



## TECHNICAL INFORMATION SHEET 37

### MEDICAL GASES GAS CYLINDER CLEANLINESS STANDARDS

#### Introduction

Medical gas cylinders are supplied in a clean condition ready for use by healthcare professionals and patients. The user of a gas cylinder has a responsibility to keep the cylinder in a clean condition during use. Prior to its return, the user has to ensure the cylinder is free from contamination before it leaves the medical facility. This document provides guidance on the actions required to keep a cylinder clean and to prevent onward distribution of any contamination that may occur.

The provision of a clean and safe healthcare environment is a major priority for all healthcare organisations. Under the *Health and Social Care Act 2008*, Care Quality Commission (CQC) registration requires that healthcare providers comply with essential standards of quality and safety. Cleaning provides one of the major elements of effective infection prevention and control, promotes patient confidence and demonstrates the existence of a positive safety culture.

Medical gases are commonplace and are used across all areas of healthcare, including hospitals, dental practices, the emergency services as well as being used in remote geographical areas, for example, infectious disease outbreaks or in support of military operations. As such, there is a risk that medical gas cylinders can become externally contaminated.

Unlike many other medicine packages, the majority of medical gas cylinders are supplied on a rental basis. This requires that the user returns each gas cylinder to the gas supplier when empty or when no longer required. Following satisfactory safety checks the cylinders may then be reused.

The gas supplier is responsible for:

- ensuring the gas cylinders are supplied in a suitably clean condition;
- provision to the healthcare provider;
- provision to the homecare patient;
- protection of their staff when gas cylinders are returned to the gas supplier.

The staff at healthcare facilities have a duty of care to ensure that if a cylinder become soiled in use, it is safely cleaned prior to return to the gas supplier or, if it is unable to be cleaned and is left soiled, it is identified as such and packaged with appropriate protection, prior to return.

When cleaning a cylinder it has to be done in such a way that the cylinder is not damaged, the contents are not contaminated and any labels on the cylinder are not defaced.

Where cylinders are contaminated by other than soiling, for example, by oils and greases, the cylinder should be removed from service, quarantined and the advice of the gas supplier obtained.

### **Materials**

Medical gas cylinders have traditionally been manufactured from steel, but improvements in technology enabled the introduction of aluminium alloy cylinders and cylinders of composite construction (wrapped with carbon fibre with a resin coating). Cylinders are either painted or covered with a sleeve to provide protection. Cylinder valves are mainly manufactured from brass. Some cleaning chemicals can adversely react and cause damage to these materials.

Labels are typically printed on vinyl with an outer surface that acts as a filter to reduce fading. Over-cleaning may impact the label surface and can remove information making them illegible.

### **Cylinders in use**

It is expected that the user will keep gas cylinders in a reasonably clean condition. “*Medical gas and suction equipment including gas cylinder holder*” are identified as a scored element required to be included in the risk assessment when determining the cleaning standards for a medical facility, refer to (Publicly Available Specification) PAS 5748, *Specification for the planning, application, measurement and review of cleanliness services in hospitals*. The National Patient Safety Agency (NPSA) document - *National Specification for Cleanliness in the NHS*, identifies medical gas equipment as a key element for maintaining cleanliness and requires that “*All parts (including underneath) should be visibly clean, with no blood or body substances, dust, dirt, debris or spillages.*”

In use, contact with blood or other bodily fluids should be avoided. If a gas cylinder becomes soiled, the user should ensure that it is cleaned before further use or being returned to the gas supplier. Refer to ‘Cleaning - Normal use’.

Where a cylinder is used in an area where there is a risk of contamination from a notified infectious disease (typically this will be a managed quarantined area) then the user has a duty to ensure the cylinder is decontaminated to an acceptable standard before it is allowed to leave the controlled area. Refer to ‘Cleaning – Specialist use’.

### **Cleaning – Normal use**

If the cylinder has been soiled, the preferred method of cleaning is:

- use hot water not exceeding 50 °C, to first remove the foreign matter; then
- use Iso Propyl Alcohol (IPA) wipes.

