



SLOVENSKI STANDARD SIST EN 1800:2007

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Transportable gas cylinders - Acetylene cylinders - Basic requirements, definitions and type testing

Ortsbewegliche Gasflaschen - Acetylenflaschen - Grundanforderungen, Definitionen und Typprüfung

Bouteilles a gaz transportables - Bouteilles d'acetylene - Exigences fondamentales, définitions et essais de type

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Ta slovenski standard je istoveten z: EN 1800:2006

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English Version

Transportable gas cylinders - Acetylene cylinders - Basic requirements, definitions and type testing

Bouteilles à gaz transportables - Bouteilles d'acétylène -
Exigences fondamentales, définitions et essais de type

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Grundanforderungen, Definitionen und Typprüfung

This European Standard was approved by CEN on 29 September 2006.

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.

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CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 1800:2006) 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 May 2007, and conflicting national standards shall be withdrawn at the latest by May 2007.

This European Standard has been submitted for reference into the RID and/or in 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 in the technical annexes of the ADR.

This document supersedes EN 1800:1998.

This revision has been prepared to:

- a) introduce a new subclause 4.2.4 to cover requirements for joggle welds in welded cylinders;
- b) bring the normative references up to date;
- c) bring the editorial style up to date including the correction of a hanging clause under Clause 5 with consequent renumbering of subsequent sub-clauses;
- d) add a reference to welded steel cylinders, EN 13322-1;
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- e) make the figures language independent.

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

1 Scope

This European Standard specifies the basic requirements for acetylene cylinders with a maximum nominal water capacity of 150 l, including:

- a) the procedure for type testing;
- b) the procedure for production/batch testing;
- c) the methods for determining the maximum permissible settled pressure;
- d) the method for determining the porosity of the porous material;

It does not include details of designs for the cylinder shell.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1964-1, *Transportable gas cylinders — Specification for the design and construction of refillable transportable seamless steel gas cylinders of water capacities from 0,5 litre up to and including 150 litres — Part 1: Cylinders made from seamless steel with an R_m value of less than 1 100 MPa*

EN 1975, *Transportable gas cylinders — Specification for the design and construction of refillable transportable seamless aluminium and aluminium alloy gas cylinders of capacity from 0,5 litre up to 150 litres*

EN 13322-1, *Transportable gas cylinders — Refillable welded steel gas cylinders — Design and construction — Part 1: Carbon steel*

EN ISO 10297, *Transportable gas cylinders — Cylinder valves — Specification and type testing (ISO 10297:2006)*

prEN ISO 11117, *Gas cylinders — Valve protection caps and valve guards — Design, construction and tests (ISO/DIS 11117:2006)*

EN ISO 13769, *Gas cylinders — Stamp marking (ISO 13769:2002)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

acetylene cylinder

cylinder containing a porous material with or without solvent for the storage of acetylene

NOTE For solvent free acetylene cylinders see Clause 6.

3.2

tare weight

see EN ISO 13769 and 4.5

3.2.1

for acetylene cylinders with solvent the tare weight is expressed by indicating two weights (in kilograms) TARE A and TARE S.

TARE A is the sum of the empty weight of the cylinder shell, the weight of the porous material, the specified weight of solvent content, the weight of the valve and the weight of all other parts which are permanently attached (e.g. by clamping or nut bolt fixing) to the cylinder when it is going to be filled,

TARE S is TARE A plus the weight of acetylene required to saturate the solvent at atmospheric pressure at 15 °C

3.2.2

for solvent free acetylene cylinders the tare weight is expressed by indicating TARE F, where TARE F is TARE A minus the weight of solvent

3.3**total weight**

for cylinders with solvent, total weight is TARE A plus the weight of the maximum acetylene content,

for solvent free cylinders, total weight is TARE F plus the weight of maximum acetylene content

3.4**water capacity**

capacity of the empty shell (excluding porous material) when filled with water

3.5**maximum acetylene content**

specified maximum weight of acetylene in the cylinder (in kilograms).

When a solvent is used it includes the weight of saturation gas

3.6**porous material**

single or multi-component material introduced or formed in the cylinder in order to fill it and which due to its porosity allows the absorption of the solvent/acetylene gas solution

NOTE The porous material may be either;

a) monolithic, consisting of a solid product obtained by reacting materials or by materials connected together with a binder,

or

b) non-monolithic, consisting of granular, fibrous or similar materials without addition of a binder.

