CYLINDER PRODUCT LABELS

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1. INTRODUCTION

Across the Middle East there is a lack of national regulations or clear standards for product identification and the consequent hazards that these might pose. The compressed gases are primarily identified by the product labels affixed on the cylinder neck of cylinders and by the color codes.

MEGA realizes the consequences of potential of harm to human life and property damage that can occur due to misidentifying the product, not comprehending the product hazards, using the product wrongly etc. This document covers the most basic requirement of identification of the product and the hazards of the compressed gases, by means of product labeling.

In preparing this document the current industry practices of IGCs (Industrial Gas Companies) in the Middle East have been reviewed. The MEGA recommendation is for the adoption of the latest UN recommendations formulated in the GHS (Globally Harmonized System). The adoption of these standards will mitigate the risks associated with misidentification of the product, filling incorrect product, wrong product delivery to consumer, provide the first and key information on the product hazards etc.

2. BACKGROUND

Under the umbrella of the UN (United Nations) CLP Regulation has been initiated. The CLP regulations were initiated in 1992 in Rio de Janeiro at the first UN Conference of the Environment and Development. One of the resolutions of the conference was to create by the year 2000 a Globally Harmonized System (GHS) for the classification and labelling of chemicals, for all sectors and worldwide. This project resulted in the Globally Harmonized System (GHS) adopted in December 2002 by the UN Committee of Experts for the Transport of Dangerous Goods and for the GHS (UNCE-TDG/GHS).

The aim of this document is to propose that industrial gas companies across the Middle East to be compliance with the new GHS (globally harmonized system) requirements and the transport regulation standard of product labeling for owned cylinders to have a fully coordinated system.

3. SCOPE

This document details the requirement for the content on the product labels. This structure of the product label is applicable for compressed gases in general. Additionally, the product labels to be used for the commonly used pure gases are also provided here. These are:

- Acetylene
- Argon
- Compressed Air
- Helium
- Hydrogen
- Nitrogen
- Nitrous Oxide
- Oxygen

Client owned cylinders for the above gases are also in the scope of this product labelling standard.

Medical gases, gas mixtures, corrosive, pyrophoric, toxic etc. are not covered in this document.
4. MEGA RECOMMENDATIONS

MEGA’s approach has been to adopt the requirements and the output of the CLP regulations or the GHS. In the selection of the content MEGA has referred to the EIGA document (SAC Doc 169/14/E, Classification and Labelling Guide).

This effort is expected to provide harmonized labels and label content for the IGCS (Industrial Gas companies) operating under the umbrella of MEGA. MEGA recommends implementing the Product Labelling of cylinders as per standard, as soon as practically possible, once stocks of existing labels are used up.

5. TERMS AND DEFINITIONS

For the purpose of this document, the following terms and definition apply.

5.1. **Gas:**

*Gas* means a substance which (i) at 50 °C has a vapour pressure greater than 300 kPa (absolute); or (ii) is completely gaseous at 20 °C at a standard pressure of 101.3 kPa

This definition means that pure substances are considered as gases when their boiling point (BP) is not higher than 20°C. Substances with a boiling point higher than 20°C are “liquids” except those few that develop a vapour pressure higher than 300 kPa at 50°C; these liquids are considered as “gases” because of the hazard of pressure when packaged.

5.2. **Gas for Medical Use:**

Any gas or mixture of gases intended to be administered to patients for therapeutic, diagnostic or prophylactic purposes, with or without pharmacological action, or to be used for surgical tools, and it covers both medicinal and medical gases. (For Medical Gases, refer ‘Medical Gases Cylinder Product Labelling’ document.)

5.3. **Inert Gas:**

Non-toxic, non-corrosive, non-flammable and non-oxidizing gas or gas mixture.

5.4. **Synthetic air:**

For medical use to refer pharmacopoeia, monograph 1684, and for other use mixtures containing 20% to 23.5% oxygen in nitrogen to be considered.

5.5. **Industrial gas:**

Gas or gas mixtures not covered by 5.2 and not used for breathing gas use.

5.6. **Breathing gas:**

Gas filled in cylinders for breathing and diving application, excluding gas for medical use.

