



TECHNICAL INFORMATION SHEET 28

NON-REFILLABLE CYLINDERS

1. Introduction

Non-refillable cylinders are widely used in the United Kingdom (UK) and Europe. They are lightweight, portable and easy to use.

Non-refillable cylinders are used to supply a range of gases and are common, for example, in the gas detection, calibration, welding and refrigerant markets.

Non-refillable cylinders are manufactured in Great Britain (GB) and Europe as well as in other parts of the world. Once filled with a gas they are classified as Class 2, dangerous goods.

In order to be placed on the market within GB they are required to comply with the *Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations* ^[1], which implement the *Agreement concerning the International Carriage of Dangerous Goods by Road* (ADR) ^[2].

To be placed on the market in Europe they have to comply with ADR ^[2] and also the *Transportable Pressure Equipment Directive* (TPED) ^[3]. Conformity assessment is required by a European Notified Body.

Shippers and users of non-refillable cylinders have a legal responsibility to ensure that all non-refillable cylinders are compliant with the relevant legislation and that each cylinder assembly is identified with the appropriate conformity mark(s).

2. Technical information

All products identified as dangerous goods which are transported by road throughout the UK and Europe are governed by rules detailed in ADR ^[2].

ADR ^[2], Section 6.2.2.1, covers the design, construction and initial inspection and test requirements for UN cylinders.

ADR ^[2], Section 6.2.3, provides similar requirements for non-UN cylinders.

In both cases the standard listed for non-refillable cylinders is ISO 11118 ^[6], *Gas Cylinders. Non-refillable metallic gas cylinders. Specification and test methods*.

ISO 11118 ^[6], Section 8.1.2, requires that the cylinder shall be equipped with a device rendering the cylinder non-refillable. This can be accomplished by a valve or a pierceable metal membrane that is permanently attached to the neck opening which, when in place, renders the cylinder non-refillable. Replaceable sealing devices shall not be used.

ADR ^[2], Section 6.2.2.8, requires that non-refillable cylinders are permanently marked, clearly and legibly, with certification and gas or pressure receptacle specific marks. This includes 'DO NOT REFILL' at a minimum 5 mm height.

ISO 11118 ^[6], Section 6, requires that each non-refillable cylinder shall be subject to inspection and testing by an inspection body authorized to do so.

ADR ^[2] requires that each non-refillable cylinder shall be subject to conformity assessment.

CAUTION: There are cylinders provided for similar applications which are manufactured, for example, to ISO 7866 ^[4], *Gas cylinders. Refillable seamless aluminium alloy gas cylinders. Design, construction and testing*. Where cylinders are provided for refilling, they shall be fitted with a valve manufactured to a standard suitable for refilling as specified in ADR ^[2] (Section 6.2.2.3 or 6.2.4.1, as appropriate). Conformity assessment shall be required as a refillable cylinder. Refillable cylinders shall not be fitted with a non-refillable valve. Non-refillable cylinders shall not be fitted with a refillable valve.

3. Summary of transport legislation

Non-refillable cylinders have to comply with ADR ^[2]. This requires compliance with ISO 11118 ^[6]. Each cylinder shall require conformity assessment in the geographical area where it is placed on the market.

If a cylinder(s) is delivered to your premises and then re-shipped by you, then you are liable for ensuring that the type approved package meets all of the requirements of ADR ^[2] and is compliant with the conformity assessment requirements of the geographical area where the package will be placed on the market.

4. Use

Non-refillable cylinders are used in a similar way to refillable cylinders, the same handling, connection, operational and safety procedures apply to all gas cylinders.

ADR ^[2], Section 4.1.6.9, requires that non-refillable pressure receptacles shall:

- be carried in an outer packaging, such as a box or a crate, or in shrink-wrapped or stretch-wrapped trays;
- when filled with a flammable or toxic gas (as classified for transport in ADR ^[2]), be of a water capacity of less than or equal to 1.25 litres;
- not be used for (very) toxic gases with an LC₅₀ of less than or equal to 200 ml/m³ (ppm);
- not be repaired after being put in service.

NOTE: BS ISO 10298 ^[5], *Gas cylinders. Gases and gas mixtures. Determination of toxicity for the selection of cylinder valve outlets*, defines gases with an LC₅₀ of less than or equal to 200 ml/m³ (ppm) as 'very toxic'.

Information on the contents of the cylinder will be displayed on the product contents label and the supplier has to ensure that the end-user is supplied with a safety data sheet. BCGA publishes many Codes of Practice and other guidance to assist the user with the safe use of cylinders. The end-user should make themselves familiar with all this information.

Under no circumstances shall any attempt be made to refill a non-refillable cylinder.

5. Disposal

Unless there is an arrangement in-place to return a non-refillable cylinder back to the supplier, the user shall have the obligation for safely and legally disposing of each cylinder.

Before a non-refillable cylinder can be disposed of it shall be emptied of its gas content. Venting of the residual contents shall be carried out safely, taking appropriate care to ensure that injury to personnel or damage to the environment cannot occur. BCGA Leaflet 2 ^[7] *The safe handling of gas containers at waste facilities*, provides information on how to make cylinders safe to enter the waste stream.

The materials used to manufacture non-refillable cylinders are usually recyclable, they should be disposed of responsibly at a licenced waste management facility, refer to the safety data sheet.

Non-refillable cylinders should not be disposed of in general waste.

References:

1. SI 2009, No. 1348, The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (as amended). Specific reference shall be made to SI 2020, No 1111, The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment (Amendment) (EU Exit) Regulations 2020.
2. Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) (as amended).
3. European Directive 2010/35/EU, the Transportable Pressure Equipment Directive (TPED).
4. BS EN ISO 7866, Gas cylinders. Refillable seamless aluminium alloy gas cylinders. Design, construction and testing.
5. BS ISO 10298, Gas cylinders. Gases and gas mixtures. Determination of toxicity for the selection of cylinder valve outlets.
6. BS EN ISO 11118: 2015 & Amdt 1: 2020, Gas cylinders. Non-refillable metallic gas cylinders. Specification and test methods.
7. BCGA Leaflet 2, The safe handling of gas containers at waste facilities.

For more information:

British Standards Institute (BSI)
British Compressed Gases Association (BCGA)

www.bsigroup.co.uk
www.bcgaco.uk