SLOVENSKI STANDARD
SIST EN 12863:2002

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Premiļne plinske jeklenke - Periodiļni nadzor in vzdrģevanje jeklenk za raztopljeni acetilen

Transportable gas cylinders - Periodic inspection and maintenance of dissolved acetylene cylinders

Ortsbewegliche Gasflaschen - Wiederkehrende Prüfung und Instandhaltung von Gasflaschen für gelöstes Acetylen

Bouteilles a gaz transportables - Contrôle et entretien périodiques des bouteilles d'acétylene dissous

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Transportable gas cylinders - Periodic inspection and maintenance of dissolved acetylene cylinders

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Ortsbewegliche Gasflaschen - Wiederkehrende Prüfung und Instandhaltung von Gasflaschen für gelöstes Acetylen

This European Standard was approved by CEN on 6 March 2002.

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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 Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Management Centre: rue de Stassart, 36 B-1050 Brussels

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Contents

Foreword

This document EN 12863:2002 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of an identical text or by endorsement, at the latest by December 2002, and conflicting national standards shall be withdrawn at the latest by December 2002.

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.

In this standard the annexes A, B, D and E are informative. Annex C is normative.

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, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

Acetylene cylinders differ from all other cylinders transporting compressed or liquefied gases because they contain a porous mass and normally a solvent in which the acetylene stored is dissolved. However, for special applications there exist some acetylene cylinders containing a porous mass and no solvent. For the periodic inspection cycle, due regard should be given to the different types of construction of cylinders and porous masses. The remainder of this document should be read considering these differences.

The primary objective of the presence of the porous mass is to limit an acetylene decomposition, should it be initiated, and thus prevent a cylinder incident. If some porous mass is missing, or if a defect (e.g. a cavity, crack or void of significant size) exists as a result of breakdown or subsidence of the porous mass, then the decomposition could progress at a rate which can cause a violent failure of the cylinder.

1 Scope

This European Standard specifies seamless and welded steel or seamless aluminium alloy cylinders intended for the transport of acetylene in cylinders of water capacity up to 150 l and specifies the requirements for the periodic inspection and maintenance of acetylene cylinders, regardless of the method of manufacture of the shell.

This European Standard also applies to solvent free acetylene cylinders.

This European Standard also specifies a procedure to qualify existing gas cylinders for free movement between member states of the European Union (see annex A).

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places 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 (including amendments).

EN 1800:1998, *Transportable gas cylinders — Acetylene cylinders — Basic requirements and definitions.*

EN 1089-1, *Transportable gas cylinders — Gas cylinder identification (excluding LPG) — Part 1: Stampmarking.*

EN 1089-2, *Transportable gas cylinders — Gas cylinder identification (excluding LPG) — Part 2: Precautionary labels.*

EN 1089-3, *Transportable gas cylinders — Cylinder identification — Part 3: Colour coding system.*

EN ISO 13341, *Transportable gas cylinders — Fitting of valves to gas cylinders (ISO 13341:1997).*

3 Terms and definitions

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

3.1
cylinder shell
pressure vessel manufactured for storage and transport and suitable for containing a porous mass, a solvent, where relevant, and acetylene

3.2
complete cylinder
cylinder shell ready to be charged with acetylene gas, which is complete with porous mass, solvent where relevant, saturation gas, valve, and any valve protection permanently fixed to the cylinder shell

3.3
porous mass
single or multi-component substance introduced into, or formed in the cylinder shell, in order to fill it and due to its porosity allow the absorption of the solvent and acetylene gas. The porous mass can be of two types

a) a non-monolithic porous substance consisting of granular, fibrous or similar substances without the addition of any binding materials;

b) a monolithic porous substance consisting of materials having reacted to form a compact product or of materials connected together through a binding compound(s). This type of porous substance may be manufactured with a controlled clearance between the shell and the substance (see annex D)

3.4
porosity
ratio expressed in percentage of the volume of the solvent, which can be filled in the cylinder equipped with the porous mass, to the water capacity of this cylinder without porous mass (determined according to annex B of EN 1800:1998)

3.5
solvent
liquid which is absorbed by the porous mass and is capable of dissolving and releasing the acetylene gas

3.6
saturation gas
mass of acetylene dissolved in the solvent in the cylinder at atmospheric pressure and 15 °C

3.7
tare weight
for acetylene cylinders the tare weight is expressed by indicating weights corresponding to:

3.7.1
tare A
sum of the empty weight of the cylinder shell, the porous mass, the specified mass of solvent, the valve and the mass of all other parts which are permanently attached (e.g. by clamping or bolting) to the cylinder when it is going to be filled

3.7.2
tare S
TARE A plus the weight of acetylene required to saturate the solvent at atmospheric pressure and at a temperature of 15 °C

3.7.3
tare F
for solvent free acetylene cylinders the tare weight is expressed by indicating a TARE F, where TARE F of an acetylene cylinder is TARE A minus the weight of solvent

4 General

4.1 Requirements for inspection

The periodic inspection of acetylene cylinders shall be carried out only by competent and trained persons who shall ensure that the cylinders are fit for continued safe use.

