

BELIZE NATIONAL STANDARD

BZS 1: Part 7: 2012

**BELIZE NATIONAL STANDARD
SPECIFICATION FOR MARKING AND
LABELLING OF GAS CYLINDERS**

(BZS 1: Part 7: 2012)

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BELIZE NATIONAL STANDARD
SPECIFICATION FOR THE MARKING AND LABELLING OF
GAS CYLINDERS

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The preparation of this standard for the Standards Advisory Council established under the Standards Act 1992 (Revised Edition 2000), was carried out under the supervision of the Bureau's Technical Committee for Liquefied Petroleum Gas (LPG), which at the time comprised the following members:

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BELIZE NATIONAL STANDARD
SPECIFICATION FOR THE MARKING AND LABELLING OF
GAS CYLINDERS

0 FOREWORD

- 0.1 Warning labels on cylinders of industrial and domestic gases or gas mixtures provide valuable information pertaining to the identification of each cylinder and its contents and the principal hazards associated with them. Accidents can happen during the handling, transportation, usage and storage of compressed gases – permanent, liquefied or dissolved –and users should become familiar with the internationally recognized warning marks and symbols that give some indication of the properties and inherent hazards of the products they use.
- 0.2 This standard was therefore prepared to provide guidance to users and to ensure their safety when dealing with compressed gases. The standard defines a method of identification which incorporates labelling and marking.
- 0.3 In drafting this standard, considerable assistance was derived from SLNS 47: 2011, Requirements for the Marking and Labelling of Gas Cylinders, Saint Lucia Bureau of Standards.
- 0.4 In preparing this standard, assistance was derived from:
- a) ISO 11625: 1998 Gas cylinders – Safe handling;
 - b) ISO 7225: 1994 Precautionary labels for gas cylinders;
 - c) TTS 21 10 505 Part 1-1980: Industrial and Domestic Gas Cylinders.

1 SCOPE

- 1.1 This standard specifies the requirements for the labelling and marking of industrial and domestic gas cylinders for identification of contents and associated hazards. It covers fixed or portable cylinders intended for the storage or transport of compressed gases.
- 1.2 This standard does not cover:
- a) fire extinguishers or aerosol dispensers and cylinders;
 - b) containers that are pressurized for the purpose of transporting solids or liquids, e.g. cylinders pressurized with air for the transport of cement;

- c) cylinders that form part of the working mechanism of a vehicle e.g. a compressed air tank for a compressed air braking system;
 - d) gas cylinders intended for use on aircraft or sea going vessels (other than barges and fixed or floating platforms used in the petroleum and other industries); and
 - e) medical gas cylinders.
- 1.3 It should not be assumed that every applicable safety precaution is contained in this standard.

2 NORMATIVE REFERENCES

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BZS 1: Part 1: 1998 Specification for labelling: General Principles.

3 DEFINITIONS

For the purpose of this standard, the following definitions shall apply:

- 3.1 **Cylinder** means any metallic vessel or container that is not a pipe or part of a pipe and which is used primarily for the storage and/or transportation of gas or gas mixtures above atmospheric pressure.
- 3.2 **Cylinder band** means a group of cylinders connected through their valves.
- 3.3 **Gas** means any matter in the gaseous or vapour state, liquid/vapour interphase, including a gas dissolved in a solvent under pressure.
- 3.4 **Industrial or Domestic Use** means the use of a gas for industrial or domestic purposes, cooking, heating or for scientific purposes.
- 3.5 **Standard Cubic Meter** means a cubic meter of a gas that is measured at a temperature of 15° C and a pressure of 101.325 kPa (1013.25 m bar).
- 3.6 **Tube Trailer** means a bank of cylinders of minimum length 4.8 m (16 ft) installed horizontally on a truck or trailer.

4 CLASSIFICATION

For the purpose of this standard, gas cylinders shall be classified according to their dimensions as in Table 1.

