



INDUSTRIAL GAS CYLINDERS COLOR CODING

TD 08/15/E

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| Color coding chart for Industrial gases | |

1. INTRODUCTION

Across the Middle East, there are no clear standards for colour coding of cylinders for different product lines. The prevalence of large numbers of different color codes for same product line within the industries under MEGA is regarded as potentially misleading and hazardous. There is a high risk of the wrong product(s) being filled if the labels are not legible. Although the label fixed on the cylinder remains the primary means of identifying the product it contains, cylinder color coding is routinely used as the secondary means of identification to ensure that the correct product is filled , supplied and used.

The hazards associated with filling a wrong product into cylinders include loss of production, property damage and injury or death to personnel.

There is an essential requirement of harmonizing of cylinder color codes with different product lines to eliminate filling errors at source and the incorrect product delivery to the consumer's supply systems.

2. SCOPE AND PURPOSE

2.1. Scope

The scope of this document is to propose all member companies, other than Kingdom of Saudi Arabia, to follow the BS EN 1089-3 standard of color code for owned cylinders to get a fully harmonized color coding system.

MEGA member companies in the Kingdom of Saudi Arabia will follow a separate color code. The colour code outlined in this document applies specifically to gas cylinders for pure gases, gas mixtures for industrial applications, and breathing gas (non medical) use.

Client-owned cylinders or cylinders to be exported are exempted from the scope of this publication.

2.2. Purpose

The purpose of this document is to provide guidance to all industrial gas cylinder fillers and suppliers on the implementation of and adherence to the color coding principles outlined in BS EN 1089-3

It is also intended that this document provide guidance to local regulatory authorities about the correct use of color coding to identify the gas contained in the cylinder.

3. CYLINDER COLOR CODING PRINCIPLES

BS EN 1089-3 was introduced as a European standard for the color coding of gas cylinders, so that there could be a common approach to color coding of all cylinders across Europe. MEGA recommends this standard to be followed by all industrial gas cylinders suppliers across GCC. The basic principle used in BS EN 1089-3 for the color coding of cylinders is that only the shoulder of the cylinders should be used to define either product or the hazard associated with the gas.

For cylinders in industrial gas service, it is recommended that the bodies of all industrial gas cylinders be painted grey or the same colour as the shoulder.


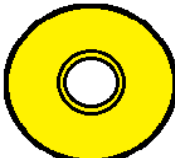
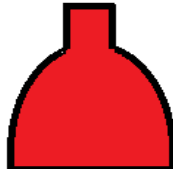





Cylinders in medical gas service shall follow the guidelines outlined in MEGA Technical Document, *TD 09/15/E-Medical Gas Cylinders Colour Coding*.

4. COLOR CODING

4.1. Basic hazard color coding

The color coding of the cylinder shoulder is determined by the hazard associated with the contents as prescribed by the transport labels (cylinders product label)

The four categories are defined below;







| Gas Property | Shoulder color | | RAL Number |
|-------------------------|----------------|---|------------|
| Toxic and /or Corrosive | Yellow |   | 1018 |
| Flammable | Red |   | 3000 |
| Oxidizing | Light Blue |   | 5012 |
| Inert | Bright Green |   | 6018 |


The table gives the scale of hazard in descending order. When a gas has more than one hazard, the color coding of the shoulder is defined by highest hazard, as above.


4.2. Cylinder shoulder color

BS EN 1089-3 specifies the color coding for the most commonly used industrial gases and industrial gas mixtures.

The color codes specified for the gases covered by this standard include :

| Gas | Color | Shoulder Color | RAL number | RAL designation |
|-------------------------|--------------|---|------------|-----------------|
| Argon | Dark Green |  | 6001 | Emerald Green |
| Nitrogen | Black |  | 9005 | Jet Black |
| Carbon Dioxide | Grey |  | 7037 | Dusty Grey |
| Helium | Brown |  | 8008 | Olive Brown |
| Oxygen | White |  | 9010 | Pure White |
| Mixtures of inert gases | Bright Green |  | 6018 | Yellow Green |

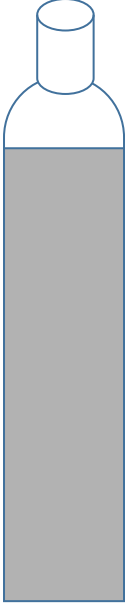


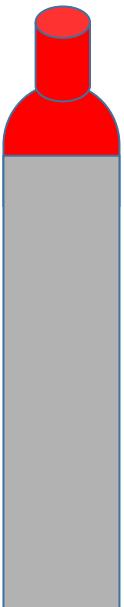




| | | | | |
|---------------------|--------------|---|-------------|--------------------------|
| Flammable | Red |  | 3000 | Flame Red |
| Flammable mix | Red |  | 3000 | Flame Red |
| Acetylene | Maroon |  | 3009 | Oxide Red |
| Nitrous Oxide | Blue |  | 5010 | Gentian Blue |
| Oxidizing Mix | Light Blue |  | 5012 | Light Blue |
| Toxic or Corrosive | Yellow |  | 1018 | Zinc Yellow |
| Toxic and Corrosive | Yellow & Red |  | 1018 & 3000 | Zinc Yellow Flame Red |




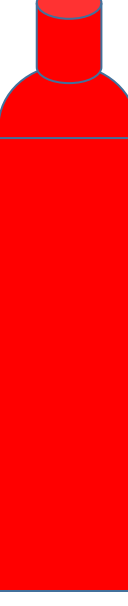




| | | | | |
|---------------------|--------------|---|-------------|--------------------------|
| Toxic Flammable mix | Yellow & Red |  | 1018 & 3000 | Zinc Yellow Flame Red |
|---------------------|--------------|---|-------------|--------------------------|

5. CYLINDER BODY

All industrial gases and industrial gas mixtures shall have their shoulder areas painted as outlined in sections 4.1 and 4.2. The color of the cylinder body is not mandated. Gas suppliers may choose their own colours or to use the same colour as the shoulder colour. Caution must be exercised to not conflict or confuse with previously used colour codes, or colour codes required by the MEGA pamphlet outlining the colour codes for Medical Gases.

