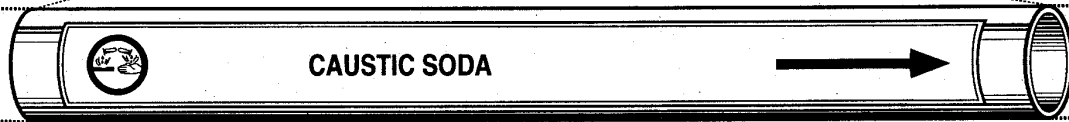


FIXED PIPING SYSTEMS IDENTIFICATION GUIDELINE

EXAMPLES:



A sample section of pipe containing "Liquid Caustic Soda (Sodium Hydroxide)"



WHMIS Symbol(s)

Name

Arrow (direction of flow)

A sample section of pipe containing "Pressurized Chlorine Gas"



WHMIS Symbol(s)

Name

Arrow (direction of flow)

PIPING SYSTEMS

The following information serves as a recommended guideline for the identification of piping systems. It incorporates all legislated requirements contained in the Manitoba Building Code, Manitoba Plumbing Code, Manitoba Fire Code, Propane Installation Code, and CAN/ CGSB-24.3-92 (“Identification of Piping System”), on the identification of controlled products contained within a fixed pipeline or piping system.

Note: This guideline DOES NOT address medical or portable systems. Please refer to the last section in this guideline for general information.

SCOPE

This standard specifies the means for the identification of materials contained in piping systems including pipes buried underground and electrical conduits, by means of background colour marking, legend, and in some cases, pictogram(s). The use of this standard will result in greater safety and awareness by reducing chances of error, simplifying the handling of emergencies, and minimizing hazards to personnel.

This standard does not fully address the needs of individuals who are colour blind or illiterate, and does not purport to address all of the safety aspects associated with its use.

The system(s) utilized for the containment of liquids, gases and solids is categorized as one of the following;

- a) fixed
- b) fixed and portable
- c) portable
- d) medical

The following information outlines **FIXED** pipeline identification.

FIXED PIPING SYSTEMS

Refers to piping systems that are **affixed and not transportable**. The system or container is affixed permanently or attached for an extended period of time.

Please Note: This does include medical systems.

TERMINOLOGY

Controlled Product

Under the WHMIS system, any product, material or substance, which by application of the criteria in Part IV of the Controlled Products Regulations is included in any of the following six classes, is considered to be a controlled product:

- a) compressed gas
- b) flammable and combustible material
- c) oxidizing material
- d) poisonous and infectious material
- e) corrosive material
- f) dangerously reactive

Pipes

Conduits for electrical conductors and for the transport of gas, liquids or solids (or any combination thereof), or as a carrier of solids carried in liquids, or gas or air lines.

Piping Systems

Pipes of any kind (including PVC), their fittings, valves, vessels, other plant equipment, and pipe coverings. Supports, brackets and/or other accessories are specifically excluded from the application of this standard.

TABLE 1: Material Classification and Corresponding Colour Schemes

MATERIAL	BACKGROUND COLOUR*	LEGEND COLOUR
Hazardous	Yellow 505-101	Black 512-101
Low Hazard	Green 503-107	White 513-101
Fire Protection	Red 509-102	White 513-101

* Colour numbers are those in CGSB standard 1-GP-12

Hazardous Materials

Includes controlled products stipulated above.

Includes all electrical conduit, with the exception of control circuits designated as Class 2 circuits or telephone circuits as specified in Section 16 and 60 respectively of the Canadian Electrical Code, Part I.

Includes materials at high temperature or under high pressure. For some materials, temperatures as low as 60 degrees celcius or pressures as low as 275 kPa can be dangerous.

Includes all WHMIS controlled products.

Inherently Low Hazard Materials

Materials which are not hazardous by nature, and eat at ambient pressure and temperature such that people working on systems carrying these materials experience minimal risk through the release of these materials.

This includes control circuits designated as Class 2 circuits or telephone circuits as specified in section 16 and 60 respectively of the Canadian Electrical Code, Part I.

Fire Protection Materials

Sprinkler systems and other piped fire fighting or fire protection equipment. This includes water (for fire fighting), foam, CO₂, Halon and dry chemical systems.

Some fire protection materials may also be hazardous. In such cases, a pictogram should be included on the legend.

GENERAL REQUIREMENTS

The identification of a material or substance contained in a piping system shall include an appropriate legend with proper labeling, pictograms, arrows, and words which indicate the contents of the pipe in a clear and concise manner. The labeling must be clearly visible and readable. See Table 2.

TABLE 2: Height of Legend Letters and numbers

OUTSIDE DIAMETER OF PIPE OR COVERING	HEIGHT OF LETTERS AND NUMBERS
19 to 32 mm	13 mm
38 to 51 mm	19 mm
64 to 150 mm	32 mm
200 to 250 mm	64 mm
over 250 mm	89 mm

IDENTIFICATION BY LEGEND

The material contained in a piping system shall be identified by a legend made of clearly legible letters and/or numbers and/or symbols giving the name or identifier of the material contained within.