5.7. **GHS**

Globally Harmonized System.

5.8. **GCC**

Gulf Cooperation Council. GCC countries include, Bahrain, Kuwait, Qatar, Oman, Kingdom of Saudi Arabia and United Arab Emirates.
6. CYLINDER LABELLING GUIDELINES

This section covers the requirements for cylinder label. The requirements for the information and the content are explained below. Also a practical example of a product label of acetylene is used. Each of the requirements of the product label content and information is cross referenced to the label by means of a numeric number for ease of reference and use. The numeric numbers mentioned in each section are also shown on the cylinder label highlighted in yellow.

As a reference the CLP Regulation states that “manufacturers, importers and downstream users shall classify substances or mixtures before placing them on the market. Where a substance or mixture is classified as hazardous, suppliers shall ensure that the substances or mixture is labelled and packaged in accordance with Titles III and IV of the CLP Regulation before placing it on the market.”

6.1. Product Label Content

When pasting the product label it is to be ensured that the permanent stamped markings on the cylinder shoulder should not be covered. The below are the labeling requirements to be reflected on the labels:

- Name, address and telephone number of the supplier
- Product identification
- Hazards pictogram(s)
- Signal word(s)
- Hazard statement(s)
- Precautionary statement(s)
- Any other supplemental information

6.1.1. Name, address and telephone number of supplier

The companies log will appear on the top left hand side of the label. Additionally, the information on the address and contact information (telephone number etc.) will be reflected on the right bottom of the cylinder label.

In the example, this is reflected as point 1 and point 6 marked on the cylinder label.

6.1.2. Product Identification

The product identification is done by means of the UN No. and the UN description of the product. It is the name appearing in the CLP regulation. This can be referred to from the tables
in section 4 of the EIGA document (SAC Doc 169/14/E). The name shall appear on the top right hand side of the label.

Additional to the official UN number and description, the companies have the choice of putting in place the name of the gas (this may include the proprietary / brand names) and the location for this shall be below the company’s logo (which is placed on the top left hand side of the label). In the example, this is reflected as point 2 marked on the cylinder label.

6.1.3. Hazard Pictograms

The hazard pictograms to be used for the gases are derived from the tables of section 4 of the EIGA document (SAC Doc 169/14/E).

- The pictograms are shown here, for the flammable gases (e.g. Hydrogen and Acetylene).
- It is important to note:
  - The GHS pictograms has to be shown fully and without overlap.
  - Only the transport pictograms are allowed to be overlapped.

In the example demonstrated here these are labeled as Includes 7a and 7b.

6.1.4. Signal Words

The signal words will be either “Danger” or “Warning”. Both of these signal words can not be used on the same label. In the example of the label, this is reflected as 8. In the example, this is reflected as point 8 marked on the cylinder label.

6.1.5. Hazard Statements

The label shall cover all the relevant hazard statements determined by the classification for the different hazard classes, except when there is duplication. Annexure 6.1 of the EIGA document (SAC Doc 169/14/E) reflects the hazard statements per the regulations. Table 4.6 Labelling Data of the same document summarizes the choice of the hazard statements accepted for each of the gases.

6.1.6. Precautionary Statements

Precautionary or P-statements are not the part of the legal requirement that used to exist for the safety or S-phrases in the previous system for the labeling. These are cross referenced and are reflected in the same tables as mentioned in the section of the hazard statements.

6.1.7. Supplemental Information

Additional phrases that are used as a standard in the gas industry such as: close valve after each use, return with residual pressure etc. are part of the supplemental phrases.

The above three sections, i.e. 6.1.5 hazard statements, 6.1.6 precautionary statements and 6.1.7 supplemental phrases are all reflected at location 9 of the example cylinder label.

- The minimum letter size is 6 mm (or 24 pt)

6.1.8. Other Information

This information may be for any other additional statement or even information on the filling pressure, volume content etc.
This can be provided at the locations 3, 4 and 5 marked on the cylinder label.

6.2. **Dimensioning and Size**

In addition to the instructions above detailing the content and sizes it is important to note that the font sizes should be large enough to allow easy readability of the user. The CLP regulations only recommends the minimum size for these labels and this is 74mm x 105 mm.

