Pipe and Valve Identification

Pipe Markers are a critical part of the visual safety system

Almost every industrial and commercial piping system contains hazardous fluids and gases, and their release can cause potential severe personal injury or property damage. Clarion supplies a full line of pipe markers, arrows and arrow banding tape, and underground marking tape.

A13.1–1996 Color Requirements	
Black On Yellow **Intrinsically Hazardous** • Chemically active • Toxic • Radioactive • High pressure / temperature • Explosive or flammable	**White On Blue** **Low Intrinsic Hazardous Gas** • Pure gas • Gaseous admixture • Gases not used for fire arresting
White On Red **Fire Arresting Material** • Water • Foam • CO_2 • Halon	**White On Green** **Low Intrinsic Hazard Liquid** • Pure liquid • Liquid admixture • Water if not used for fire arresting

A13.1–2007 Color Requirements	
Fire Quenching Fluids	Red Background / White Legend
Toxic & Corrosive Fluids	Orange Background / Black Legend
Flammable Fluids	Yellow Background / Black Legend
Combustible Fluids	Brown Background /White Legend
Potable, Cooling, Boiler Feed, & other Water	Green Background / White Legend
Compressed Air	Blue Background / White Legend

ASME/ANSI A13.1: One standard, two versions

The key standard regarding pipe marking is **ASME/ANSI A13.1**. This standard uses the **ANSI Z535.1 Standard for Safety Colors** to specify the proper color coding of pipe markers. **ASME/ANSI A13.1**defines:

- The size of the letters for each diameter of pipe
- The length of the color field
- Installation location recommendations
- The distance between markers
- Requirements for the use of direction of flow arrows

There are two versions of the **ASME A13.1** standard in use today, the **1996** version and the **2007** version. Clarion carries the colors and legends suitable to match either version of the standard you choose to use. The key differences between the two versions are as follows:

1996 version

- High-pressure or high-temperature substances, such as boiler water, use black letters on a yellow background
- Toxic fluids use black letters on a yellow background

2007 version

- All water applications, such as hot boiler water, use white letters on a green background
- Toxic fluids use black letters on an orange background

ANSI Pipe Marking Standards

Hazardous materials flow through miles of piping in many industrial, commercial and institutional facilities. Just like hazardous materials in other situations, piping systems should be appropriately labeled to make people aware of the hazardous materials they carry. The ANSI A13.1-1981 Scheme for Identification of Piping Systems addresses this concern by offering a common labeling method for use in all facilities.

ANSI separates materials transported in above-ground piping systems into three categories:

- High-Hazard Materials: Encompasses several hazard areas including corrosive and caustic materials; substances that are toxic or capable of creating toxic gases; explosive and flammable materials; radioactive substances; and materials that, if released, would be hazardous due to extreme pressures or temperatures.
- Low-Hazard Materials: Materials that are not inherently hazardous and have a small chance of harming employees through mild temperatures and low pressures.
- Fire Suppression Materials: Fire protection materials such as foam, carbon dioxide (CO_2), Halon and water.

Label Requirements

Pipe marking labels must effectively communicate the contents of the pipes and give additional detail if special hazards (such as extreme temperatures or pressures) exist. The legend should be short in length and easy to understand. For example, the legend "Steam 100 PSIG" specifies the contents as well as the additional pressure hazard. An arrow should be used in conjunction with the legend to show which direction the material flows.

The three hazard classes have different color-coded labels associated with them. All high-hazard materials use black characters on a yellow background. The low-hazard material class is divided into two different color schemes: liquids or liquid mixtures use white characters on a green background; gases or gaseous mixtures use white characters on a blue background. The fire suppression class uses white letters on a red background. The letters on pipe labels should be a minimum of 1/2" high, and should increase in size as the pipe diameter increases. The following table indicates ANSI-recommended letter height for various pipe sizes.

Outside Pipe Diameter Letter Height

.75" to 1.25"	.5"
1.5" to 2"	.75"
2.5" to 6"	1.25"
8" to 10"	2.5"
over 10"	3.5"

Label Placement

Labels should be positioned on the pipes so they can be easily read. Proper label placement is on the lower side of the pipe if the employee has to look up to the pipe, on the upper side of the pipe if the employee has to look down towards the pipe, or directly facing the employee if on the

same level as the pipe (see Illustration 1). Labels should be located near valves, branches, where a change in direction occurs, on entry/re-entry points through walls or floors, and on straight segments with spacing between labels that allows for easy identification (see Illustration 2).

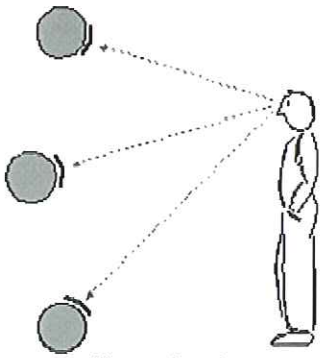

Illustration 1

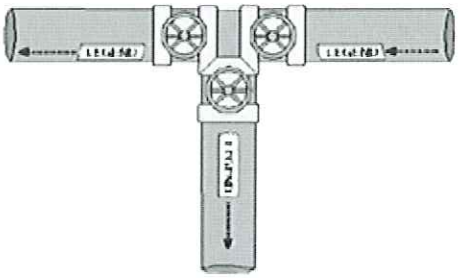

Illustration 2

Exceptions to this Standard

Other pipe labeling systems are acceptable if they are put in writing and meet the basic ANSI requirements.

Commonly Asked Questions

Q. ***Are particular shades of yellow, green, red and blue required for pipe labels?***

A. Yes, ANSI A13.1-1981 recommends the color code featured in the ANSI Z53.1-1979 Safety Color Code for Marking Physical Hazards. This Z53.1 standard, however, has been revised and is now ANSI Z535.1-1991. The color shades recommended are intended to give highest level of recognition to employees with both normal and color-deficient vision.

Q. ***Has this ANSI Standard been adopted by OSHA?***

A. No, it is still considered an industry consensus standard, which is only a recommendation

References

ANSI A13.1-1981 *Scheme for the Identification of Piping Systems*, American National Standards Institute, New York, NY 10036.

ANSI Z53.1-1979 *Safety Color Code for Marking Physical Hazards*, American National Standards Institute, New York, NY 10036.

ANSI Z535.1-1991 *Safety Color Code*, American National Standards Institute, New York, NY 10036.

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