

Color Coding and Signs

I PURPOSE

This standard operating procedure establishes and identifies the use of colors, signs, and signals which should allow for quick recognition of information and hazards in the various work areas.

2 SCOPE

This procedure applies to all functional areas, operations, offices, including employees, vendors, visitors and contractors within the scope of the Integrated Management System (IMS).

3 DEFINITIONS AND ACRONYMS

Definitions

Approved is the requirement for items and/or PPE used in the COMPANY and operations identified as requiring HSLP permission for use and which shall at a minimum meet the requirements of the American National Standards Institute (ANSI) standards, American Society for Testing and Materials (ASTM), or other international or local standards which comply with or exceed those standards and other standards established by the HSLP Department.

Color is the characteristic of visual perception that allows an observer to distinguish the differences in the quality of visual perception caused by the differences in the spectral composition of light.

Fire-Fighting Equipment Signs are signs indicating the location, use and care of fire-fighting equipment such as hydrants, fire extinguishers, fire alarms, etc.

General Rules are rules which apply to all employees, vendors, visitors, and contractors regardless of where they work or what they do.

Information Signs are signs that give a general message about safety devices.

Job Specific is requirements directly associated with a specific job, task, or occupation.

NFPA and HMIS Labels 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.

Obligation Signs are signs indicating the obligatory nature of the message, for example, the use of Personal Protection Equipment.

Overhead Power Transmission Line Information Signs are signs indicating whether or not there is an electric hazard and the maximum height at which overhead power transmission lines are located.

Prohibition Signs are mandatory signs indicating not to do something.

Site refers to any COMPANY location.

Warning Signs are signs indicating the hazards and risks that must be taken into account.

Acronyms

ANSI	American National Standards Institute
DOT	Department of Transportation
ASTM	American Society for Testing and Materials
HMR	HSLP Management Representative
HSLP	Health, Safety and Loss Prevention
IMS	Integrated Management System
ISEA	International Safety Equipment Association
MSDS	Material Safety Data Sheets
NFPA	National Fire Protection Association
PPE	Personal Protective Equipment

4 ROLES AND RESPONSIBILITIES

Document Owner

HMR

Responsible Roles and Position-Holders

Contractors/Vendors are businesses performing a service for the COMPANY. They are responsible for ensuring their employees working on COMPANY sites have the required locks and tags as specified in this procedure and that their employees understand and comply with the requirements as outlined in this procedure.

Employees and Contracted Employees are employees in any position whether COMPANY or contracted employees working on any COMPANY site. They are responsible for complying with the requirements as outlined in this procedure and be familiar with the hazards associated with compressed gases.

General Foreman can be a COMPANY employee or a contractor/vendor working or traveling on any COMPANY site. They are required to approve the Color Coding & Signs and ensure it is correctly completed, inspect the work area prior to work commencing, and ensure the necessary resources exist and are in place before any of the work is performed.

HSLP is any COMPANY employee working under and including the Regional Director of HSLP. They are responsible for establishing the minimum requirements for compressed gases safety and periodically auditing for compliance to this procedure.

Supervisor/Foreman or Designee can be a COMPANY employee or a contractor/vendor working or traveling on any COMPANY site. They are responsible for training employees to this procedure and for enforcement of all requirements, rules, and established guidelines as outlined in this procedure.

5 DIRECTION

All employees, vendors, contractors, and visitors traveling/working on site shall comply with and ensure personnel accountable to them comply with the following requirements of this procedure.

Supervisors

Ensure that they and all workers under their responsibility are trained and know the meaning of the colors and signs in their respective areas.

Be responsible for the strict compliance with this standard in their work areas.

Workers

Follow guidelines of this standard.

Do not damage signs and comply with the messages contained in them.

Guidelines

Safety signs must be color coded as established in this standard.

Safety signs must be posted in strategic spots and must be visible both day and night.

Safety signs must be made of weather resistant materials.

Safety signs must be kept clean and in good condition. In the event of wear and/or discoloration, signs must be removed and replaced immediately.

Signs must be posted at prominent and strategic places.

Workplace hazards

Work place hazards need to be marked to alert employees to the dangers that exist in a facility or area. Depending on the specific workplace situation, different regulations may apply. The Mine Safety and Health Administration (MSHA) requirements are often non-specific with regard to size, color and wording of markings. To provide uniformity, the American National Standards Institute (ANSI) has designed color schemes and sizes for marking hazards. The color code identifies the type of hazard, which helps the employee identify the level of severity. It is meant to reduce the possibility of injuries. In areas where MSHA does not cite specific requirements, the ANSI standard should be followed. The following chart represents the color codes of ANSI.

