor Pressure: Vapor pressure (VP) can be used as a measure of how volatile a substance is. That is, how quickly it evaporates. VP is measured in units of millimeters of mercury (mm Hg). For comparison, the VP of water (at 20° Centigrade) is 17.5 mm Hg. The VP of Vaseline (a nonvolatile substance) would be close to zero mm Hg, while the VP of diethyl ether (a very volatile substance) is 440 mm Hg.

Vapor Density: This figure tells whether the vapor is lighter or heavier than air. The density of air is 1.0. A density greater than 1.0 indicates a heavier vapor, a density less than 1.0 indicates a lighter vapor. Vapors heavier than air (gasoline vapor for instance) can flow along just above the ground and can collect in depressions where they may pose a fire and explosion hazard.

Specific Gravity: This figure tells whether the liquid is lighter or heavier than water. Water has a density of 1.0.

Percent Volatile by Volume: Tells how much of the substance will evaporate away.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA			
Flash Point (°F)	Flammable Limits in Air (% by Vol.)	Lower	Upper
Extinguisher Media		Autoignition Temperature (°F)	
Special Fire Fighting Procedures			
Explosion Hazards			

This section gives information, which is important for preventing and extinguishing fires and explosions. If a fire does occur, this information should be made available to fire fighters.

Flash Point: This is the lowest temperature at which a liquid gives off enough vapor to ignite when a source of ignition is present. At or above this temperature, a fire or explosion hazard may exist if the substance is used in the presence of spark or flame.

Flammable Limits: In order to be flammable, a substance must be mixed with a certain amount of air (as in an automobile carburetor). A mixture that is too "lean" (not enough chemical) or too "rich" (not enough air) will not ignite. The Lower Explosive Limit (LEL) and the Upper Explosive Limit (UEL) define the range of concentration in which combustion can occur.

SECTION V - HEALTH HAZARD DATA	
Threshold Limit Value	
Effects of Overexposure	
Acute Overexposure	
Chronic Overexposure	
Emergency and First Aid Procedures	
Inhalation	
Eyes	
Skin	
Ingestion	

This section describes the potential health effects resulting from overexposure to the chemical, and gives emergency and first aid procedures. The symptoms and effects listed are the effects of exposure at hazardous levels: most chemicals are safe in normal use and the vast majority of workers never suffer toxic harm. However, any chemical can be toxic in high concentrations, and the precautions outlined in the MSDS must be followed.

The Health Hazards section often contains information on the toxicity of the substance. The data most often presented are the results of animal experiments. For example, "LD50 (mouse) = 250 mg/kg." The usual measure of toxicity is dose level expressed as weight of chemical per unit body weight of the animal-usually milligrams of chemical per kilogram of body weight (mg/kg). The LD50 or "Lethal Dose Fifty," is the dose of substance that will cause the death of half the experimental animals. The LC50 is the concentration of the substance in air that will cause the death of half the experimental animals.

A rough and somewhat arbitrary classification: when evaluating rodent LD50's, materials with an oral LD50 less than 50 mg/kg are considered highly toxic, and those with an oral LD50 of 50-500 mg/kg are considered moderately toxic.

Health hazard information may also distinguish the effects of acute and chronic exposure. An acute exposure is a single, massive exposure, while chronic exposure is regular exposure to small amounts of a substance over a long period of time.

SECTION VI - REACTIVITY DATA		
Stability	Unstable	Conditions to avoid
	Stable	
Incompatibility (Materials to Avoid)		
Hazardous Decomposition Products		
Hazardous Polymerization		Conditions to Avoid
May Occur	Will Not Occur	

Chemical substances may be hazardous not just in them, but may be hazardous when they decompose (break down into other substances) or when they react with other chemicals.

Stability: Unstable indicates that a chemical can decompose spontaneously under normal temperatures, pressures, and mechanical shocks. Rapid decomposition may be

hazardous because it produces heat and may cause fire or explosion. **Stable** compounds do not decompose under normal conditions.

Incompatibility: Certain chemicals should never be mixed because the mixture creates hazardous conditions. Incompatible chemicals should not be stored together where an accident could cause them to mix.

Hazardous Decomposition Products: Other chemical substances may be created when a chemical burns or decomposes.

Hazardous Polymerization: Some chemicals can undergo a type of chemical reaction (rapid polymerization) which may produce enough heat to cause containers to explode. Conditions to avoid are listed in this section.

