

Transportable gas cylinders — Cylinder valves — Specification and type testing

The European Standard EN 849:1996, with the incorporation of amendments A1:1999 and A2:2001, has the status of a British Standard

ICS 23.060.40

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PVE/3, Gas containers, upon which the following bodies were represented:

- Aluminium Extruders' Association
- Aluminium Federation
- British Compressed Gases Association
- British Fire Consortium
- British Gas plc
- British Iron and Steel Producers' Association
- British Soft Drinks Association Ltd.
- Engineering Equipment and Materials Users' Association
- Fire Extinguishing Trades Association
- Health and Safety Executive
- Home Office
- Institution of Chemical Engineers
- LP Gas Association
- Marine Safety Agency
- Ministry of Defence
- National Engineering Laboratory
- National Physical Laboratory
- Safety Assessment Federation Ltd.
- Safety Equipment Association
- Tube Investments Chesterfield Tube Co. Ltd.
- Tubes Investments Limited

The following bodies were also represented in the drafting of the standard, through sub-committees and panels:

- British Association of Breathing Apparatus Service Engineers
- Department of Health

This British Standard, having been prepared under the direction of the Engineering Sector Board, was published under the authority of the Standards Board and comes into effect on 15 March 1997

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Amendments issued since publication

Amd. No.	Date	Comments
10588	November 1999	Addition of new Annex C
13345	14 January 2002	Indicated by a sideline

The following BSI references relate to the work on this standard:
Committee reference PVE/3
Draft for comment 92/812941 X

ISBN 0 580 26783 0

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National foreword

This British Standard has been prepared by Technical Committee PVE/3 and is the English language version of EN 849:1996 *Transportable gas cylinders — Cylinder valves — Specification and type testing*, including amendments A1:1999 and A2:2001, published by the European Committee for Standardization (CEN).

EN 849 was produced as a result of international discussions in which the United Kingdom took an active part.

This British Standard partially supersedes BS 341-1:1962, BS 341-1:1991 and BS 341-2:1963 which will be amended to eliminate conflicting requirements.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

The Technical Committee has reviewed the provisions of ISO 5145:1990 to which normative reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 24, an inside back cover and a back cover.

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Sidelining in this document indicates the most recent changes by amendment

Descriptors: Gas cylinders, compressed gases, liquified gases, dissolved gases, gas valves, design, performance evaluation, conformity tests, marking

English version

Transportable gas cylinders — Cylinder valves — Specification and type testing

(includes amendments A1:1999 and A2:2001)

Bouteilles à gaz transportables — Robinets de
bouteilles — Spécifications et essais de type
(inclut les amendements A1:1999 et A2:2001)

Ortsbewegliche Gasflaschen —
Flaschen-Ventile — Spezifikation und
Typprüfung
(enthält Änderungen A1:1999 und A2:2001)

This European Standard was approved by CEN on 1996-01-22; amendment A1 was approved by CEN on 1999-01-08. Amendment A2:2001 was approved by CEN on 2001-05-10. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 23, Transportable gas cylinders, the Secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 1997, and conflicting national standards shall be withdrawn at the latest by January 1997.

This European Standard has been submitted for reference into the RID and/or the technical annexes of the ADR. Therefore in this context the standards listed in the normative references and covering basic requirements of the RID/ADR not addressed within the present standard are normative only when the standards themselves are referred to in the RID and/or the technical annexes of the ADR.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Foreword to amendment A1

This amendment EN 849:1996/A1:1999 to EN 849:1996 has been prepared by Technical Committee CEN/TC 23, Transportable gas cylinders, the Secretariat of which is held by BSI.

This amendment to the European Standard EN 849:1996 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 1999, and conflicting national standards shall be withdrawn at the latest by October 1999.

This amendment to EN 849 has been prepared to clarify certain important parameters and aspects of testing cylinder valves in accordance with EN 849, 5.4.4.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This European Standard has been submitted for reference into the RID and/or the technical annexes of the ADR. Therefore in this context the standards listed in the normative references and covering basic requirements of the RID/ADR not addressed within the present standard are normative only when the standards themselves are referred to in the RID and/or the technical annexes of the ADR.

Foreword to amendment A2

This amendment EN 849:1996/A2:2001 to EN 849:1996 has been prepared by Technical Committee CEN/TC 23, Transportable gas cylinders, the Secretariat of which is held by BSI.

This amendment to the European Standard EN 849:1996 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2001, and conflicting national standards shall be withdrawn at the latest by December 2001.

