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TECHNICAL INFORMATION SHEET 6

GAS CYLINDER IDENTIFICATION. LABEL AND COLOUR CODE REQUIREMENTS.

Background

Each individual gas cylinder shall have a label which identifies its contents. The label also provides basic safety information on the hazard(s) associated with the gas it contains. The primary and mandatory method of identifying the contents of a gas cylinder is by the label. The label contains information required by legislation, such as the *Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations* [1] and the *GB Classification Labelling and Packaging Regulations* [4]. It is the responsibility of the person filling the gas cylinder to affix a label, as agreed with the owner of the cylinder.

There are additional labelling requirements specified within *The Human Medicines Regulations* [2] for medicinal gas cylinders that are covered by a Marketing Authorisation.

The use of a colour code is a secondary means of identification. The colours applied to cylinders are generally not mandatory, apart from acetylene, but where a colour code is applied it is either related to a specific gas or it will identify the properties of a gas. The gases industry has harmonised colours across Europe in line with BS EN 1089-3 [6], *Transportable Gas Cylinders. Gas cylinder identification (excluding LPG). Colour Coding.*

The colours used for medicinal gases are harmonised and are consistent with ISO 32 [5], *Gas cylinders for medical use. Marking for identification of content.*

Labels

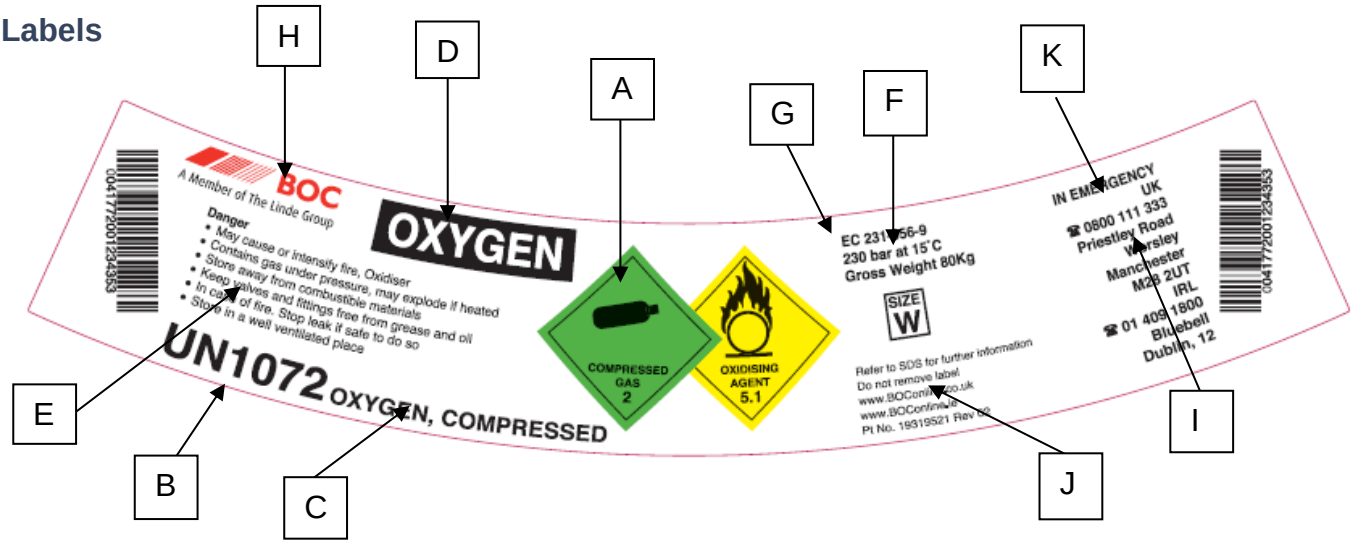


Figure 1: Example of a gas cylinder label

Figure 1 provides an example of a typical label. Usually the label is fixed to the cylinder shoulder or it may be located on a shoulder collar permanently attached to the cylinder. This keeps it clearly visible when cylinders are grouped together, allowing for quick and easy identification of the contents and hazards.