BACKGROUND COLOR	MEANING	APPLICATION
Red	Danger	Safety cans and signs.
	Stop	Emergency stop bar or button on machinery. Identification of fire equipment.
Fluorescent Orange, Orange-Red	Biosafety	Labels and containers for blood and infectious waste. (Warning labels must be fluorescent orange or orange-red with the biosafety symbol in a contrasting color.)
Yellow	Caution	Tripping, falling and striking hazards. “Flammable, Keep Fire Away” labels on cabinets. Safety cans, containers for explosives, corrosives or unstable materials.
Orange	Warning	Parts of machinery or energized equipment that may cut crush or otherwise injure. Inside of transmission guards for pulleys, gears, etc.
Green	Safety	Location of first aid equipment. Location of safety equipment; respirators, safety showers, etc.
Blue	Information	Signs, bulletin boards. Specific railroad warnings against starting, using or moving equipment being repaired.
Black, White, Yellow or Combination of Black with White or Yellow	Boundaries	Traffic or housekeeping markings. Stairways, directions and borders.
Magenta or Purple on Yellow	Radiation Caution	X-ray, alpha, beta, gamma, neutron and proton radiation.

Labels and Other Forms of Warning

Labels must be prominently displayed and legible. Missing or unreadable labels must be replaced immediately.

Containers containing hazardous chemicals must be labeled to include the following information:

- a** Identity of the hazardous chemical(s), which would permit cross-referencing between the inventory list and the MSDS.
- b** Appropriate hazard warning.
- c** Required PPE.

Label Requirements

HMIS labeling system is intended to be used by employers and workers on a daily basis and provides information on acute and chronic health hazards, flammability, physical hazard, and personal protective equipment. The system helps the COMPANY comply with MSHA's Hazard Communication Standard. HMIS emphasizes the use of personal protective equipment and hazard communication and shall be used for labeling of daily use containers that do not have adequate labeling.

NFPA's labeling system is intended for use by emergency response personnel (fire fighters, hazardous materials workers, police, etc.) under emergency conditions. Labels contain information on acute health hazards, flammability, physical hazard and special characteristics that may require special fire fighting techniques, such as reactivity with water. NFPA should be used for the labeling of buildings, bulk storage, tanks, bins, silos, etc.

Secondary Container Labeling

If an employee transfers a hazardous chemical to another container, the individual performing the transfer shall ensure that the secondary container is marked with the appropriate labeling information.

Labeling Requirements for Labs

Labs must comply with their respective Lab Labeling Requirements, and at minimum must ensure that the workers using hazardous chemicals:

- a** Know the identity of the chemical, its hazards, any protective measures needed.
- b** Leave the container empty at the end of the shift or ensure that it is properly labeled.

Bulk Storage Tanks, Bins, and Silos

Labeling of Bulk Storage Tanks, Bins, Silos, etc. should comply with NFPA 704 Standard System for the Identification of the Fire Hazards of Materials, which includes the NFPA diamond (see below) AND the chemical name.



HEALTH HAZARD	
4	Very short exposure could cause death or serious residual injury even though prompt medical attention was given.
3	Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.
2	Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
1	Exposure could cause irritation but only minor residual injury even if no treatment is given.
0	Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.



FLAMMABILITY	
4	Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.
3	Liquids and solids that can be ignited under almost all ambient conditions.
2	Must be moderately heated or exposed to relatively high temperature before ignition can occur.
1	Must be preheated before ignition can occur.
0	Materials that will not burn.







INSTABILITY	
4	Readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures.
3	Capable of detonation or explosive reaction, but requires a strong initiating source or must be heated under confinement before initiation, or reacts explosively with water.
2	Normally unstable and readily undergo violent decomposition but do not detonate. Also: may react violently with water or may form potentially explosive mixtures with water.
1	Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.
0	Normally stable, even under fire exposure conditions, and are not reactive with water.



SPECIAL HAZARDS	
This section is used to denote special hazards. There are only two NFPA 704 approved symbols:	
OX	This denotes an oxidizer, a chemical which can greatly increase the rate of combustion/fire.
W	Unusual reactivity with water. This indicates a potential hazard using water to fight a fire involving this material.

Other symbols, abbreviations, and words that some organizations use in the white Special Hazards section are shown below.

