SLOVENSKI STANDARD
SIST EN 849:1999

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Plinske jeklenke - Ventili za jeklenke - Specifikacije in tipski preskus

Transportable gas cylinders - Cylinder valves - Specification and type testing

Ortsbewegliche Gasflaschen - Flaschen-Ventile - Spezifikation und Typprüfung

Bouteilles a gaz transportables - Robinets de bouteilles - Spécifications et essais de type

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23.020.30	Tlačne posode, plinske jeklenke	Pressure vessels, gas cylinders
23.060.40	Tlačni regulatorji	Pressure regulators

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English version

Transportable gas cylinders - Cylinder valves - Specification and type testing

Bouteilles à gaz transportables - Robinets de bouteilles - Spécifications et essais de type

Ortsbewegliche Gasflaschen - Flaschen-Ventile - Spezifikation und Typprüfung

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CEN

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

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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of an identical text or by endorsement, at the latest by January 1997, and conflicting national standards shall be withdrawn at the latest by January 1997.

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.

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, cryogenic equipment or liquefied petroleum gas (LPG).

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 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.

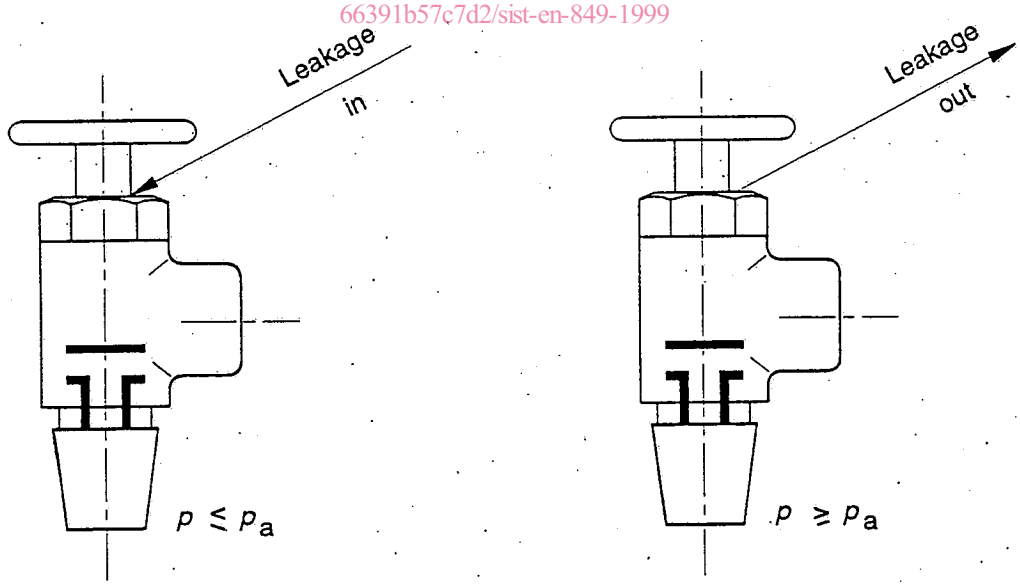
3.3 valve test pressure (p_{vt}): For permanent gases:

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

For liquefied gases and dissolved gases under pressure (for example, acetylene):

p_{vt} = test pressure, of the cylinders, to which the valves will be fitted.

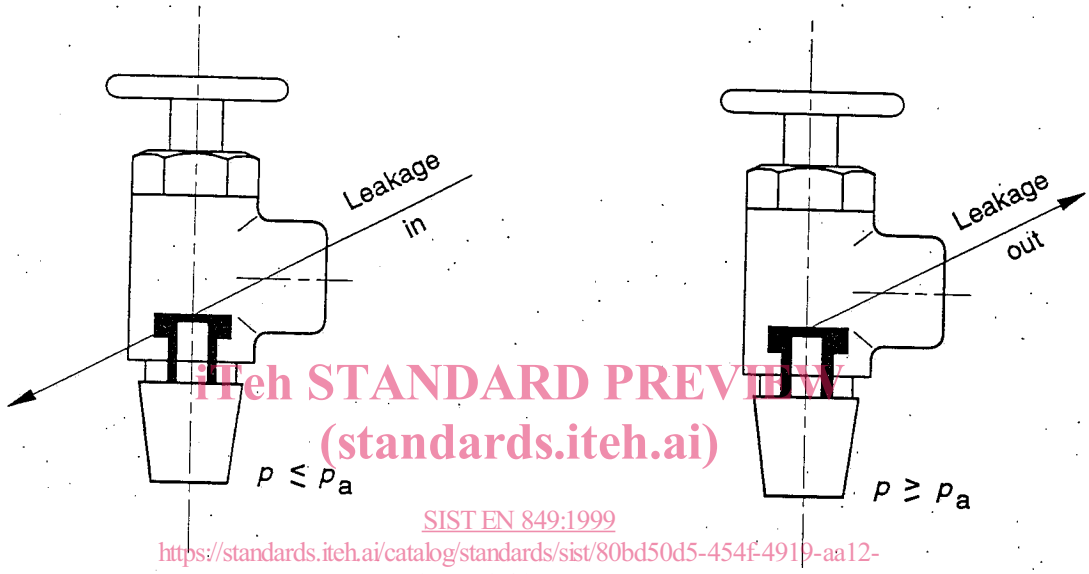
3.4 external tightness: Tightness to atmosphere (leakage in and/or leakage out) when the valve is open (see figure 1).