All piping systems covered by this guideline **MUST BE LABELLED** to identify its contents.

Piping systems containing the following materials should have the appropriate corresponding words. This is not a comprehensive list:

- High temperature	“HOT”
- High pressure	“PRESSURIZED”
- Containing Steam	“STEAM”
- Electrical Conduit	“ELECTRICAL”
- Liquids	“LIQUIDS”
- Gas	“GAS”
- Abandoned or Unused	“NOT IN USE” or “PREVIOUSLY CONTAINED _____”

Arrows shall be used to indicate the DIRECTION OF FLOW, double arrows being used for reversible flow. The arrows shall be large enough to be readily distinguishable and shall be the same colour as the legend, letters and/or numbers and/or symbols.

Piping systems shall be identified by pictograms, if so applicable, applied adjacent to the legend and the direction of flow arrows. The pictograms shall be identified according to the Workplace Hazardous Materials Information System (WHMIS) symbols (see attached). If necessary, more than one pictogram may be used to identify the controlled product.

VISIBILITY

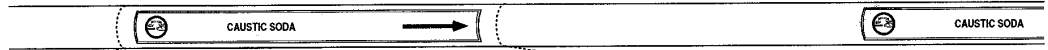
Piping identification labels shall be placed on the piping system in areas where it would be most visible to employees. The label should be repeated every 8-10 feet (3m). When piping systems are located near ceilings or above an employee’s line of sight, identification shall be placed on the bottom of the pipes where clearly visible.

Vessels may require additional labelling when chemical reaction(s) change the material inside the vessel.

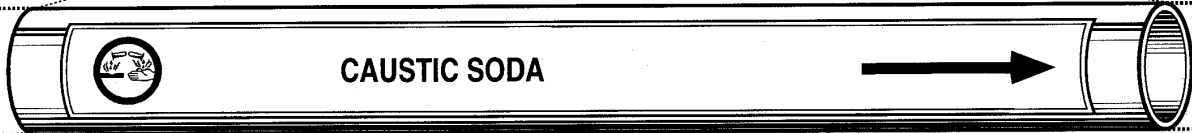
Pipes buried in the ground should be labelled by laying a stretchable polyethylene ribbon above buried pipe. The ribbon shall then be buried. The ribbon shall display the same information as above ground piping systems in intervals not more than 800mm apart.

Figure 1: Example of Piping System Identification

EXAMPLES:



A sample section of pipe containing "Liquid Caustic Soda (Sodium Hydroxide)"

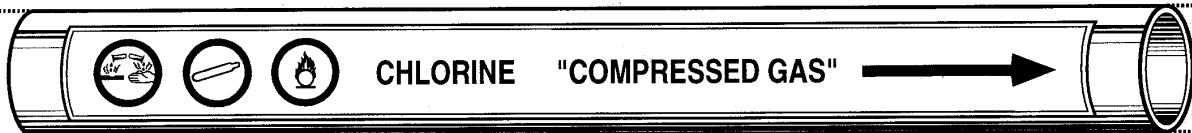


WHMIS Symbol(s)

Name

Arrow (direction of flow)

A sample section of pipe containing "Pressurized Chlorine Gas"



WHMIS Symbol(s)

Name

Arrow (direction of flow)

Figure 2: Examples of Identification of Materials

Material Category	Pipe Colour	Legend	Legend Colour	Pictogram	Pictogram Colour
Hazardous	Yellow	Gasoline Chlorine Ethylene Hydrogen Sulfide Nitrogen (Gas) Carbon Dioxide	Black		Black
Low Hazard	Green	Water (Drinking) Hydraulic Oil Boric Acid	White		White
Fire Protection	Red	Water Halon 1301 Carbon Dioxide	White		White

Fixed and Portable Systems

All affixed components of a piping identification system must conform to the standards established in the Fixed Piping System standard mentioned above. All portable components of the piping system must adhere to both the Provincial and Federal Government regulations concerning the transportation of dangerous goods.

Portable Containers that are stored in the workplace must also meet WHMIS requirements.

PORTABLE CONTAINMENT SYSTEMS

Containment systems that are transportable from one place to another. The transportation of dangerous goods is legislated by both the Province and the federal government. For more information please contact the following:

Province of Manitoba (Highway Transportation)
Dangerous Goods Handling and Transportation Act
(204) 945-7025 –Manitoba Department of The Environment

Federal Government (Air, Marine & Rail Transportation)
Transportation of Dangerous Goods Act
(204) 983-5969 –Government of Canada, Department of Transport

Please Note: The Province of Manitoba adopts the Federal Government's Transportation of Dangerous Goods regulations. The transportation of dangerous goods is not addressed in this guideline.

MEDICAL PIPING SYSTEMS

CAN/CGSB – 24.2-M86 “Identification of Medical Gas Containers, Pipelines and Valves”

CAN/CSA – Z305.1-92 “Identification of Medical Gas Piping Systems”

For a copy of the CAN/CGSB standard please contact:

The Secretary
Canadian General Standards Board
Ottawa, Ontario
K1A 1G6

1-819-965-0425
1-819-965-0426