3.7**porosity**

ratio, expressed as a percentage, of the volume of solvent which can be filled into the cylinder, complete with porous material, to the water capacity of the cylinder shell without porous material (see Annex B)

3.8**solvent**

liquid which is absorbed by the porous material and is capable of dissolving and releasing the acetylene

3.9**acetylene solvent ratio**

ratio of the maximum acetylene content to the specified weight of solvent content

3.10

working pressure

maximum settled pressure in bar (gauge) at a uniform temperature of 15 °C in a cylinder containing the maximum acetylene content and the specified weight of solvent content

3.11

manufacturer

company which fills the cylinder shell with porous material and which generally prepares it for charging with acetylene

4 Basic requirements

4.1 Cylinder shell

4.1.1 The acetylene cylinder shell shall conform to the requirements of the appropriate European Standard for design and construction of the cylinders, e.g.:

- a) for seamless steel, EN 1964-1;
- b) for seamless aluminium alloy, EN 1975;
- c) for welded steel, EN 13322-1.

NOTE 1 Other standards for the design and construction of cylinders are in preparation and appropriate standards should be conformed to when published.

NOTE 2 This requirement does not exclude continued use and replacing of porous materials of cylinder shells conforming to national requirements.

4.1.2 The minimum test pressure for the cylinder shell shall be 60 bar (gauge).

4.2 Porous material

4.2.1 The porous material in the cylinder shall be of such quality that it enables the completed cylinder to pass the safety tests included in Annex A. For safety reasons the porous material shall be able to prevent or inhibit a dangerous decomposition of the acetylene.

4.2.2 There shall be no hazardous reaction between the shell, the porous material, the acetylene, the solvent and any parts in contact with them, at any time.

4.2.3 To ensure the quality of the porous material and the solvent, production/batch test procedures for the preparation of the porous material shall be established by the manufacturer in accordance with Annex D.

4.2.4 Where joggle welds are used for the cylinder shell it shall be verified that no voids are left in the joggle region and that there is no movement between the porous material and the cylinder wall in the region of the joggle, which could lead to damage of the porous material (for joggle welds, see EN 13322-1).

4.3 Solvent

The specified weight of solvent content shall be such that the cylinder can meet the requirements of the tests included in Annex A.

4.4 Settled pressure

When the cylinder has been charged to the maximum acetylene content and the pressure has reached equilibrium at a uniform temperature of 15 °C, the pressure in the cylinder shall not exceed the working pressure for the type of cylinder (calculated in accordance with Annex C).

4.5 Cylinder identification

The identification shall conform to the requirements of EN ISO 13769.

NOTE EN 1089-1:1996, has been revised as EN ISO 13769, is in conflict with the actual transport regulations. For safety reasons it is recommended to calculate the tare weight under consideration of the following points:

- a) rounding down to three significant figures but at least one digit after the decimal point;
- b) including any kind of coating (e.g. painting).

4.6 Accessories

Valves for use with acetylene cylinders shall conform to the requirements of EN ISO 10297. Valve guards and caps for use with acetylene cylinders shall conform to the requirements of prEN ISO 11117.

NOTE Other accessories should conform to the requirements of appropriate European Standards, when available.

5 Approval procedures

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5.1 General

Representative cylinders, selected according to 5.3 by or on behalf of the approving organisation shall withstand successfully the type tests as required in 5.4 prior to type approval being granted to the request made by the manufacturer of the porous material (see 5.2).

5.2 Requests for approval

5.2.1 A request for the approval of acetylene cylinders may cover a range of different volumes provided that:

- a) the construction is similar (either seamless cylinders or cylinders with circumferential joggle welds or cylinders with butt welds only);
- b) the nominal outside diameter of the cylinder falls within the range of either:
 - 1) up to and inclusive of 270 mm or
 - 2) greater than 270 mm;
- c) the acetylene solvent ratios are the same;
- d) the maximum acetylene content per litre water capacity is the same;
- e) the cylinders contain the same porous material from the same factory and, the same solvent;
- f) the cylinder shells are made from the same type of material (steel or aluminium etc.).

