



TECHNICAL INFORMATION SHEET 36 - 2017

MEDICAL GASES. THE SAFE HANDLING AND USE OF GAS CYLINDERS FITTED WITH VALVES WITH INTEGRATED PRESSURE REGULATORS

Background

Anyone required to handle and use medical gas cylinders should have an understanding of how to do so safely and are to have received appropriate training. For patients at home the training is normally provided by the Homecare oxygen provider. In a healthcare facility environment it is the responsibility of the employer to ensure that their staff have the appropriate training and can operate the equipment correctly and safely. This should include specific training in fire prevention. Whilst oxygen is not flammable, it does support combustion, and where high concentrations of oxygen may be present the consequences of a fire can be devastating to both staff, patients and third parties.

Medical oxygen gas cylinders are predominantly fitted with a valve with an integrated pressure regulator making it a safer and easier method for administering gas to the end user. This type of valve is increasingly being fitted to cylinders containing other medical gases. This enables gas to be delivered to the patient without having to connect an additional pressure regulator to the gas cylinder, therefore avoiding the need for the user having to make a high pressure gas connection to the cylinder.

The valves on these gas cylinders comply with standards such as BS EN ISO 10524, Part 3, *Pressure regulators for use with medical gases. Pressure regulators integrated with cylinder valves.*

The standard allows for two types of valve to be used. Either you will have a valve that has a separate on/off valve and flow selector, or a valve that combines the on/off valve and flow selector in a single control mechanism. Understand which option is fitted and follow your gas suppliers' instructions for the safe use of the cylinder.

This guidance details best practice for using and handling gas cylinders fitted with an integrated pressure regulator and its associated equipment safely.

The guidance below should be followed:

1. **WARNING:** Do not smoke or use naked flames near medical gases.



2. Ensure that medical gas cylinders are kept free of oils or greases.

When handling gas cylinders ensure your hands are clean.

If you have used an alcohol gel on your hands, make sure that it has fully evaporated before handling the cylinder.

When creams are necessary, only use approved water based creams.



3. Check you have the correct medical gas for the patient; read the label and take heed of the safety information.

If you require additional information ask your healthcare professional for the patient information leaflet and/or contact the gas supplier.



4. Ensure that the gas within the cylinder is within its expiry date; this is detailed on the batch label. Always use the cylinder with the earliest expiry date first.



5. Check there is sufficient gas in the cylinder for the required therapy by checking the contents gauge.



6. If the cylinder is less than a quarter full, consider replacing with a full cylinder.

If a patient is being transferred check there is sufficient gas for the whole journey (allowing for changes in patient demand and possible delays). Have spare cylinders available, as necessary.



7. Medical gas cylinders are fitted with a tamper evident seal to indicate that the cylinder has not been used.

When using the cylinder for the first time, check the tamper evident seal is intact. If the tamper evident seal is not intact do not use the cylinder and contact your gas supplier for further advice.

Before use remove the tamper evident seal.



8a. Ensure the flow selector is set to zero before opening the valve or connecting any equipment.



8b. Where the flow selector is integrated with the shut-off valve ensure it is selected to the off position.

9. Remove any protection cap, or open any fixed cover from the outlet connection.

Ensure the outlets are free from any contamination.

If there is evidence of contamination do not use.

Option 1 – Tube connection

If using the flow outlet, connect the tubing to the fir tree outlet, making sure that it is securely fitted.

Option 2 – Probe connection

If using the Schrader outlet, insert the probe into the outlet and check that it is securely fitted.

NOTE: When engaged a ‘click’ will be heard.



10. Open the valve slowly.

Ideally the cylinder should be held upright while the valve is opened, with the valve outlet pointing away from people and soft-furnishing, such as bedding.



11a. Option 1 – Tube connection

Select the prescribed flow on the flow selector. Check there is a flow of gas from the end of the tubing.



11b. Option 2 – Probe connection

Check for leaks. Listen for a hissing sound whilst the gas is flowing.

If there is a leak, close the valve, allow any excess gas to vent.

If the leak seems to originate from the cylinder or valve, stop using and contact the gas supplier.

If the leak is from the equipment, remove, check for damage, replace as necessary, then refit the equipment. Check for leaks before use.



12. To prevent cylinders from falling over always place them in an appropriate position, where available use an appropriately designed holder or trolley.

In a homecare environment it is acceptable to lie cylinders on the floor – taking care to prevent a trip hazard, for example, by positioning close to a wall.



13. When using with a patient in a bed in a healthcare facility, the cylinder should be secured in an upright position next to the bed.

It is advisable not to place the cylinder on the bed near the patient. If there is no alternative, then make sure that the cylinder is opened and checked for leaks before placing on the bed.



14. Whilst the cylinder is in use ensure that the gas is flowing; monitor the condition of the patient.

Check the contents gauge periodically to ensure there is sufficient gas for the therapy.



15. If you need to temporarily remove the mask or cannula, even for a short period of time, turn the flow selector to 0 or off.

16. When a supply of medical gas is no longer required for the patient or when the cylinder is empty, remove the equipment from the patient before disconnecting and removing or replacing the cylinder.

For a replacement cylinder repeat steps 3 to 14.

17a. Option 1 – Tube connection

For temporary removal the equipment may remain connected.

When treatment is no longer required remove the equipment, unless it is required for emergency use.

When the cylinder is empty, close the cylinder valve. Always close the valve slowly, do not use excessive force.

Allow time for the equipment to vent.

Turn the flow selector to 0 or off. Replace any protective caps provided for the valve outlet.



17b. Option 2 – Probe connection

When not in use or when the cylinder is empty, close the cylinder valve. Always close the valve slowly, do not use excessive force.

Momentarily open the flow selector to allow any residual gas to vent and then remove the Schrader probe. Replace any protective caps provided for the valve outlet.



18. Check the contents gauge.

Assess if the cylinder contains sufficient gas for further use.

As necessary, replace the cylinder. Return empty cylinders to your store for replacement by the gas supplier.



19. If a fault is identified with the gas cylinder or valve assembly:

- Remove the cylinder from use;
- Store separately from other cylinders;
- Label (indicating the suspected fault);
- Contact the gas supplier.

NOTE: The gas supplier may require details such as the bar code number, batch number and a description of the suspected fault.

For more information:

British Standards Institute (BSI)

British Compressed Gases Association (BCGA)

Medicines & Healthcare products Regulatory Agency (MHRA)

www.bsigroup.co.uk

www.bcgaco.uk

www.mhra.gov.uk

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