NOTE A competent person is a person who has the necessary technical knowledge, experience and authority to assess and approve materials for use with gases and to define any special conditions of use that are necessary. Such a person will also normally be formally qualified in an appropriate technical discipline.

Due to the presence of a porous mass in the cylinder neither a pressure test (hydraulic or pneumatic) nor a visual inspection of the internal surface of the shell, is required by this standard.

Where cylinders are manufactured according to National Regulations and are intended to be qualified under the Transportable Pressure Equipment Directive (TPED) for free movement and use between member states of the European Union, additional requirements are specified in annex A.

4.2 Intervals between periodic inspections

A cylinder shall fall due for a periodic inspection on its first receipt by a filler after the expiry of the interval of 5 years in the case of non-monolithic massed cylinders, or 10 years in the case of monolithic massed cylinders.

NOTE These intervals conform to the current RID/ADR regulations.

However additional initial inspection requirements for newly massed cylinders are required as follows:

a) Non-monolithic mass

For all newly massed cylinders an initial inspection according to this standard shall be either before 2 years in service or before the first fill after the 2 years have elapsed.

b) Monolithic masses

For all newly massed cylinders an initial inspection according to this standard shall be either before 3 years in service or before the first fill after the 3 years have elapsed.

After the initial inspection according to either a) or b), the normal period as stated above shall apply.

Provided the cylinder has been subjected to normal conditions of use and has not been subjected to abusive or abnormal conditions rendering the cylinder unsafe, there is no general requirement for the user to return a gas cylinder before the content has been used, even though the test interval may have lapsed.

5 Preparation of gas cylinder

5.1 Removal of gas

Before proceeding with the inspection, cylinders shall be depressurised of gas. Cylinders shall be checked for pressure both before and after depressurisation. Depressurization shall be carried out in a safe manner having due regard to the characteristics of acetylene. Depressurisation shall be carried out over a period long enough to ensure a removal of all acetylene, except saturation gas (see clause 3.6). Precautions shall be taken because variations in temperature influence the quantity of acetylene in the form of saturation gas.

NOTE The absence of a positive pressure reading does not clearly indicate the absence of excess gas due to the possibility of a blocked valve (see annex B).

In case of any doubts regarding the efficiency of the depressurisation cycle, the cylinder shall be weighed.

A cylinder weighing greater than the tare weight (see 3.7) stamped on the cylinder is not always a clear indication of the presence of excess gas. Consideration should be given to the possibility of contamination, such as an excess of solvent or the ingress of water.

A cylinder weighing less than or equal to the stamped tare weight is not always a clear indication of the absence of gas under pressure. Consideration should be given to factors such as a possible solvent shortage or external corrosion causing a loss of shell weight.

5.2 Preparation for external visual inspection

Each cylinder shall be cleaned and have all loose coatings, corrosion products, tar, oil or other foreign matter removed from its external surface by a suitable method, e. g. by brushing, shot blasting (under closely controlled conditions to ensure that there is no leakage of acetylene into the brushing or shot blasting cabinet) water jet abrasive cleaning, chemical cleaning or other methods. Care shall be taken at all times to avoid damaging the cylinder and pressure relief devices where fitted.

NOTE The external visual inspection, in accordance with 6.1, can be carried out at this stage

5.3 Valve removal

Before removing the valve from an acetylene cylinder it shall be determined that the cylinder has been completely depressurised as described in 5.1. If there is any reason to believe that a valve is blocked (e.g. the lack of an audible release of gas when opening the valve) and that the cylinder may still contain residual gas under pressure, checks shall be made e.g. by introducing an inert gas at a pressure lower than 5 bar and observing its discharge.

If it is found that the valve is obstructed, then a suitable method shall be employed to remove the gas or the valve, taking into consideration the design of the valve and ensuring that all necessary precautions are taken having due regard to the hazards that can result from an uncontrolled operation (see annex B). Devalving shall take place in the open or in a ventilated area. The temperature of the cylinder when removing the valve should be close to the ambient temperature within the inspection area, so as to avoid either excess venting of residual gas or ingress of air.