5.2.2 Each request for approval shall include the following information:

a) a schedule of the different types of acetylene cylinder (as defined in **5.3.2**) which form the subject of the request for approval and which includes, for each size of cylinder, the following information:

- 1) nominal water capacity in litres;
- 2) solvent to be used;
- 3) specified weight of solvent content in kg;
- 4) maximum weight of acetylene content in kg;
- 5) test pressure of the cylinder in bar (gauge);
- 6) the working pressure at 15 °C;
- 7) name of manufacturer or place of production of porous material;
- 8) identification of porous material (trade name) to be stamped;
- 9) rejection criteria (e.g. maximum top clearance between porous material and shell);

b) a description of the porous material as it exists in the cylinder, which gives sufficient information concerning production process and quality control procedure to verify conformance to Annex D;

c) a report on the porosity determinations carried out by or on behalf of the manufacturer on the test cylinders provided, according to the method given in Annex B, and a statement of the maximum and minimum limits of porosity within which the porous material will be manufactured.

5.2.3 The request for approval shall be accompanied by a declaration from the manufacturer stating that in the event of approval, the production of the porous material will be in accordance with the information given in the request for approval in **5.2.2**.

5.3 Submission of cylinders for type tests

5.3.1 The manufacturer shall submit the required number of representative cylinders including spares for type test. These cylinders shall be complete with all fittings and porous material, but without solvent or acetylene unless otherwise specified by the approving organisation.

The process of filling of the porous material shall be audited by or on behalf of the approving organisation.

5.3.2 Cylinders to be tested shall be selected so that:

- a) for cylinders with a nominal water capacity greater than 60 l and up to 150 l, tests shall be on a cylinder of capacity considered to be representative of the size under consideration;
- b) for cylinders with a nominal water capacity up to and including 60 l, tests shall be on the smallest and the largest cylinders of every range proposed by the manufacturer;
- c) for cylinders with a nominal water capacity below 20 l, no test is required on cylinders having an acetylene content of not more than 90 % of the equivalent proportional content used in approved cylinders of 20 l or greater water capacity. However in such a case the maximum acetylene content shall not exceed 0,180 kg/l. For cylinders having a higher acetylene content, tests shall be carried out on cylinders of a nominal water capacity representative of the size under consideration.

5.4 Cylinder type tests

5.4.1 General

Cylinders with porous material shall successfully withstand the type test specified in Annex A.

5.4.2 Prototype approval tests

For a single size of cylinder as defined in **5.3.2**:

- a) three cylinders shall be subjected to the elevated temperature test (see **A.1**);
- b) three cylinders shall be subjected to the backfire test (see **A.2**). In case of test failures, as defined in **A.2.2.5** and **A.2.2.6**, the test(s) shall be repeated.

For a range of cylinder sizes as defined in **5.3.2**:

- c) three cylinders of the largest size shall be subjected to the elevated temperature test (see **A.1**);
- d) three cylinders of the smallest and largest size shall be subjected to the backfire test (see **A.2**). In case of test failures, as defined in **A.2.2.5** and **A.2.2.6**, the test(s) shall be repeated.

5.4.3 Extended approval tests

For cylinders containing the same porous material and solvent for which prototype approval (see **5.4.2**) has been given, a reduced test program may be performed.

- a) For cylinders of the same size or range of sizes but of different construction and/or made from different type of material, but otherwise conforming to **5.2.1**:

The elevated temperature test (see **A.1**) need not be carried out.

Three cylinders of the smallest and the largest size shall be subjected to the drop treatment as specified in **A.2.1**. They shall then be sectioned longitudinally and inspected for damage to the porous material (e.g. excessive clearance, cracks, disintegration). If the porous material is undamaged no further tests according to **A.1** and **A.2** are required. If the porous material is damaged a complete backfire test (see **A.2**) on a further three cylinders shall be carried out.

NOTE Welded cylinders previously approved with joggle welds need no extended approval test for other type of welds.

- b) For cylinders outside the approved sizes (or ranges of sizes):

Three cylinders shall be subjected to the elevated temperature test (see **A.1**) in case the new size (or range of sizes) is larger than previously approved, otherwise the elevated temperature test need not be carried out.

Three cylinders of each size shall be subjected to the backfire test (see **A.2**). In case of test failures, as defined in **A.2.2.5** and **A.2.2.6**, the test(s) shall be repeated.