SECTION VII - SPILL OR LEAK PROCEDURES	
Steps to be Taken in Case Material is Released or Spilled	
Waste Disposal Method	

SECTION VIII - SPECIAL PROTECTION INFORMATION		
Respiratory Protection (Specify type)		
Ventilation	Local Exhaust	Special
	Mechanical (general)	Other
Protective Gloves	Eye protection	
Other Protective clothing or Equipment		

SECTION IX - SPECIAL PRECAUTIONS	
Precautions to be Taken in Handling and Storing	
Other Precautions	

These sections describe other precautionary and protection information. Some of the precautions presented are intended for large-scale users and may not be necessary for use of small quantities of chemical. Any questions about precautions or health effects should be referred to Environmental Health and Safety.

HAZARDOUS CHEMICAL WARNING LABEL	
Part Number:	Haz Code:
NSN:	MSDS:
Item Name:	
HAZARDS:	Chronic (Delayed):
HEALTH:	
CONTACT:	PROTECT:
FIRE:	
REACTIVITY:	
Specific Hazards & Precautions: (Including Target Organ Effects)	
(See MSDS for further information)	
CONTACT:	
EMERGENCY TELEPHONE NUMBER:	

HAZARDOUS CHEMICAL WARNING LABEL

1. CHEMICAL / COMMON NAME

2. HAZARD CODE

3. NSN / LSN

4. PART NUMBER

5. ITEM NAME

6. HAZARDS (X all that apply)	(1) Acute (Immediate)				(2) Chronic (Delayed)
	NONE	SLIGHT	MODERATE	SEVERE	
a. HEALTH 					
b. CONTACT 					
c. FIRE 					
d. REACTIVITY 					

7. SPECIFIC HAZARDS AND PRECAUTIONS *(Including Target Organ Effects)*

(See MSDS for further information)

8. PROTECT (X all that apply)		a. EYES		b. SKIN		c. RESPIRATORY

9. CONTACT: a. COMPANY NAME

b. ADDRESS *(Street, P.O. Box, City, State, Zip Code and Country)*

c. EMERGENCY TELEPHONE NUMBER *(Include Area Code)*

10. PROCUREMENT YEAR FOR HAZARDOUS CHEMICAL

DD Form 2522, DEC 88

HMIS Chemical Hazard Labels

Definition

The Hazardous Materials Identification System, **HMIS**, was developed by the National Paint & Coatings Association (NPCA) to help employers comply with OSHA's Hazard Communication (HCS), 29 CFR 1910.1200

The system utilizes colored bars, numbers and symbols to convey the hazards of chemicals used in the workplace. See below for an explanation of the system.

Note the following:

- Do not confuse HMIS with WHMIS, which is a set of Canadian Regulations dealing with hazardous materials.
- Do not confuse HMIS labels (colored bars) with NFPA labels (colored diamonds). The two systems are similar but **not** identical. See below for more info.

Further Information

At first glance, the HMIS and NFPA labeling systems appear quite similar. Both have four sections colored blue, red, yellow and white. HMIS uses colored bars, while NFPA uses colored diamonds. HMIS attempts to convey full health warning information to all employees while NFPA is meant primarily for fire fighters and other emergency responders. **Key point: HMIS is not intended for emergency circumstances.**

HMIS labels can appear in a variety of formats. Some will include additional spaces to list target organ effects, a labeling requirement under 29 CFR 1910.1200, and other information, but the four colored areas shown here will always be present.

An older style HMIS label is shown below on the left. In the April 2002 release of HMIS III the yellow Reactivity section was replaced with an orange Physical Hazard section as shown below on the right. Other aspects of the system were also changed (see below).



HMIS Chemical Hazard Labels

Specific sections of an HMIS label include the following:

HEALTH

The Health section conveys the health hazards of the material. In the latest version of HMIS, the **blue Health** bar has two spaces, one for an asterisk and one for a numeric hazard rating.

If present, the asterisk signifies a chronic health hazard, meaning that long-term exposure to the material could cause a health problem such as emphysema or kidney damage. NFPA lacks this important information because the NFPA system is meant only for emergency or acute (short-term) exposures. According to NCPA, the numeric hazard assessment procedure is **different** than that used by NFPA. However, we could find no publicly available information explaining the differences. On a qualitative level, the numbering systems are more or less identical; with a 0 to 4 scale where 0 indicates minimal hazard and 4 indicates an extreme hazard.