MEGA recommends that when a neutral body colour is desired, the colour Grey be used.

| Industrial gas cylinder color code for GCC (KSA excluded) | | | | | | | |
|---|---|---|---|---|--|---|---|
| Oxygen | Nitrogen | Argon | Hydrogen | Acetylene | Carbon dioxide | Helium | Carbon Monoxide |
|  |  |  |  |  |  |  |  |

| Industrial gas cylinder color code for KSA | | | | | | | |
|--|--|--|--|--|---|--|--|
| Oxygen | Nitrogen | Argon | Hydrogen | Acetylene | Carbon dioxide | Helium | Carbon Monoxide |
|  |  |  |  |  |  |  |  |

6. CYLINDER VALVE GUARD COLOR CODING

There is no requirement to color code the cylinder valve guards or protective caps.

7. CYLINDER BUNDLES

There is no requirement in BS EN 1089-3 to color code the cylinders used in cylinder bundles. If the gas supplier decides to color code the cylinders in cylinder bundles, then the principles of this pamphlet shall be applied.

8. TERMS AND DEFINITIONS

For the purposes of this document, the following terms and definitions apply.

8.1. 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 (see ISO 5145).

The colour code for medical gases is mandated in MEGA Technical Document, *TD 09/15/E-Medical Gas Cylinders Colour Coding*.

8.2. Inert gas

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

8.3. Industrial gas

Gas or gas mixtures not for medical or for breathing gas use.

8.4. Breathing gas

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

9. SUPPLIER RESPONSIBILITIES

Prior to delivery of filled cylinders to customers, it is the supplier's responsibility to ensure that the cylinders are correctly labelled and painted in accordance with this standard.

All new cylinders to be put into service after publication of this standard are to follow it immediately.

Suppliers are to implement this standard as of the date of publication.

All existing cylinders should be converted to the new standard as quickly as is practicable, but in any event no later than later than 31st December 2019.

10. REFERENCES

- BS EN 1089-3
- MEGA Technical Document, *TD 09/15/E-Medical Gas Cylinders Colour Coding*.

ANNEXE

| RAL No. | RAL Designations | Industrial | Breathing Non medical |
|--------------|------------------|------------|--------------------------|
| RAL No. 9010 | Pure White | | |
| RAL No. 6001 | Emerald Green | | |
| RAL No. 7037 | Dusty Grey | | |
| RAL No. 5010 | Gentian Blue | | |
| RAL No. 8008 | Olive Brown | | |
| RAL No. 9005 | Jet Black | | |
| RAL No. 6018 | Yellow Green | | |
| RAL No. 1018 | Zinc Yellow | | |
| Ral No. 6018 | Yellow Green | | |
| Ral No. 3000 | Flame Red | | |
| RAL No. 5012 | Light Blue | | |

| RAL No. | RAL Designations | Industrial | Breathing Non medical |
|--------------|------------------|------------|--------------------------|
| RAL No. 9010 | Pure White | | |
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| RAL No. 1018 | Zinc Yellow | | |
| Ral No. 6018 | Yellow Green | | |
| Ral No. 3000 | Flame Red | | |
| RAL No. 5012 | Light Blue | | |

| Gas | Percentage | Industrial | Breathing Non medical |
|-------------------------|---|------------|--------------------------|
| Oxygen | >21.0% O ₂ | | |
| Nitrogen | >75.0% N ₂ | | |
| Argon | >99.99% Ar | | |
| Helium | >99.999% He | | |
| Carbon Dioxide | >99.999% CO ₂ | | |
| Methane | >99.999% CH ₄ | | |
| Acetylene | >95% C ₂ H ₂ | | |
| Hydrogen | >99.999% H ₂ | | |
| Carbon Monoxide | >99.999% CO | | |
| Air | >21.0% O ₂ , >78.0% N ₂ | | |
| Compressed Air | >21.0% O ₂ , >78.0% N ₂ | | |
| Medical Oxygen | >99.5% O ₂ | | |
| Medical Nitrogen | >99.5% N ₂ | | |
| Medical Argon | >99.999% Ar | | |
| Medical Helium | >99.999% He | | |
| Medical Carbon Dioxide | >99.999% CO ₂ | | |
| Medical Methane | >95% C ₂ H ₂ | | |
| Medical Hydrogen | >99.999% H ₂ | | |
| Medical Carbon Monoxide | >99.999% CO | | |
| Medical Air | >21.0% O ₂ , >78.0% N ₂ | | |
| Medical Compressed Air | >21.0% O ₂ , >78.0% N ₂ | | |

* Breathing air is a generic term used by the industrial and medical gases and is also used in the pharmacopoeia for medical purposes only in Germany (DIN EN ISO 10005-3:2013)

** Mixture that contains more than 75% of carbon dioxide and less than 25% of oxygen are life threatening if they are breathed continuously at atmospheric pressure

*** Mixture that contains more than 75% of carbon dioxide and less than 25% of oxygen are life threatening if they are breathed continuously at atmospheric pressure

Standard followed BS EN 10005-3:2013