Labels for gas cylinders are allowed to be reduced in size and shape to the dimensions specified in BS EN ISO 7225 [7], *Gas cylinders. Precautionary labels*, for display on the shoulder section.

Information may also be reproduced on the cylinder body (for example, some LPG cylinders), for small cylinders a label may be located on the body (due to the limited space available), and for composite cylinders a label may be incorporated into the composite material. Other methods to provide this information are also available.

With reference to Figure 1, the following information is required on a label:

A A diamond hazard label, displaying the primary hazard with additional hazard labels displaying any subsidiary hazards. These labels will display the dangerous goods classification number.

NOTE: Diamond hazard labels can be overlapped when they are on a cylinder shoulder label and have been reduced in size.

B The UN number, preceded by the letters UN.

C The proper shipping name.

D Product name (may be omitted if the proper shipping name is identical).

E Signal word, hazard and precautionary statements.

F Package size and pressure.

G EC number, if applicable.

H Gas company name.

I Address of the gas company.

J Additional gas company information.

K Contact telephone number.

Guidance on the information for display on a label is available in EIGA 169 [11].

Colour codes

Colour coding is applied to the shoulder, or curved part, at the top of the cylinder. Some gases are assigned a specific colour. but where a gas does not have a specific colour, the properties of the gas are indicated by a generic colour. Two concentric bands may be used to show where a gas has more than one property or, alternatively, the two colours may be painted in quadrants. Bands should be approximately half the depth of the shoulder. Table 1 provides examples of bands and quadrants. In the case of gas mixtures there is no specific guidance in the standard, and different gas suppliers may use their own preferred system.

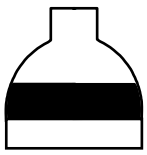
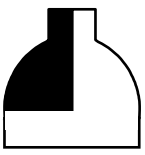
Air / synthetic air				

Table 1: Examples of bands and quadrants

For medicinal gases, where one of the bands signifies oxygen, this band (white) should be at the top to prevent confusion with the cylinder body.

Unless specifically identified, the properties and colours are in increasing order of hazard:

Inert:	Bright green
Oxidising:	Light blue
Flammable:	Red
Toxic:	Yellow

(i) The use of the stencilled letter 'N', which is used to show compliance with the colour requirements specified in BS EN 1089-3 [6], is not necessary in the UK.

(ii) The colour coding applies only to the cylinder shoulder.

(iii) Cylinder bodies. Apart from cylinders containing acetylene, medicinal gases or hydrogen, there is no defined colour scheme for the bodies of gas cylinders. For:

- acetylene cylinders, the body shall be coloured maroon, refer to the additional information at Table 3 (Note 2);

- medicinal gas cylinders, the body shall be coloured white (RAL 9010). For the BCGA policy on the colour coding of medicinal gas cylinders, refer to BCGA TIS 20 [10], *Medical gases. BCGA policy on colour coding*;

  NOTE: A medicinal gas cylinder is defined as a cylinder containing a medicinal gas for which a Marketing Authorisation (product licence) has been granted.

- hydrogen cylinders, the body and shoulder should be coloured red (RAL 3000).

The bodies of all other cylinders shall not be coloured white (this is exclusively for medicinal gas cylinders only) or maroon (this is exclusively for acetylene cylinders only), but may be coloured to a scheme selected by the gas company or cylinder owner provided that it does not conflict with the colour on the shoulder.

(iv) Colour coding of cylinders in bundles / packs is not a requirement of BS EN 1089-3 [6].

For bundles used for offshore diving applications the *International Marine Contractors' Association* (IMCA), make recommendations on the colour coding and marking of bundle frames. Refer to IMCA D043 [9], *Marking and colour coding of gas cylinders, quads and banks for diving applications*.

(v) There is no requirement in BS EN 1089-3 [6] to colour code the cylinder valve guard or protection cap. If they are coloured, then the colours used should align with the designated shoulder colour. If an alternative colour is used it should not conflict with the colour on the shoulder.