These uses are not compliant with NFPA 704, they are presented here in case you see them on an MSDS or container label:

ACID	This denotes an oxidizer, a chemical which can greatly increase the rate of combustion/fire.
ALK	This denotes an alkaline material, also called a base. These caustic materials have a pH greater than 7.0
COR	This denotes a material that is corrosive (it could be either an acid or a base).
	This is another symbol used for corrosive.
	The skull and crossbones are used to denote a poison or highly toxic material. See also: CHIP Danger symbols.
	The international symbol for radioactivity is used to denote radioactive hazards; radioactive materials are extremely hazardous when inhaled.
	Indicates an explosive material. This symbol is somewhat redundant

HMIS PPE Codes

- a** Safety Glasses
- b** Safety Glasses and Gloves
- c** Safety Glasses, Gloves and an Apron
- d** Face Shield, Gloves and an Apron
- e** Safety Glasses, Gloves and a Dust Respirator
- f** Safety Glasses, Gloves, an Apron, and a Dust Respirator
- g** Safety Glasses and a Vapor Respirator
- h** Splash Goggles, Gloves, an Apron, and a Vapor Respirator
- i** Safety Glasses, Gloves and a Dust/Vapor Respirator
- j** Splash Goggles, Gloves, an Apron, and a Dust/Vapor Respirator
- k** Airline Hood or Mask, Gloves, Full Suit and Boots
- l – z** Custom PPE Specified By Employer

Pipe Markings

Unmarked pipes mean danger – to both life and property. Numerous injuries have occurred through ignorance of pipe contents, particularly when outside agencies are called in under emergency conditions. Pipes shall be marked with a Legend. This Procedure considers legend to be primary and explicit for identification of contents.

Positive identification of the contents of a piping system shall be by lettered legend giving the name of the contents in full or abbreviated form.

Arrows shall be used to indicate direction of flow.

Contents shall be identified by legend with sufficient additional details such as temperature, pressure, etc. as are necessary to identify the hazard.

Legend shall be brief, informative, pointed, and simple for greatest effectiveness.

CLASSIFICATION	SUB CLASSIFICATION	COLOR SCHEME
Materials Inherently Hazardous	Flammable, explosive, chemically active, toxic, extreme temperature/pressure, radioactive	Black on Yellow
Materials of Inherently Low Hazard	Liquid or liquid mixture	White on Green
	Gas or gaseous mixture	White on Blue
Fire Quenching Materials	Water, foam, Carbon Dioxide, Halon, etc.	White on Red

SIZE OF LEGEND LETTERS AND LENGTH OF COLOR FIELD FOR PIPING					
Outside Diameter of Pipe or Covering		Length of Color Field		Letter Height	
Inches	mm	Inches	mm	Inches	mm
3/4 to 1-1/4	19 to 32	8	200	1/2	13
1-1/2 to 2	38 to 51	8	200	3/4	19
2-1/2 to 6	64 to 150	12	300	1-1/4	32
8 to 10	200 to 250	24	600	2-1/2	64
over 10	over 250	32	800	3-1/2	89

Compressed Gas Cylinders

Compressed gas cylinders shall be legibly marked for the purpose of identifying the gas content with either the chemical or the trade name of the gas. Such marking shall be by means of stenciling, stamping, or labeling, and shall not be readily removable. Whenever practical, the marking shall be located on the shoulder of the cylinder.

- a** A durable label shall be provided that cannot be removed from the compressed gas cylinder.
- b** Compressed gas cylinders that do not clearly identify its contents by name shall not be accepted for use.
- c** Color-coding is not a reliable means of identification; cylinder colors vary from supplier to supplier, and labels on caps have no value because many caps are interchangeable.
- d** If the labeling on the gas cylinder becomes unclear or defaced so that the contents cannot be identified, the cylinder shall be marked "contents unknown" and the manufacturer must be contacted regarding appropriate procedures for removal.

Colors to be Used in Safety Tapes

Red safety tape, means danger keep out. When used, signs or tags shall be posted to warn of the danger and employees shall be instructed of the immediate danger and what special precautions are necessary. Only authorized personnel may enter these areas.

Yellow safety tape. Means caution possible hazard. Signs or tags shall be posted to warn of potential hazard and employees shall be instructed of the possible hazard and what precaution should be taken. Only authorized personnel may enter these areas.

The use of safety tape to mark hazards shall be temporary. If the hazard is permanent or may exist for an extended amount of time, solid barricades which prevent crossing or solid barricades with signage to warn of the hazard shall be installed.

Warning Lights and Alarms

Warning devices such as lights and audible alarms must be installed where they are needed to warn personnel against remaining in or entering hazardous areas. Personnel must receive instructions from their supervisor, about the meaning and the response required when an alarm sounds.