NOTE The cylinders should not be left open or without valves longer than necessary for the inspection.

5.4 Removal of neck/core hole filters

Acetylene cylinders usually contain neck filters/core hole packing, consisting of filter (or metallic gauze) and felts. Neck filters and packing materials, placed between the top of the porous mass and the base of the valve stem, shall be removed, as appropriate, to enable an inspection of the porous mass in accordance with the inspection requirements of the porous mass manufacturer or the inspection body.

Some porous mass manufacturers equip monolithic mass acetylene cylinders with a wooden plug, which forms an integral part of the porous mass. This plug, which is situated below the neck filter (or metallic gauze), shall be left intact and not removed for the purpose of the visual examination, provided that the wooden plug is in the right position, permitting the measurement of the gap in accordance with the manufacturer's instructions. If on a previous inspection the wooden plug has been tampered with or removed by mistake or is not in the right position this plug shall be replaced with a new one in line with the porous mass manufacturer's approval/specification.

Special care shall always be taken when removing filters or packing material in view of the possibility of some restrictions at the neck with residual pressure underneath, which, if suddenly released, can blow the filter out with some of the porous substance and can cause injury.

NOTE The presence of fine carbon powder or other contaminants on the filters or packing material is indicative of a flashback having occurred.

6 Inspection and maintenance

6.1 Inspection procedure

The external surface of each cylinder shall be inspected for:

a) dents, cuts, gouges, bulges, cracks, laminations (as defined in Table C.1) or excessive base wear;

b) heat damage, torch or electric arc burns (as defined in Table C.1);

c) corrosion (as defined in Table C.2);

d) other defects such as illegible or unauthorised stamp markings, unauthorised additions or modifications (see Table C.1);

e) integrity of all permanent attachments.

Damaged valve guards, threaded neck rings and foot rings may be repaired or replaced as appropriate. No welding or any heat shall be directly applied to the pressure containing part of the cylinder. If welding is

performed on a non-pressure-containing part of the cylinder, due care shall be taken with regard to the presence of acetylene and solvent.

For rejection criteria, see annex C. Cylinders no longer suitable for future service shall be rendered unserviceable (as defined in clause 10).

6.2 Examination of the porous mass

6.2.1 General

Following 5.4, the porous mass shall be examined for the presence of visible contamination or other defects which could affect the suppression of an acetylene decomposition. The examination shall be performed, where necessary, by the appropriate use of special spark-resistant tools such as metal wire probes, rods, feeler or clearance gauges (see annex D) to check the firmness and the presence of voids or other defects in the mass. 6.2.2 to 6.2.4 give the rejection criteria. Care shall be taken to ensure that the porous mass is not damaged by the inspection tools.

6.2.2 Contamination

The porous mass shall be checked visually for contamination such as the presence of significant fine carbon powder and water, or oil deposits or if there has been a discolouration of the porous mass. Depending on the level of such contamination, the competent person shall decide if the porous mass is to be rejected.

6.2.3 Monolithic masses – Cracking, crumbling or cavitation

The visual inspection shall verify that the porous mass shows no signs of cracking or crumbling. Cylinders with masses that show cracking or crumbling shall be rejected. If the cylinder is equipped with a wooden plug (see 5.4) it shall be checked by applying a gentle load that the plug is firmly fixed in its position and there is no lateral movement.

The maximum gap between the top of the cylinders and the monolithic porous mass shall not exceed that in the type approval, if specified, for that cylinder. Those gaps up to the maximum used in the type approval tests shall apply. If at a later stage, cylinders with other gap sizes pass the requirements of the flashback test as in EN 1800, and are approved, then these gap sizes may also apply.

If such data is unavailable, the gap shall not exceed 5 mm. Additionally, the porous mass shall be checked to ensure that there is no significant lateral movement. Cylinders with masses that show cavitation or lateral movement shall be rejected.

6.2.4 Non-monolithic masses – Compaction

Non-monolithic porous masses which have been subjected to compaction, or exhibit a loss of compaction shall be rejected, or repaired in accordance with 6.6.

6.3 Pressure relief devices including fusible plugs

Where fusible plugs or other pressure relief devices are used they shall be examined for damage. Where damage is found the device shall be replaced and checked for gas tightness. If it is decided to replace relief devices with solid plugs, this shall be performed in accordance with a written procedure, approved by the inspection body.