If the user is not able to ‘clean’ the cylinder then they should contact the gas supplier and agree an appropriate and safe way to return the cylinder.

As necessary, quarantine cylinders which require additional cleaning and apply appropriate warning notices.

### **NOTES:**

- 1) Iso Propyl Alcohol in liquid solution should not be used due to the increased fire risk, excessive use may also represent a potential health risk.
- 2) The cylinder is not to be immersed in water.

- 3) Care should be taken to avoid cleaning fluids entering or remaining inside the valves. The valves should be protected (for example, by the fitting of blanks, caps, covers, etc.) during the cylinder cleaning process to avoid internal damage to the valve.

The cleaning method should not have a detrimental effect on the external surfaces of the cylinder or valve. Cleaning materials containing ammonia, amine or chlorine based compounds (such as bleach), other than potable water, shall not be used. These can cause the corrosion of steel or aluminium alloy components and cause stress corrosion cracking of brass components. They also have the potential to contaminate an 'oxygen clean' system. When being cleaned with potable water ensure excess water is removed and all surfaces are dry before further use.

Care is required to ensure that any product labels on the cylinder are not damaged or removed during the cleaning process.

Further information is available in the European Industrial Gases Association (EIGA) Technical Bulletin 03, *Handling and cleaning externally soiled medicinal gas containers*.

### **Cleaning – Specialist use**

Where a cylinder is used (inside a controlled area) where there is a risk of contamination from a notified infectious disease, the user has a responsibility to ensure that any contamination from the notified infectious disease is removed before the cylinder leaves the controlled area.

The decontamination team at the controlled area may use specialist cleaning chemicals, which may include disinfectants, to decontaminate the cylinder.

NOTE: Some of these chemicals may not be compatible with the materials used in the construction of the gas cylinder and valve. Some of the chemicals used are known to be chemically aggressive with materials, such as brass.

On completion of the decontamination process the Authorities (who are in charge of the controlled area) shall provide assurance that the gas cylinder has been decontaminated and that there is no further risk from the notified infectious disease. The user should obtain a 'Certificate of Cleanliness' from the Authorities. The user should determine from the Authorities which chemicals have been used for decontamination. Where decontamination has been carried out using specialist chemicals the user should inform the gas supplier of which chemicals have been used on which specific cylinder(s).

After a specialist cleaning chemical has been used, additional cleaning processes should be carried out, for example, hot water, detergent cleaning and rinsing.

For BCGA members, further information is available in BCGA Guidance Note 24, *The distribution, handling and cleaning of gas containers in a biosecurity environment*.

The user should contact the gas supplier if there is any doubt concerning the method used to clean the cylinder.

### **Returning cylinders**

Where a cylinder has been soiled during use and subsequently cleaned, the user should report this to the gas supplier.

Where a cylinder has been in a controlled area where a notified infectious disease was present, the user should return the cylinder with a 'Certificate of Cleanliness' and provide information on any specialist chemicals used during the decontamination process.

Where cleaning may not have been possible, or may not have been to the required level of cleanliness, then an alternative method of returning a cylinder can be agreed between the user and the gas supplier. This could include, for example, sealing the cylinder in a plastic bag (which are available from the gas supplier) and adding an appropriate warning label(s).

Cylinders identified as being contaminated, shall be kept separate from other cylinders, until appropriate cleaning has taken place. This will prevent cross-contamination occurring.

Knowing that a cylinder has been cleaned and which chemicals have been used, allows the gas supplier to assess the cylinder to determine if it remains safe for continued service.

Gas suppliers' drivers and homecare service personnel shall receive appropriate information, instruction and training on how to handle soiled cylinders, including the use of appropriate personal protective equipment, (for example, gloves).

**For more information:**

UK Legislation

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

Care Quality Commission (CQC)

[www.cqc.org.uk](http://www.cqc.org.uk)

British Standards Institute (BSI)

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