Table 1 – Dimensional classification of gas cylinders

	External Dimensions	
	Diameter (mm)	Length (Height) (mm)
Type A	500 and less (1.64ft.)	2500 and less (8.2ft.)
Type B	500 and less	more than 2500
Type C	Over 500	Any Length

5 REQUIREMENTS

5.1 *Type A Cylinders*

- 5.1.1 All cylinders that are classified in this category shall be labelled in accordance with 6.1
- 5.1.2 If a **Type A** Cylinder is a fixed installation or forms part of a plant, such a cylinder, in addition, shall be labelled with the name of the gas in accordance with Table 2.

5.2 *Type B Cylinders*

- 5.2.2 **If a Type B cylinder** is fixed installation or part of a plant, such a cylinder shall be labelled with the name of the gas as in Table 2
- 5.2.3 A **Type B** cylinder fixed on a tube trailer the tube trailer shall carry signs on the rear and on both sides in accordance with 6.2.

5.3 *Type C cylinders*

- 5.3.1 All gas cylinders that are classified in this category shall be marked in accordance with 6.1
- 5.3.2 If these cylinders are used for the bulk transportation of gas, the truck or trailer on which they are mounted shall carry signs on the rear and on both sides in accordance with 6.4

5.4 *Imported Gases and Cylinders*

- 5.4.1 Cylinders of **Types A and B** containing gases imported into Belize are required to be labelled in accordance with 6.5.
- 5.4.2 Cylinders shall be marked as required by this standard when refilled in Belize for use in this country.
- 5.4.3 Where a gas is imported in **Type C** Cylinders and is transferred to a **Type A** or **Type B** cylinder, the latter shall be marked as required by 6.1.

5.5 Storage and Transportation

- 5.5.1 No gas shall be stored or transported in a cylinder which is not labelled as required by this standard.
- 5.5.2 When cylinders are being transported the vehicle shall be labelled in accordance with the requirements of 6.4.
- 5.5.3 The vehicle transporting the cylinders shall carry a sign in a conspicuous place showing the name of the gas or gases and cautionary notes which identify the properties of the gas or gases.

Table 2 – Cautionary label for gases for industrial or domestic use

Chemical or Trade Name of Gas and Formula	Recommended Cautionary Note and Symbol	
	Note	Symbol Name and Word
(1)	(2)	(3)
Anhydrous Ammonia (NH ₃)	Avoid Inhaling Gas	Skull “Poison”
Argon (Ar)	Avoid Inhaling Gas	-
Acetylene (C ₂ H ₂)	Highly Explosive Avoid Naked Flames and Sparks. No smoking within 3 metres. Working Pressure should not exceed 100 kPa (15psig.) Always keep cylinder in upright position.	Flame “Flammable”
Carbon Dioxide (CO ₂)	Avoid Inhaling Gas	-
Carbon Monoxide	Avoid Inhaling Gas	Skull “Poison” Flame “Flammable”
Chlorine (Cl ₂)	Avoid Inhaling Gas	Skull, “Poison”
Ethane (C ₂ H ₆)	Avoid Inhaling Gas. Keep away from naked flames and sparks. Highly explosive	Flame, “Flammable”

Chemical or Trade Name of Gas and Formula (1)	Recommended Cautionary Note and Symbol	
	Note (2)	Symbol Name and Word (3)
Ethylene (C ₂ H ₄) (Ethene)	Avoid Inhaling Gas. Keep away from naked flames and sparks. Highly explosive	Flame, "Flammable"
Fluorine (F ₂)	Avoid contact with skin. Avoid inhaling gas.	Skull, "Poison" Corrosive
Helium (He)	Do not use grease or oil. Avoid inhaling gas	
Hydrogen (H ₂)	Keep away from naked flames and sparks. Highly explosive. Avoid Inhaling gas	Flame
Hydrogen Chloride (HCl)	Avoid contact with skin. Avoid inhaling gas.	Skull, "Poison" Corrosive
Krypton (Kr)	Avoid inhaling gas	-
Liquefied Petroleum Gas (LPG) - Propane (C ₃ H ₈) - Butane (C ₄ H ₁₀) or - Propane-Butane Mixture	Avoid naked flames. Handle with care. Keep cylinder in an upright position. If you smell gas, disconnect the cylinders immediately and put them outdoors.	Flame, "Flammable"
Neon (Ne)	Avoid inhaling gas	-
Nitrogen (N ₂)	Avoid inhaling gas	-
Oxygen (O ₂)	Do not use on grease. Do not use oxygen for compressed air. Keep away from naked flames and sparks. No smoking	Oxidiser