NOTE: RAL numbers used in this document refer to an internationally recognized colour matching system detailed in the register RAL 840 HR, obtainable from:

RAL gGmbH
Siegburger Strasse 39
D-53757 Sankt Augustin
Germany
https://www.ral-farben.de/en/

Additional colour marking on liquefied gases

Some cylinders which contain a liquefied gas are fitted internally with a dip tube (sometimes referred to as a siphon tube or dip pipe). A dip tube transfers liquid from the bottom of the cylinder up to the outlet valve. These cylinders may be identified by a white line (longitudinal stripe) on the side of the cylinder, and / or an annotated 'indicator' ring under the valve, for example with "DP" or "Dip Tube" embossed into it.

Figure 2: Example of a liquefied gas cylinder fitted with a dip tube

Tables 2 to 6 provide a visual guide to the colour schemes. The colours shown are for illustrative purposes only.

GAS TYPE	COLOUR	
Inert Note 1		Bright green - RAL 6018
Oxidising		Light blue - RAL 5012
Flammable		Red - RAL 3000
Toxic and / or corrosive		Yellow - RAL 1018

Table 2: Colour classification by hazard property

NOTE 1: An inert gas or gas mixture is non-toxic, non-corrosive, non-flammable and non-oxidising. An inert medicinal gas will usually have less than 20 % oxygen within the medicinal gas mixture.

GAS TYPE		COLOUR	
Acetylene Note 2	C_2H_2		Black Red - RAL 3007 (Body & shoulder)
Oxygen	O_2		White - RAL 9010
Nitrous oxide	N_2O		Blue - RAL 5010

Table 3: Specific gases

NOTE 2: In the UK, *The Acetylene Safety (England and Wales and Scotland) Regulations* [3] require that the body and shoulder of acetylene cylinders are painted RAL 3007, Black Red. Attention is drawn to the fact that acetylene cylinders originating in other European countries may be painted with RAL 3009, Oxide Red, the designated colour for acetylene in BS EN 1089-3 [6]. Commonly, these colours are referred to as being ‘maroon’.

GAS TYPE		COLOUR	
Argon	Ar		Dark green - RAL 6001
Nitrogen	N_2		Black - RAL 9005
Carbon dioxide	CO_2		Grey - RAL 7037
Helium	He		Brown - RAL 8008

Table 4: Inert gases for medicinal and industrial applications

GAS TYPE		COLOUR	
Air or synthetic air [Note 3] $O_2 \geq 20$ % but ≤ 23.5 %			White - RAL 9010 Black - RAL 9005
Helium / oxygen	He / O_2		White - RAL 9010 Brown - RAL 8008
Oxygen / carbon dioxide	O_2 / CO_2		White - RAL 9010 Grey - RAL 7037
Oxygen / nitrogen $O_2 < 20$ %	O_2 / N_2		Bright green - RAL 6018
Oxygen / nitrogen $O_2 > 23.5$ %	O_2 / N_2		Light blue - RAL 5012
Oxygen / nitrous oxide	O_2 / N_2O		White - RAL 9010 Blue - RAL 5010
Nitric Oxide / Nitrogen NO <1000 ppm (V/V)	NO / N		Turkish blue - RAL 5018

Table 5: Gas mixtures for medicinal or inhalation purposes

NOTE 3: The European Pharmacopoeia monograph for synthetic air (No. 1684) specifies the oxygen content to be 95 % to 105 % of the nominal value which is between 21 % and 22.5 % oxygen.

GAS TYPE		COLOUR	
Air or synthetic air $O_2 \leq 23.5$ %			Bright green - RAL 6018
Ammonia	NH_3		Yellow - RAL 1018
Chlorine	Cl_2		Yellow - RAL 1018
Hydrogen	H_2		Red - RAL 3000
Krypton	Kr		Bright green - RAL 6018
Methane	CH_4		Red - RAL 3000
Argon / carbon dioxide	Ar / CO_2		Bright green - RAL 6018
Nitrogen / carbon dioxide	N_2 / CO_2		Bright green - RAL 6018

Table 6: Examples of some industrial gases and gas mixtures

Cylinder test date rings

The use of a cylinder test date ring is not mandatory but it provides a ready indication of the next periodic inspection and test date of a gas cylinder. The test date ring is usually fitted during inspection and test. The test date ring consists of one or more plastic tabs, located between the cylinder and the valve. Each test date ring is colour coded and shaped to specifically indicate the year when the next periodic inspection and test is due. The test date ring may also give an indication of the month of the next due test. Only a test date ring that is unbroken and intact should be accepted as providing the correct information.