FLAMMABILITY

- For HMIS I and II, the criteria used to assign numeric values (0 = low hazard to 4 = high hazard) are identical to those used by NFPA. In other words, in **this** category, the systems are identical.
- For HMIS III, the flammability criteria are defined according to OSHA standards. A 0 to 4 scale is still used.

REACTIVITY

(HMIS I and II - now obsolete)

The criteria used to assign numeric values (0 = low hazard to 4 = high hazard) were identical to those used by NFPA. In other words, in **this** category, the systems are identical. The yellow section has been replaced with an orange section titled **Physical Hazards** - see the next section for more information.

PHYSICAL HAZARD (HMIS III)

Reactivity hazard are assessed using the OSHA criterion of physical hazard. Seven such hazard classes are recognized:

- Water Reactives
- Organic Peroxides

- Explosives
- Compressed gases
- Pyrophoric materials
- Oxidizers
- Unstable Reactives

This version replaces the now-obsolete yellow section titled **Reactivity** - see the previous section for more information. As in the previous sections, the level of hazard is indicated using numeric values (0 = low hazard to 4 = high hazard).

PERSONAL PROTECTION

This is by far the largest area of difference between the NFPA and HMIS systems. In the NFPA system, the white area is used to convey special hazards whereas HMIS uses the white section to indicate what personal protective equipment (PPE) should be used when working with the material.

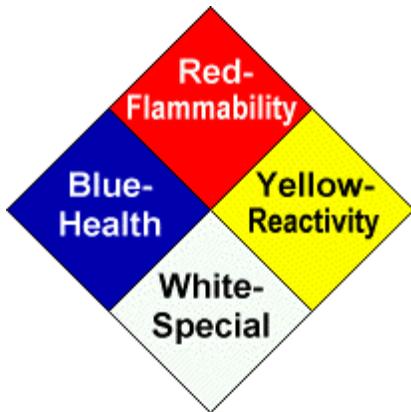
HMIS uses a letter coding system for this section. We at ILPI find this unacceptable because we would rather see the PPE listed explicitly instead of having employees try to remember a bunch of codes or consult a chart, something that could lead to confusion and/or a fatal accident. Likewise, the "custom codes" aspect is particularly dangerous for visitors and contractors who may not remember/recognize that these could vary from job site to job site.

We present the lettering scheme here, along with a series of graphics meant to reinforce the meaning of each letter:

HMIS Letter	Required Equipment
A	 Safety Glasses
B	 Safety Glasses  Gloves
C	 Safety Glasses  Gloves  Protective Apron
D	 Face Shield  Gloves  Protective Apron

D	 Face Shield	 Gloves	 Protective Apron		
E	 Safety Glasses	 Gloves	 Dust Respirator		
F	 Safety Glasses	 Gloves	 Protective Apron	 Dust Respirator	
G	 Safety Glasses	 Gloves	 Vapor Respirator		
H	 Splash Goggles	 Gloves	 Protective Apron	 Vapor Respirator	
I	 Safety Glasses	 Gloves	 Dust Respirator	 Vapor Respirator	
J	 Splash Goggles	 Gloves	 Protective Apron	 Dust Respirator	 Vapor Respirator
K	 Air Line Mask or Hood	 Gloves	 Full Suit	 Boots	

NFPA Chemical Hazard Labels



NFPA Rating - The National Fire Protection Association (NFPA) has developed a system for indicating the health, flammability and reactivity hazards of chemicals. In addition, a special precaution symbol may be used where necessary.

Rating Summary		
Health (Blue)		
4	Danger	May be fatal on short exposure. Specialized protective equipment required
3	Warning	Corrosive or toxic. Avoid skin contact or inhalation
2	Warning	May be harmful if inhaled or absorbed
1	Caution	May be irritating
0		No unusual hazard
Flammability (Red)		
4	Danger	Flammable gas or extremely flammable liquid
3	Warning	Flammable liquid flash point below 100° F
2	Caution	Combustible liquid flash point of 100° to 200° F
1		Combustible if heated
0		Not combustible
Reactivity (Yellow)		
4	Danger	Explosive material at room temperature
3	Danger	May be explosive if shocked, heated under confinement or mixed with water
2	Warning	Unstable or may react violently if mixed with water
1	Caution	May react if heated or mixed with water but not violently
0	Stable	Not reactive when mixed with water
Special Notice Key (White)		
W		Water Reactive
Oxy		Oxidizing Agent