Chemical or Trade Name of Gas and Formula (1)	Recommended Cautionary Note and Symbol	
	Note (2)	Symbol Name and Word (3)
Propylene (Propene) (C ₃ H ₆)	Avoid inhaling gas. Avoid naked flames. Handle with care. Keep cylinder in upright position	Flame "Flammable"
Refrigerant Gases	Avoid inhaling gas. Trade name of gas and type	-
Sulphur Dioxide (SO ₂)	High concentration affects the skin. Avoid contact with skin. Avoid inhaling gas.	Skull, "Poison"

6 LABELLING AND MARKING

6.1 General requirements

6.1.1 **Type A** cylinders shall be legibly and durably marked in close proximity to the valve, with the following information given in the English Language:

- a) the name or chemical formula of the gas it contains as set out in Table 2;
- b) the name and address, or trade mark of the manufacturer of the gas; or the firm which filled the cylinder;
- c) any cautionary note and warning symbol set out in Table 2 and Appendix A as applicable to the gas; and in accordance with BZS 1: Part 1: 1998 Specification for labelling: General Principles;
- d) the net contents of gas in cylinder in terms of mass (kilograms)/pounds or volume in standard cubic metres/gallons; and
- e) The tare weight, being the weight of the cylinder and valve (excluding any valve cover), if it is intended to be used for liquefiable gases;
- f) the maximum pressure of the gas at 27 °C in kilopascals (psi);
- g) The specification to which the cylinder was manufactured;

- h) The date of the original and of any periodical hydraulic stretch test, and the identification mark of the person or firm who made each test;
- i) The test pressure in megapascals (psi).

- 6.1.2 In the case of refrigerants, the trade name and type number may be used.
- 6.1.3 In the case of mixtures of gases (other than liquefied petroleum gases and air) the name of each gas shall appear on the label.
- 6.1.4 The letters and numbers used for the name and chemical formula shall be most prominent. They shall be legible and have a minimum height of 1/25 of external diameter of the cylinder, but not less than 6 mm.
- 6.1.5 The information required in 6.1 may be displayed on the cylinder by stamping, stenciling, adhesive label or print.

6.2 *Application of Warning Symbols*

- 6.2.1 The affixing, removal and replacement of the warning symbols shall be performed by the consigner.
- 6.2.2 The symbols shall be securely affixed to the cylinder so that they are completely visible. Symbols shall not be folded or affixed in such a manner that parts of the same label appear on different faces of the cylinder. Symbols shall also be affixed in similar fashion to the outside of the transport packaging. If this is impossible, they may be attached to the packaging by means of strong tags. The symbols shall be maintained in a legible condition for as long as the cylinder remains in service with the same gas.
- 6.2.3 The symbols shall be located by preference on the shoulder of the cylinder, but shall not cover any permanent markings essential for filling. If necessary, they may be located on the side of the cylinder at a point approximately two-thirds of the distance from the cylinder base to the top of the valve or cap.
- 6.2.4 Before affixing new symbols, the old ones shall be removed completely. Affixing new symbols over old ones is permitted only if the information content of the symbols is identical.
- 6.2.5 Where two or more symbols are necessary, the subsidiary symbol(s) shall be placed to the right of the primary warning symbol. In configurations where the symbols overlap, the primary symbol shall partially cover the subsidiary symbol(s) so that, in all cases, the primary symbol remains unobscured.

