



## TECHNICAL INFORMATION SHEET 20

### MEDICAL GASES. BCGA POLICY ON COLOUR CODING

#### Background

Historically the UK gas industry colour coded medical gas cylinders in accordance with BS 1319C [1], *Colours for the identification of the contents of medical gas cylinders*. Following its withdrawal, medical gas cylinders are colour coded in accordance with BS EN 1089-3 [2], *Transportable gas cylinders. Gas cylinder identification (excluding LPG)*.

The purpose for the colour code in BS EN 1089-3 [2] is to allow the identification of the cylinder contents from a distance (this is especially helpful to the emergency services should a cylinder be involved in an incident, such as a fire).

BS EN 1089-3 [2] specifies the colour for the common gases used in many applications, not just medical. It includes colours for medical oxygen, nitrous oxide, carbon dioxide, and helium. It has specific colour codes for a range of oxygen mixtures, air for medical applications and breathing use, as well as for specific medical gas mixtures.

BS EN 1089-3 [2] requires that the body of medical gas cylinders shall be coloured white and prohibits the use of a white body on cylinders used in other applications.

The British Compressed Gases Association (BCGA) has supported the use of BS EN 1089-3 [2] and has encouraged its adoption by members. However, as colour coding is not a mandatory legal requirement, gas cylinder owners may have painted their cylinders in a variety of colours. As similar colours are in use in a variety of different applications, for example, medical, industrial, etc. and that not all gas suppliers follow BS EN 1089-3 [2], there is the potential for confusion and a risk of incorrectly identifying the contents of a cylinder.

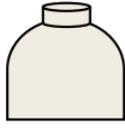
In discussions between the BCGA and the Medicines & Healthcare products Regulatory Agency (MHRA) a proposal for addressing this issue has been agreed.

#### Proposals for painting cylinders

The European Industrial Gas Association (EIGA) has encouraged its members to follow EN 1089-3 [2]. This proposal has been adopted in many EU Member States as the national colour coding requirements for medical gas cylinders. It is proposed that the UK should also formally adopt BS EN 1089-3 [2] to provide the user with a clear distinction between medical and non-medical cylinders.

In compliance with BS EN 1089-3 [2] the body of medical gas cylinders shall be painted white. The contents of a medical gas cylinder shall be identified by the colour coding of the shoulder.

A summary of the changes required within BS EN 1089-3 [2] for medical gases is as follows:

| Product                                 | Old colours            |                  | New colours   |  |                      |
|---|------------------------|------------------|---|--|----------------------|
|   | Shoulder<br>BS 1319C   | Body<br>BS 1319C | Shoulder<br>BS EN 1089-3  |  | Body<br>BS EN 1089-3 |
| Medical Oxygen                          | White                  | Black            |    | White<br>RAL 9010                          | White<br>RAL 9010    |
| Medical Nitrous Oxide                   | Dark Blue              | Dark Blue        |    | Blue<br>RAL 5010                           | White<br>RAL 9010    |
| Medical Air <sup>1</sup>                | Black /<br>White       | French Grey      |    | White<br>RAL 9010<br><br>Black<br>RAL 9005 | White<br>RAL 9010    |
| Medical Carbon Dioxide                  | French Grey            | French Grey      |    | Grey<br>RAL 7037                           | White<br>RAL 9010    |
| Medical Helium                          | Brown                  | Brown            |  | Brown<br>RAL 8008                          | White<br>RAL 9010    |
| Nitrous Oxide /<br>Oxygen <sup>1</sup>  | Dark Blue /<br>White   | Dark Blue        |  | White<br>RAL 9010<br><br>Blue<br>RAL 5010  | White<br>RAL 9010    |
| Carbon Dioxide<br>/ Oxygen <sup>1</sup> | French Grey /<br>White | Black            |  | White<br>RAL 9010<br><br>Grey<br>RAL 7037  | White<br>RAL 9010    |
| Helium /<br>Oxygen <sup>1</sup>         | Brown /<br>White       | Brown            |  | White<br>RAL 9010<br><br>Brown<br>RAL 8008 | White<br>RAL 9010    |

**NOTES:**

1. Where two colours are indicated for the shoulder colour they may be painted in bands or quadrants around the shoulder. It is custom and practice for medical gases to use quadrants.
2. Where valve guards are fitted, if they are colour coded, they should be in accordance with the shoulder colour in the table. Alternatively they may be left unpainted or painted a

different colour provided that it does not conflict with the colour code specified for the cylinder shoulder.