This amendment to EN 849 has been prepared to align certain requirements with RID/ADR.

This European Standard has been submitted for reference into the RID and/or the technical annexes of the ADR. Therefore in this context the standards listed in the normative references and covering basic requirements of the RID/ADR not addressed within the present standard are normative only when the standards themselves are referred to in the RID and/or the technical annexes of the ADR.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

The increased use of compressed gases has led to a corresponding increase in the number of gas cylinders that are in circulation throughout the world.

Each gas cylinder is fitted with a valve, to contain and control the discharge of its contents.

Such valves normally conform to standards of performance and safety.

1 Scope

This European Standard specifies requirements for gas cylinder valves and the method of testing such valves, for type approval.

This standard is applicable to valves to be fitted to gas cylinders, up to 150 l water capacity, intended to convey compressed, liquefied or dissolved gases.

This standard is only applicable to valves operated by a hand wheel or a key.

This standard is not applicable to valves for breathing equipment, fire extinguishers or cryogenic equipment.

This standard is primarily for industrial gases other than LPG but may also be applied for LPG. However for dedicated LPG cylinders, see prEN 13153:1998, *Specification and testing for Liquefied Petroleum Gases (LPG) — Cylinder valves — Manually operated*, prepared by CEN/TC 286, *Liquefied petroleum gas equipment and accessories*.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate place in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 629-1, *Transportable gas cylinders — 25E taper thread for connection of valves to gas cylinders — Part 1: Specification*.

EN 720-2, *Transportable gas cylinders — Gases and gas mixtures — Part 2: Determination of flammability and oxidizing ability of gases and gas mixtures*.

EN 962, *Transportable gas cylinders — Valve protection caps and valve guards for industrial and medical gas cylinders — Design, construction and tests*.

ISO 188, *Rubber, vulcanized — Accelerated ageing or heat-resistance tests*.

ISO 1817, *Rubber, vulcanized — Determination of the effect of liquids*.

ISO 5145:1990, *Cylinder valve outlets for gases and gas mixtures — Selection and dimensioning*.

3 Definitions and symbols

For the purposes of this standard, the following definitions and symbols apply.

3.1

working pressure (p_w)

settled pressure, at a uniform temperature of 15 °C, for a full gas cylinder

3.2

operating pressure (p_o)

varying pressure which is developed in a cylinder during service

3.3

valve test pressure (p_{vt})

for compressed gases:

$$p_{vt} = 1,2 \times p_w$$

for liquefied gases and dissolved gases under pressure (for example, acetylene): p_{vt} shall be at least equal to the minimum test pressure of the cylinder quoted in the relevant transport regulation for that gas or gas group

3.4**external tightness**

tightness to atmosphere (leakage in and/or leakage out) when the valve is open (see Figure 1)

3.5**internal tightness**

tightness across the valve seat (leakage in and/or leakage out) when the valve is closed (see Figure 2)

3.6**minimum closing torque (T_c)**

minimum closing torque necessary to obtain the internal tightness

3.7**resistance torque**

maximum closing torque the valve can withstand without damage

3.8**valve operating mechanism**

manually rotated device, which closes and opens the valve orifice

4 Valve requirements**4.1 General**

Valves shall operate satisfactorily over the full range of service temperatures, normally from $-20\text{ }^{\circ}\text{C}$ to $+65\text{ }^{\circ}\text{C}$. The range may be extended for short periods (e.g. during filling). Where higher or lower service temperatures are required for longer periods, the purchaser shall specify accordingly.

Valves shall be capable of withstanding the mechanical stresses or chemical attack they may experience during normal service.

Valves shall be cleaned to meet the requirements of the intended service.

4.2 Description and dimensions

A cylinder valve comprises:

- a body;
- a valve operating mechanism and internal sealing device;
- an external sealing mechanism;
- a connection(s) for usage (fill and discharge);
- a connection system, between the valve and gas cylinder;

and occasionally:

- a safety device, against overpressurization;
- a siphon tube;
- a screwed plug or cap, on the outlet connection, to ensure leak tightness or protection;
- an excess flow limiting device.

The bore of the valve shall be adequate to meet the requirements of flow rate, without unacceptably reducing the strength of the stem connection. The bore diameter, typically 3,5 mm for valves with a 25E stem thread (see EN 629-1) and 2 mm for valves with a 17E stem thread, shall be agreed between customer and supplier.

Where a valve is to be protected by a cap in accordance with EN 962 the valve should comply with the dimensions given in Figure 3.