- 6.2.6 The primary symbol shall indicate the numeral 2, in accordance with the classification system for dangerous goods established by the United Nations. If more than one symbol is required the numeral shall only be shown on the diamond for the symbol

6.3 Fixed Installations

- 6.3.1 Cylinders that are fixed to a particular location or a plant shall be marked in accordance with 6.1
- 6.3.2 The characters used in marking the name of the gas shall be legible and have a minimum height of 6 mm

6.4 Bulk Transportation Cylinders, Bulk Carriers and Tube Trailers

Bulk carriers and tube carriers used for the bulk transportation of gas shall carry signs on both sides and the back showing the name of the gas and cautionary notes which identify the properties of the gas. The characters used in marking the name of the gas shall have a minimum height of 150 mm, and shall be legible.








6.5 Imported Gases

When gases are imported into Belize the name of the gas shall be displayed on the cylinder by stamping, stenciling, transfer, adhesive label or print. Where applicable, cautionary notes and warning symbols shall be affixed to the cylinder.

ANNEX A (normative) Warning symbols

- A.1 Table A.1 provides the colours, meaning and labels of warning symbols to be used on cylinders.
- A.2 The colour, design, symbols, numerals and text comprising each label shall be as required by the *United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations* or other applicable modal transport or national regulations.
- A.3 Gas cylinders with more than one warning symbol carry contents with more than one hazardous property.

Table A.1 Hazard Labels


















Label No.	Labels	Colors of Label	Hazard
2.2	 or 	Green + white or green + black	Non-flammable, non-toxic
2.1	 or 	Red + white or red + black	flammable
2.3		White + black	toxic
5.1		Yellow and black	oxidizing
8		White and black	corrosive




ANNEX B (informative) Examples of Warning Symbols used on cylinders

B.1 Table B.1 shows examples of use of warning symbols used for different types of gases.

The list does not represent every possible combination but serves as an example of use of hazard labels on cylinders.

Table B.1 – Examples of hazard labels for cylinders indicating class number

Division ^a	Subsidiary hazard ^b	Label(s) ^{c, d}				Examples ^e	
2.2			or			UN 1013 CARBON DIOXIDE	
2.2	5.1		or		and		UN 1072 OXYGEN, COMPRESSED
2.1			or			UN 1011 BUTANE UN 3374 ACETYLENE, SOLVENT FREE UN 1075 LIQUEFIED PETROLEUM GASES (LPG)	
2.3						UN 1062 METHYL BROMIDE UN 1955 COMPRESSED GAS, TOXIC, N.O.S	
2.3	2.1		and			UN 1017 CHLORINE UN 1005 AMMONIA, ANHYDROUS	
2.3	8		and			UN 1017 CHLORINE	
2.3	5.1		and			UN 3083 PERCHLORYL FLUORIDE	
2.3	2.1, 8		and		and		UN 2189 DICHLOROSILANE

Division ^a	Subsidiary hazard ^b	Label(s) ^{c, d}			Examples ^e	
2.3	5.1, 8		and		and	 UN 1045 FLOURINE, COMPRESSED

^a As given in column 3 of the Dangerous Goods List in Chapter 3.2 of the *UN Recommendations on the Transport of Dangerous Goods – Model Regulations* (13th revised edition).

^b As given in column 4 of the Dangerous Goods List in Chapter 3.2 of the *UN Recommendations on the Transport of Dangerous Goods – Model Regulations* (13th revised edition).

^c Labels indicating the primary hazard for class 2 shall bear class numbers in the bottom corner as indicated in Table A.1.

^d Colours used for labels are primary colours or black and white.

^e Name of examples includes UN Classification number as given in column 1 of the Dangerous Goods List in Chapter 3.2 of the *UN Recommendations on the Transport of Dangerous Goods – Model Regulations* (13th revised edition).

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