To assist with the identification of the cylinder product, it is proposed that the product name may be displayed down the length of the cylinder, using large lettering. For cylinders up to 140 mm diameter, the lettering used to display the name should be at least 40 mm high and displayed along the axis of the cylinder. For cylinders up to 240 mm diameter, the lettering used to display the name should be at least 60 mm high and displayed either horizontally around the circumference or along the axis of the cylinder.

It is permissible to display the company name on the cylinder but the body of the cylinder shall not be used for promotional material.

### **Proposed conversion programme**

The medical gas industry, having identified the preferred colour coding arrangements for medical gas cylinders, will make arrangements to plan a smooth changeover to white bodies without generating any undue confusion for the customers.

There are a number of issues relating to the rate of conversion which are dependent on the construction of the cylinder. There are three basic types of cylinders in medical gas service. The rationale behind the conversion programme for each is:

#### **(1) Conventional high pressure cylinders**

To change the colour of conventional steel and aluminium alloy cylinders will require the shells to be stripped of their original paint using appropriate processes. This will normally require them to be taken out of service and de-valved. As there are only a limited number of cylinders in service, the only practicable way of achieving this will be to change colours at the time of the next periodic inspection and test (normally ten years).

#### **(2) Lightweight composite hoop-wrapped cylinders**

A significant number of composite hoop-wrapped cylinders have been introduced into medical gas service, especially in the domiciliary sector. These cylinders have carbon or aramid fibre windings around the body of the cylinder and hence cannot be painted directly. The majority of these cylinders are fitted with external protective sleeves that are colour coded. Refitting of the sleeves is a specialised process and can only be carried out when the cylinder is withdrawn for its periodic inspection and test.

#### **(3) Lightweight fully-wrapped cylinders**

The fully-wrapped lightweight cylinder has carbon fibre windings around both ends of the cylinder as well as around the body. These cylinders are painted with colour and then a clear gel or polymer coating is applied to protect the underlying layers. Where these cylinders have a fifteen year service life (on expiry of which they will be scrapped), it is proposed that these cylinders be exempt from any colour coding proposals and allowed to remain with a black body until they are withdrawn from service. Currently they are only used for supplying oxygen in medical gas service and predominantly supplied to Homecare patients as part of an ambulatory package.

As a consequence the conversion will be programmed to run up to the end 2025, with cylinders being painted white when practicable, without affecting customer supply. The rate of conversion will be dependent on the type of cylinder currently being used and the programme adopted by

individual suppliers. During this period of change customers may well receive cylinders coloured in the 'old' way as well as cylinders with white bodies in compliance with this policy.

After 2025, all supplies of medical gas cylinders will be in cylinders with white bodies.

Each supplier will contact their customers to explain how they will carry out this programme of change.

It should be noted that cylinder labelling is the prime method of identifying the contents of all gas cylinders. Labelling will always distinguish clearly between medical and non-medical gases, and this important distinction should be emphasised to all those involved in the use of medical gases.

BCGA Technical Information Sheet 6 [3], *Gas cylinder identification. Label and colour code requirements*, provides a guide to the full range of the colour coding system used to identify gas cylinders and an explanation of some of the content of a gas cylinder label.

### **References:**

1. BS 1319C. Colours for the identification of the contents of medical gas cylinders
2. BS EN 1089. Transportable gas container valves. Gas cylinder identification (excluding LPG) - Part 3: Colour coding.
3. BCGA TIS 6. Gas cylinder identification. Label and colour code requirements.

### **For more information:**

Medicines & Healthcare products Regulatory Agency (MHRA)

[www.mhra.gov.uk](http://www.mhra.gov.uk)

British Compressed Gases Association (BCGA)

[www.bcgaco.uk](http://www.bcgaco.uk)

European Industrial Gases Association (EIGA)

[www.eiga.eu](http://www.eiga.eu)

British Standards Institution (BSI)

[www.bsigroup.co.uk](http://www.bsigroup.co.uk)