6.2.1. **Dimensions**

In the case of MEGA, with respect to the nature of (and complexity) where many different languages are being spoken and used, it is required to have the labels bi-lingual, i.e. in Arabic and English. This in turn reflects on the size of the label itself.

MEGA recommends minimum sizes for product labels:

- Flammable gas - 160 mm x 74 mm
- Oxidising gas - 150 mm x 74 mm
- Inert gas - 105 mm x 74 mm

However, due to the bilingual nature of the labels proposed the sizes can be larger. The rule for compliance will be to make sure that the key cylinder markings do not get covered, when pasting the labels.

The minimum size for the pictogram label is 25mm x 25mm: for cylinders with diameter >= 180mm). There is no requirement for the centring of the pictograms on the labels and these can be off centered and located suitably.

6.2.2. **Font Size**

For 1. min. 8 pts
For 2. min. 24 pt for UN No. and min. 10 pt for UN product description
For 3, 5, 6 optional to the discretion of the Individual Gas Producer e.g. Use in accordance with SDS)
For 8 min. 7 pt
For 9 min. 5 pt (the lettering should enable clear and easy readability)

6.3. **Example**

![Example of a cylinder label with dimensions and font size annotations](image)
### 6.4. Table with Product Label Content Information

**Cylinder Label Content based on the United Nation’s GHS (globally harmonized system)**

*It is important to note that the transport pictograms take precedence on the pictograms in the table below*

<table>
<thead>
<tr>
<th>UN No</th>
<th>UN Description</th>
<th>UN Class</th>
<th>Hazard - Phrase</th>
<th>Prevention - Phrase</th>
<th>Further Phrases on cylinder product label</th>
</tr>
</thead>
<tbody>
<tr>
<td>1001</td>
<td>Acetylene (dissolved)</td>
<td>2.1</td>
<td>Extremely flammable gas; Contains gas under pressure, may explode if heated</td>
<td>Keep away from heat/sparks/open flames/hot surfaces. - No smoking.</td>
<td>Return with residual pressure! Use in accordance with company specific safety data sheets. Close valve after use</td>
</tr>
<tr>
<td>1006</td>
<td>Argon, compressed</td>
<td>2.2</td>
<td>Contains gas under pressure, may explode if heated</td>
<td>-</td>
<td>Return with residual pressure! Use in accordance with company specific safety data sheets. Close valve after use</td>
</tr>
<tr>
<td>1013</td>
<td>Carbon dioxide</td>
<td>2.2</td>
<td>Contains gas under pressure, may explode if heated</td>
<td>-</td>
<td>Return with residual pressure! Use in accordance with company specific safety data sheets. Close valve after use</td>
</tr>
<tr>
<td>1046</td>
<td>Helium, compressed</td>
<td>2.2</td>
<td>Contains gas under pressure, may explode if heated</td>
<td>-</td>
<td>Return with residual pressure! Use in accordance with company specific safety data sheets. Close valve after use</td>
</tr>
<tr>
<td>1066</td>
<td>Nitrogen compressed</td>
<td>2.2</td>
<td>Contains gas under pressure; may explode if heated</td>
<td>-</td>
<td>Return with residual pressure! Use in accordance with company specific safety data sheets. Close valve after use</td>
</tr>
<tr>
<td>1049</td>
<td>Hydrogen, compressed</td>
<td>2.1</td>
<td>Extremely flammable gas; Contains gas under pressure, may explode if heated</td>
<td>Keep away from heat/sparks/open flames/hot surfaces. - No smoking.</td>
<td>Return with residual pressure! Use in accordance with company specific safety data sheets. Close valve after use</td>
</tr>
<tr>
<td>1072</td>
<td>Oxygen compressed</td>
<td>2.2 + 5.1</td>
<td>May cause or intensify fire, oxidizer</td>
<td>Store away from combustible materials: Keep valves and fitting free from oil and grease.</td>
<td>Return with residual pressure! Use in accordance with company specific safety data sheets. Close valve after use</td>
</tr>
<tr>
<td>1070</td>
<td>Nitrous oxide</td>
<td>2.2 + 5.1</td>
<td>Contains gas under pressure, may explode if heated; may cause or intensify fire: oxidizer.</td>
<td>Store away from combustible materials: Keep valves and fitting free from oil and grease.</td>
<td>Return with residual pressure! Use in accordance with company specific safety data sheets. Close valve after use</td>
</tr>
<tr>
<td>1002</td>
<td>Air compressed</td>
<td>2.2</td>
<td>High pressure compressed gas may accelerate combustion</td>
<td>Keep away from heat, flame or sparks. Keep oil, grease and other combustible away.</td>
<td>Return with residual pressure! Use in accordance with company specific safety data sheets. Close valve after use</td>
</tr>
</tbody>
</table>
7. PRODUCT LABEL AND CONTENT TEXT