- p = internal pressure;
- p_a = atmospheric pressure

Figure 1 : External tightness

3.5 internal tightness: Tightness across the valve seat (leakage in and/or leakage out) when the valve is closed (see figure 2).



- p = internal pressure;
- p_a = atmospheric pressure

Figure 2 : Internal tightness

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°C to +65°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;

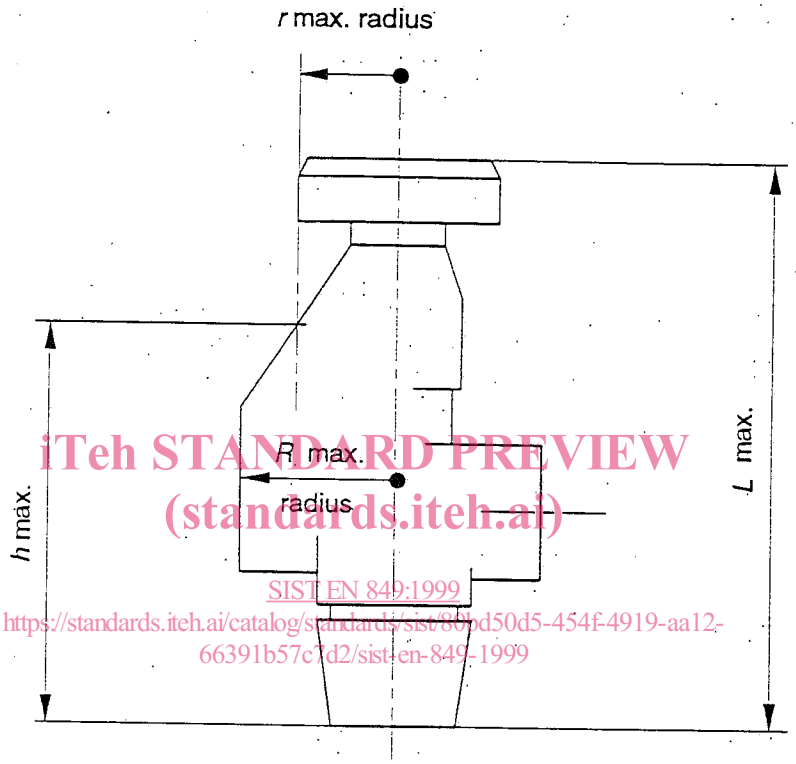
- an external sealing mechanism;
- a connection(s) for usage (fill and discharge);
- a connection system, between the valve and gas cylinder;

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.



r ≤ 32,5 mm	h ≤ 90 mm
R ≤ 38 mm	L ≤ 125 mm

NOTE : "h" represents the length of the lower part of the valve, when the maximum radius is greater than the radius of the handwheel

Figure 3 : Maximum dimensions for gas cylinder valves, protected by a cap

4.3 Materials

Metallic and non-metallic materials in contact with the gas shall be chemically and/or physically compatible with the gas, under all intended operating conditions.

Compatibility of materials with oxygen and other oxidizing gases, ignition resistance of materials and lubricants, shall be established by an appropriate test procedure.

Valves for acetylene may be manufactured from copper based alloys if the copper content does not exceed 70% (by weight). The manufacturer shall not use any procedure resulting in copper enrichment of the surface. Silver content of alloys shall be limited for acetylene valves. The acceptable limit varies between 43% (by weight) and 50% (by weight), depending on the composition of the alloy.

Non-metallic sealing material for use with air, oxygen and oxygen enriched gases, shall be capable of withstanding an ageing sensitivity test in accordance with ISO 188.

Non-metallic sealing material in valves shall be capable of withstanding corrosive media tests in accordance with ISO 1817.

4.4 Design and construction

4.4.1 *Valve body*

The valve body shall be manufactured by a process that will ensure the reproducibility of the mechanical characteristics necessary to meet the requirements specified in this standard, particularly that specified in 5.4.2. The anisotropy of the material shall be considered.

4.4.2 *Valve connections*

Valves are normally connected to the cylinder by means of a taper or parallel male thread and to the filling and utilisation appliances by means of a separate outlet connection, complying with an accepted standard.

4.4.3 *Valve operating mechanism*

The valve operating mechanism shall be manufactured from materials capable of withstanding mechanical stress including possible dynamic loads (for example, pressure shocks or cyclic changes) and the extremes of service temperature, to which it may be subjected.

The materials of the valve operating mechanism shall withstand fire engulfment in accordance with 5.4.10.

The valve operating mechanism shall satisfy the following conditions:

- it shall not be dependent on the pressure in the cylinder;

- it shall, under normal conditions operate without difficulty throughout its service life;

- it shall be designed in such a way that it cannot be unscrewed from the valve body with a torque less than 40 N.m;