

## Pressure Testing of Medical Gas Cylinders

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To whom it may concern,

Baywater Healthcare own and operate cylinders used to supply industrial, medical and speciality gases. Cylinder construction and manufacture meet both European and National standards applicable to the construction of each different package type. Baywater Healthcare purchasing policy ensures that new cylinder asset is purchased to approved standards of construction which comply with and meet the requirements of both 'ADR' (European agreement concerning the international carriage of dangerous goods by road) and National legislation – CDG (The carriage of dangerous goods and use of transportable pressure equipment regulation) Recent years have seen changes to construction standards resulting in standardisation and harmonisation of manufacturing standards allowing cylinder construction to meet European and international standards.

### Manufacturing standards

BS EN 1964-1 – Transportable gas cylinders – Specification for seamless steel gas containers above 0.5 litre water capacity

BS EN 13322-1 – Transportable gas cylinders – Specification for welded steel containers

BS EN 9809 – Transportable gas cylinders – Specification for the design and construction of refillable transportable seamless steel gas cylinders of water capacity from 0.5 litre up to and including 150 litres

84/525/EEC – Council directive on the approximation of the laws of the member states relating to seamless steel gas cylinders

BS EN 7866 – Refillable seamless aluminium alloy gas cylinders

BS EN 12257 2002 – Transportable gas cylinders – Seamless hoop wrapped composite cylinders

EN 12245 – Transportable gas cylinders – Fully wrapped composite cylinders

Materials used to manufacture seamless gas cylinders are specified in manufacturing standards, these are special steels or alloys which are subject to special heat treatment and quenching to obtain specific tensile material strength. Material specifications are dependent on type approval for the cylinder under construction and are strictly controlled during the manufacturing process. During the service life of a gas cylinder it is subjected to periodic inspection and retest at pre-defined intervals. This is carried out in accordance with the relevant EN standard at UKAS/DFT approved test stations.

## Listed below are the standards used as reference to requalify gas cylinders

BS EN 1968 2002 - Transportable gas cylinders - Period inspection and testing of seamless steel gas cylinders

BS EN ISO 11623 - Transportable gas cylinders - Periodic inspection and testing of composite gas cylinders

BS EN 1802 2002 - Transportable gas cylinders - Periodic inspection and testing of seamless aluminium alloy gas cylinders

BS EN 1803 2002 - Transportable gas cylinders - Periodic inspection and testing of welded carbon steel gas cylinders

Once introduced into service cylinders are subject to in-service pre-fill inspection prior to filling. Inspection and re-test is carried out at intervals specified in the relevant BS EN standard and is dependent on the vessel type. All high pressure cylinders are fit for continued operation so long as they are tested in accordance with the relevant standard and pass the period inspection and test. Cylinders are stamp-marked with the periodic inspection date and a coloured plastic ring fixed under the cylinder valve to indicate the next inspection date.

Provided the cylinder has been subjected to normal conditions of use and has not been subjected to abusive and abnormal conditions rendering the cylinder unsafe, there is no general requirement for the user to return a gas cylinder before the contents have been used even though the test interval may have lapsed. However it is recommended that cylinders are retested within a period not exceeding twice the time interval.

Normally standard type cylinders are not subject to a limited life period and can be used indefinitely; some specialist cylinders are subject to a limited life period and are controlled and removed from service at the time of inspection and retest.

With respect to medical gases including oxygen, all our medical gases have a three year expiry date and the minimum retest period for any cylinder or valve is five years. Cylinders can be refilled up until their retest date and should not be used more than one test period beyond the retest date. This means that any cylinder filled prior to its retest date would have a minimum period of use of at least five years. In consequence the gas in the cylinder would have passed its three year expiry date well before the recommended cylinder or valve test expiry date.

Yours faithfully,



**Dr Nigel Shepperson**

Director of Regulatory Affairs