- Acetylene Dissolved

- Argon Compressed

- Carbon Dioxide
- Helium Compressed

- Nitrogen Compressed

- Hydrogen Compressed
- Oxygen Compressed

- Nitrous Oxide

- Air Compressed
7.1. Hazard, Precautionary & Supplemental Statements

**UN 1001 ACETYLENE DISSOLVED**

Extremely flammable gas.  
May react explosively even in absence of air.  
Contains gas under pressure; may explode if heated.  
Explosive with or without contact with air.  
Keep away from heat, sparks, open flames or hot surfaces.  
In case of a leaking gas fire; Do not extinguish, unless leak can be stopped safely.  
Eliminate all ignition sources if safe to do so.  
Store in well-ventilated place.  
Dispose of cylinder via gas supplier only; cylinder contains a porous material which in some cases contains asbestos.  
Insure to close the vale after use.  
Refer to SDS.

**UN 1006 ARGON COMPRESSED**

Contains gas under pressure; may explode if heated  
Store in well-ventilated place.  
Asphyxiant in high concentrations.  
Return with residual pressure  
Use in accordance with (gas company name) safety data sheet.  
Close valve after use.

**UN 1013 CARBON DIOXIDE**

Contains gas under pressure; may explode if heated.  
Store in well-ventilated place.  
Asphyxiant in high concentrations.  
Return with residual pressure! Use in accordance with (gas company name) safety data sheet.  
Close valve after use.
UN 1046 HELIUM COMPRESSED

Contains gas under pressure; may explode if heated
Store in well-ventilated place.
Asphyxiating in high concentrations.
Return with residual pressure! Use in accordance with (gas company name) safety data sheet.
Close valve after use.

UN 1066 NITROGEN COMPRESSED

Store in well-ventilated place.
Asphyxiating in high concentrations.
Return with residual pressure! Use in accordance with (gas company name) safety data sheet.
Close valve after use.

UN 1049 HYDROGEN COMPRESSED

Extremely flammable gas
Contains gas under pressure; may explode if heated
Keep away from heat, sparks, open flames or hot surfaces.
In case of a leaking gas fire; do not extinguish, unless leak can be stopped safely.
Eliminate all ignition sources if safe to do so.
Store in well-ventilated place.
Return with residual pressure! Use in accordance with (gas company name) safety data sheet.
Close valve after use.
UN 1072 OXYGEN COMPRESSED

May cause or intensify fire; oxidizer.
Contains gas under pressure; may explode if heated.
Keep valves and fitting free from oil and grease.
Store in well-ventilated place.
Store away from combustible materials.
In case of a leaking gas fire; stop leak if safe to do so.
Return with residual pressure! Use in accordance with (gas company name) safety data sheet.
Close valve after use.

UN 1070 NITROUS OXIDE

May cause or intensify fire; oxidizer.
Contains gas under pressure; may explode if heated.
Keep valves and fitting free from oil and grease.
Store in well-ventilated place.
Store away from combustible materials.
In case of a leaking gas fire; stop leak if safe to do so.
Return with residual pressure! Use in accordance with (gas company name) safety data sheet.
Close valve after use.
UN 1002 AIR COMPRESSED

Contains gas under pressure; may explode if heated.
Store in a well-ventilated place.
Return with residual pressure!
Use in accordance with (gas company name) safety data sheet.
Close valve after use.

8. REFERENCES

- EIGA Document – SAC Doc 169/14/E, Classification and Labelling Guide
  www.eiga.eu