Lights alone do not suffice as adequate warning, a sign describing the hazard and action to take must be posted near the warning light. Table 1 lists warning devices and their appropriate uses. Green lights are only needed where applicable.

WARNING	MEANING	ACTION
Red light	Danger	Do not enter; Do not enter without permission, Evacuate the area
Yellow light	Caution	Limited access; Warn personnel of potential hazard
Green light	Safe	No hazard; No entry restrictions
Sirens, horns, bells, buzzers, etc.	Warning; Hazardous condition exists	Be on alert; Follow directions

Light vehicles require buggy whips, which extend 3 feet above the roof line and flashing lights on roofs when driving on active mining roads and areas.

- a The color of roof lights shall be green/yellow.

Department of Transportation Placarding

The DOT has broad authority to regulate hazardous materials that are in transport, including the discretion to determine which materials shall be classified as “hazardous”. These materials are placed in one of nine categories, based on their chemical and physical properties. Based on the classification of the material, the DOT is also responsible for determining the appropriate packaging materials for shipping or transport. Also based on the material classification, strict guidelines are furnished for proper labeling/marketing of packages of hazardous materials offered for transport, and for placarding of transport vehicles.

Class 1: Explosives

- a Division 1.1 Explosives with a mass explosive hazard
- b Division 1.2 Explosives with a projection hazard
- c Division 1.3 Explosives with predominantly a fire hazard
- d Division 1.4 Explosives with no significant blast hazard
- e Division 1.5 Very Insensitive Explosives
- f Division 1.6 Extremely Insensitive Explosive Articles



Class 2: Gases

- a Division 2.1 Flammable Gases
- b Division 2.2 Nonflammable Gases
- c Division 2.3 Poison Gas
- d Division 2.4 Corrosive Gases



Class 3: Flammable Liquids

- a Division 3.1 Flashpoint below -18oC (0oF)
- b Division 3.2 Flashpoint -18oC and above, but less than 23 oC (73oF)
- c Division 3.3 Flashpoint 23oC and up to 61oC (141oF)



Class 4: Flammable Solids, Spontaneously Combustible Materials, and Materials that are dangerous when wet.

- a Division 4.1 Flammable Solids
- b Division 4.2 Spontaneously Combustible Materials
- c Division 4.3 Materials That Are Dangerous when wet



Class 5: Oxidizers and Organic Peroxides

- a Division 5.1 Oxidizers
- b Division 5.2 Organic Peroxides



Class 6: Poisons and Etiologic Materials

- a Division 6.1 Poisonous Materials
- b Division 6.2 Etiological (Infectious) Materials



Class 7: Radioactive Materials

- a Any material, or combination of materials, that spontaneously gives off ionizing radiation. It has a specific activity greater than 0.002 microcuries per gram.



Class 8: Corrosives

- a A material, liquid or solid, that causes visible destruction or irreversible alteration to human skin or a liquid that has a severe corrosion rate on steel or aluminum.



Class 9: Miscellaneous

- a A material which presents a hazard during transport, but which is not included in any other hazard class (such as a hazardous substance or a hazardous waste).



Additional Labeling and Signage

Confined Spaces - A workplace containing confined spaces must be identified by danger signs or other effective means of identifying the existing confined spaces, their locations and the dangers they pose.

Exits - Signs must identify exit locations. "EXIT" with an arrow showing the direction of the nearest exit must be placed in locations where an exit is not immediately observable. Doors and passageways that are not exits must also be marked.

Eyewash/Shower Stations - The locations of eyewashes and showers must be identified.

Hazardous Waste - Facilities accumulating hazardous waste on site must label containers as "Hazardous Waste" and include the accumulation start date. Containers that are transported must be labeled in accordance with the Department of Transportation.

High Voltage - Outside covers for pull and junction boxes must be permanently marked "High Voltage." Overhead power lines that cross road ways should have warning signs to identify the hazard.

Lockout/Tagout - Lockout and tagout devices need to be standardized in terms of size, color, shape, print and format. Tagout devices also need to warn against hazardous conditions if equipment is energized. Appropriate legends on the tagout devices include: Do Not Start, Do Not Open, Do Not Operate, Do Not Close, and Do Not Energize.

Permanent Aisles and Passageways - Sufficient clearances need to be allowed for mechanical equipment handling, loading docks and doorways. To keep these areas clear, passageways must be clearly marked or warn of hazards.

Portable Fire Extinguishers - Fire extinguishers need to be mounted and identified so they are readily accessible to employees.

Radiation Hazards - Radiation areas and containers of radioactive material are posted or labeled with signs bearing the radiation caution symbol. These signs or labels require specific wording depending on the situation.