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Nadomešča:
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Oprema in pribor za utekočinjeni naftni plin (UNP) - Periodični pregledi premičnih, ponovno polnljivih jeklenk za UNP (vključno z dopolnilom A1)

LPG equipment and accessories - Periodic inspection of transportable refillable LPG cylinders

Flüssiggas-Geräte und Ausrüstungsteile - Wiederkehrende Prüfung von ortsbeweglichen, wiederbefüllbaren Flaschen für Flüssiggas (LPG)

Equipement et accessoires GPL - Contrôle périodique des bouteilles de GPL transportables et réutilisables

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ICS:

23.020.30	Tlačne posode, plinske jeklenke	Pressure vessels, gas cylinders
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EUROPEAN STANDARD

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LPG equipment and accessories - Periodic inspection of transportable refillable LPG cylinders

Équipement et accessoires GPL - Contrôle périodique des bouteilles de GPL transportables et réutilisables

Flüssiggas-Geräte und Ausrüstungsteile - Wiederkehrende Prüfung von ortsbeweglichen, wiederbefüllbaren Flaschen für Flüssiggas (LPG)

This European Standard was approved by CEN on 6 January 2008 and includes Amendment 1 approved by CEN on 30 January 2012.

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 CEN-CENELEC Management Centre or to any CEN member.

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EN 1440:2008+A1:2012 (E)**Foreword**

This document (EN 1440:2008+A1:2012) has been prepared by Technical Committee CEN/TC 286 "Liquefied petroleum gas equipment and accessories", the secretariat of which is held by NSAI.

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of an identical text or by endorsement, at the latest by September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This European Standard has been submitted for reference into the RID (Regulations concerning the International Carriage of Dangerous Goods by Rail) and/or in the technical annexes of the ADR (European Agreement concerning the international carriage of Dangerous goods by Road). ~~A1~~ deleted text ~~A1~~

The main changes between this version of the ~~A1~~ Standard ~~A1~~ and the 2005 version is that this version combines EN 1440:2005, EN 14767:2005, EN 14795:2005 and EN 14914:2005 into a single ~~A1~~ European Standard ~~A1~~.

This document includes Amendment 1, approved by CEN on 2012-01-30.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ~~A1~~ ~~A1~~.

This European Standard supersedes ~~A1~~ EN 1440:2008 ~~A1~~, EN 14767:2005, EN 14795:2005 and EN 14914:2005.

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~~A1~~ The changes in this amendment (EN 1440:2008/PrA1:2011) include:

- inclusion of the new RID/ADR requirement relative to the 15 year interval between periodic inspections introduced in ADR 2011;
- revision of procedures of periodic inspection in order to meet all RID/ADR requirements;
- transfer of the requirements for the testing of cylinders with a water capacity less than 6,5 l from the body of the text to new Annex J. ~~A1~~

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, 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, Turkey and United Kingdom.

Introduction

The primary objective of the periodic inspection of transportable refillable liquefied petroleum gas (LPG) cylinders is that, at the completion of the tests, the cylinders can be re-introduced into service for a further period of time.

The very large populations of traditional steel LPG cylinders in use have led to the development of alternative methods of inspection.

This European Standard has ^{A1} *deleted text* _{A1} been prepared to reflect the current state of the art for period inspecting of LPG cylinders, and is based on the operating experience of many hundreds of millions of cylinder years of service.

This European Standard calls for the use of substances and procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

It has been assumed in the drafting of this European Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

Where judgements are called for, it has been assumed that they are made by competent persons who have been trained specifically for the tasks.

This ^{A1} European Standard _{A1} is a combination of EN 1440:2005, with EN 14767:2005, EN 14795:2005 and EN 14914:2005.

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EN 1440:2008+A1:2012 (E)**1 Scope**

This European Standard specifies procedures for periodic inspection and testing, for transportable refillable LPG cylinders with a water capacity from 0,5 l up to and including 150 l.

This ^{A1} European Standard ^{A1} is applicable to the following:

- welded and brazed steel LPG cylinders with a specified minimum wall thickness (see EN 1442 and EN 12807 or the equivalent standard);
- welded steel LPG cylinders ^{A1} manufactured to an alternative design and construction ^{A1} (see EN 14140:2003+A1 or the equivalent standard);

^{A1} NOTE This European Standard also applies to protected cylinders, see 5.3 and Annex G. ^{A1}

- welded aluminium LPG cylinders (see EN 13110 or the equivalent standard);
- composite LPG cylinders (see EN 14427 or the equivalent standard).

This ^{A1} European Standard ^{A1} is intended to be applied to cylinders complying with RID/ADR (including pi marked cylinders) and also to existing non RID/ADR cylinder populations.

This ^{A1} European Standard ^{A1} does not apply to cylinders permanently installed in vehicles.