The sequence of colour and shape of test date rings is repeated on an 18-year cycle, hence 2037 is a repeat of 2019. Table 7 provides a guide to the colour and shape of test date rings.

NOTES:

1) Standards, such as BS EN ISO 18119 [8], *Gas cylinders. Seamless steel and seamless aluminium-alloy gas cylinders and tubes. Periodic inspection and testing*, permit other methods of identification, for example, labels.

2) Some companies may use the test date ring philosophy for other time-sensitive inspections of pressure equipment, such as relief valves.

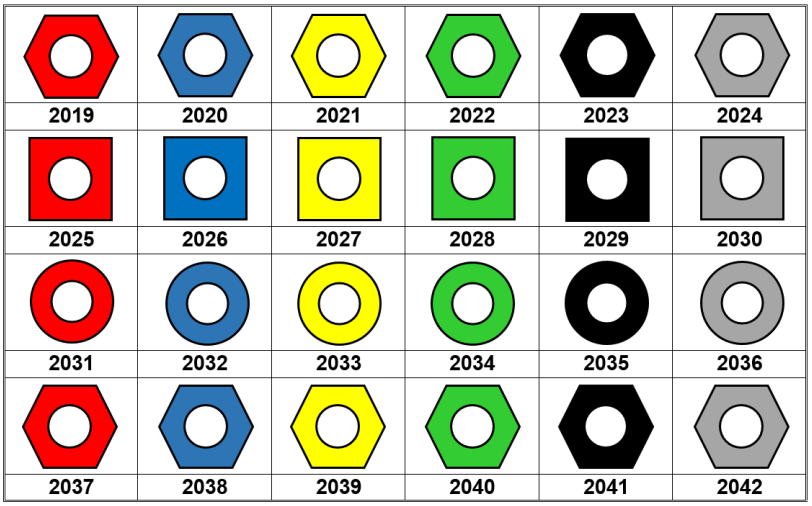


Table 7: Cylinder test date rings

References

1. SI 2009 No. 1348 — The Carriage of Dangerous Goods and use of Transportable Pressure Equipment Regulations 2009 (as amended).
2. SI 2012 No. 1916 — The Human Medicines Regulations 2012 (as amended).
3. SI 2014 No. 1639 — The Acetylene Safety (England and Wales and Scotland) Regulations 2014.
4. GB CLP — The Retained CLP Regulation (EU) No. 1272/2008, on the classification, labelling and packaging of substances and mixtures.
5. ISO 32 — Gas cylinders for medical use - Marking for identification of content.
6. BS EN 1089-3 — Transportable gas cylinders. Part 3 – Gas cylinder identification (excluding LPG). Colour Coding.
7. BS EN ISO 7225 — Gas cylinders. Precautionary labels.
8. BS EN ISO 18119 — Gas cylinders. Seamless steel and seamless aluminium-alloy gas cylinders and tubes. Periodic inspection and testing.
9. IMCA D 043 — Marking and colour coding of gas cylinders, quads and banks for diving applications.
10. BCGA TIS 20 — Medical gases. BCGA policy on colour coding.
11. EIGA 169 — Classification, and labelling guide in accordance with EC Regulation 1272/2008 (CLP Regulation).

For more information

UK Legislation	www.legislation.gov.uk
British Standards Institution (BSI)	www.bsigroup.co.uk
International Organization for Standardization (ISO)	www.iso.org
European Industrial Gases Association (EIGA)	www.eiga.eu
British Compressed Gases Association (BCGA)	www.bcga.co.uk
International Marine Contractors Association (IMCA)	www.imca-int.com