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2 Normative references

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

EN 837-1, *Pressure gauges — Part 1: Bourdon tube pressure gauges — Dimensions, metrology, requirements and testing*

EN 837-3, *Pressure gauges — Part 3: Diaphragm and capsule pressure gauges — Dimensions, metrology, requirements and testing*

^{A1} EN 1439:2008 ^{A1}, *LPG equipment and accessories — Transportable refillable welded and brazed steel Liquefied Petroleum Gas (LPG) cylinders — Procedure for checking before, during and after filling*

EN 1442, *LPG equipment and accessories — Transportable refillable welded steel cylinders for LPG — Design and construction*

EN 10028-7, *Flat products made of steels for pressure purposes — Part 7: Stainless steels*

EN 12816, *Transportable refillable steel and aluminium LPG cylinders — Disposal*

^{A1} *deleted text* ^{A1}

^{A1} EN 13322-1, *Transportable gas cylinders — Refillable welded steel gas cylinders — Design and construction — Part 1: Carbon steel* ^{A1}

EN 14140:2003+A1:2006, *LPG equipment and accessories — Transportable refillable welded steel cylinders for LPG — Alternative design and construction*

EN 14427:2004, *Transportable refillable fully wrapped composite cylinders for Liquefied Petroleum Gases (LPG) — Design and Construction*

EN 14894, *LPG equipment and accessories — Cylinder and drum marking*

EN 14912, *LPG equipment and accessories — Inspection and maintenance of LPG cylinder valves at time of periodic inspection of cylinders*

EN ISO 4624, *Paints and varnishes — Pull-off test for adhesion (ISO 4624)*

EN ISO 4628-3, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 3: Assessment of degree of rusting (ISO 4628-3)*

EN ISO 14245, *Gas cylinders — Specifications and testing of LPG cylinder valves — Self-closing (ISO 14245)*

EN ISO 15995, *Gas cylinders — Specifications and testing of LPG cylinder valves — Manually operated (ISO 15995)*

ISO 9162, *Petroleum products — Fuels (class F) — Liquefied petroleum gases — Specifications*

3 Terms and definitions

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

3.1

inspection body

independent inspection and testing body approved by the competent authority

3.2

competent person

person which by combination of appropriate qualification, training, experience, and resources, is able to make objective judgments on the subject

3.3

periodic inspection

activities carried out at defined intervals, such as examining, measuring, testing or gauging the characteristics of a pressure vessel and comparing these with specified requirements

3.4

production batch

group of cylinders made consecutively during the same year, by the same manufacturer using the same manufacturing techniques to the same design, nominal size and material specifications on the same production machinery and subject to the same heat treatment conditions

NOTE In this context, "consecutively," need not imply continuous production.

3.5

protected cylinder

cylinder fully covered with a protection against impact and external corrosion so that the cylinder wall cannot be seen

3.6

casing

permanently attached sleeve covering part of, or the whole of the pressure containing envelope of a composite cylinder, usually incorporating a foot ring and a shroud

NOTE Permanently attached means that casing cannot be removed during service without destruction, or by using special tools.

EN 1440:2008+A1:2012 (E)**3.7****A1 liquefied petroleum gas****LPG**

low pressure gas composed of one or more light hydrocarbons which are assigned to UN 1011, UN 1075, UN 1965, UN 1969 or UN 1978 only and which consists mainly of propane, propene, butane, butane isomers, butene with traces of other hydrocarbon gases A1

3.8**tare mass**

sum of the mass of the empty cylinder, the mass of the valve including a dip tube where fitted, and the mass of all other parts that are permanently attached to the cylinder when it is being filled, e.g. fixed valve guard

A1 3.9**competent authority**

authority designated as such in each country in accordance with national regulation A1

4 Written scheme of inspection

The interval between periodic inspections shall be dependent on the content of a written scheme.

NOTE A written scheme, describes work procedures, criteria, responsibilities and other minimum requirements.

The A1 maximum A1 interval between periodic inspections for welded steel, brazed steel and welded aluminium LPG cylinders shall be 10 years.

A1 However for welded and brazed steel LPG cylinders manufactured before the date 2015-01-01, this maximum interval can be extended to 15 years, provided the conditions of Annex E are fully met and approval from the relevant competent authority(ies) has been given.

The interval between periodic inspections of RID/ADR welded steel LPG cylinders can be extended to 15 years provided the requirements of Annex I are fulfilled and approval from the relevant competent authority has been given. A1

For protected cylinders the interval is determined in accordance with G.4.1.

For composite cylinders, the determination of the interval between periodic inspections shall depend on the content of a written scheme that shall be approved by a competent authority.

Annex F gives guidance on conditions to obtain approval for 10-year interval. A1 *deleted text* A1

5 Procedures for periodic inspection**5.1 General**

A1 Periodic inspections/tests shall be carried out by a competent person under the control of an inspection body based on a written scheme and in accordance with the procedures specified in Table 1.

For composite cylinders the written scheme shall be approved by the competent authority.

NOTE 1 A written scheme describes work procedures, criteria, responsibilities and other minimum requirements.

Cylinders rejected shall be segregated and be either reconditioned, re-tested or rendered unserviceable.

The decision to render a cylinder unserviceable can be taken at any stage during the periodic inspection procedure. With agreement by the owner, a cylinder shall be rendered unserviceable in accordance with EN 12816 so that it cannot be re-issued into service as a pressure vessel.

NOTE 2 In some countries, render unserviceable, means scrapping.

NOTE 3 With the agreement of the competent authority, the proof pressure test of cylinders can be replaced by an equivalent method based on acoustic emission testing, ultrasonic examination or a combination of acoustic emission testing and ultrasonic examination. EN ISO 16148 may be used as a guide for acoustic emission testing procedures.

NOTE 4 Tests can be performed in any order as determined by the written scheme.


Table 1 – Procedures for periodic inspection

Cylinder types	Maximum periodic inspection interval	Procedures
Brazed steel cylinders	10 years	— External visual inspection as described in 6.1.2.1, 6.1.3 and Annex A
Welded steel cylinders in conformity with EN 1442, EN 13322-1 or Council Directive 84/527/EEC Annex I parts 1 to 3	10 years; or 15 years under the conditions of Annex I	— Proof pressure test (hydraulic proof pressure test or, with the agreement of the competent authority, a pneumatic proof test and leak test) as described in 5.2 and 6.2 — Internal condition check as described in 6.3.1 and Annex A — Inspection of threads as described in 5.2 and 6.4
Welded and brazed steel cylinders – manufactured before 1 st January 2015	10 years; or 15 years under the conditions of Annex E	— Inspection of valves as described in 6.5
Welded steel cylinders in conformity with EN 14140 or equivalent standard	10 years	— External visual inspection as described in 6.1.2.1, 6.1.3 and Annex B — Proof pressure test (hydraulic proof pressure test or, with the agreement of the competent authority, a pneumatic proof test and leak test) as described in 5.2 and 6.2
Welded steel cylinders in conformity with EN 14140 or equivalent standard – manufactured before 1st January 2015	10 years; or 15 years with the agreement of the competent authority and under the conditions of Annex E	— Internal condition check as described in 6.3.1 and Annex B — Inspection of threads as described in 5.2 and 6.4 — Inspection of valves as described in 6.5

Table 1 (continued)

Welded aluminium cylinders	10 years	<ul style="list-style-type: none"> — External visual inspection as described in 6.1.2.1, 6.1.3 and Annex C — Proof pressure tests (hydraulic proof pressure test or, with the agreement of the competent authority, a pneumatic proof test and leak test) as described in 5.2 and 6.2 — Internal condition check as described in 6.3.2 — Inspection of threads as described in 5.2 and 6.4 — Inspection of valves as described in 6.5
Composite cylinders	<p>As determined by the competent authority.</p> <p>Guidance for 10 year periodic inspection interval described in Annex F</p>	<ul style="list-style-type: none"> — External visual inspection as described in 6.1.2.2, 6.1.3 and Annex D — Proof pressure test (hydraulic proof pressure test or, with the agreement of the competent authority, a pneumatic proof test and leak test) as described in 5.2 and 6.2 — Internal condition check as described in 6.3.2 — Inspection of threads as described in 5.2 and 6.4 — Inspection of valves as described in 6.5
Protected cylinders	<p>As determined by the competent authority.</p> <p>Annex G provides guidance for a inspection scheme with an interval of maximum 3 years after putting in service and thereafter every “n” years dependent from the results of the first periodic inspection</p>	<p>As specified in Annex G</p>
Cylinders with a water capacity of less than 6.5 litres	10 years	As for welded steel cylinders in conformity with EN 1442 (see above), or, with the agreement of the competent authority, as specified in Annex J
Non ADR/RID welded and brazed steel cylinders	<p>As determined by the competent authority.</p> <p>15 years under the conditions of Annex E</p>	As specified in Annex H

5.2 Protected cylinders

An alternative procedure for periodic inspection of protected cylinders is described in Annex G. 

 *deleted text* 

6 Inspections and tests

6.1 External visual inspection

6.1.1 Preparation for external visual inspection

- a) If required, the cylinder shall be cleaned and have all loose coatings or labels, corrosion products, tar, oil or other foreign matter removed from its external surface.
- b) Care shall be taken to avoid damaging the cylinder.
- c) When cylinders are treated by a process that might remove cylinder material, the inspection body shall decide whether a thickness test is required, e.g. ultrasonic thickness check.

NOTE Cleaning methods can be wire brushing, shot blasting (in accordance with EN ISO 8504 all parts and EN ISO 8501-1), water jet cleaning, chemical cleaning or other suitable methods.

6.1.2 Inspection procedure

6.1.2.1 Welded steel, brazed steel and welded aluminium LPG cylinders, shall be inspected for:

- a) dents, cuts, gouges, bulges, cracks, laminations or punctures, applying the criteria for rejection in Annex A, Annex B and Annex C as appropriate;
- b) corrosion, giving special attention to areas where water can be trapped, at the base of the cylinder, the junction between the cylindrical shell and the foot-ring, the cylindrical shell and the valve guard or shroud, and in particular hidden corrosion (e.g. data plate) applying the criteria for rejection given in Annex A, Annex B and Annex C as appropriate;
- c) other defects (e.g. depressed bung or fire damage) applying the criteria for rejection given in Annex A, Annex B and Annex C as appropriate;
- d) integrity of all permanent attachments;
- e) integrity of all mandatory permanent markings.

6.1.2.2 Composite cylinders shall be inspected for:

- a) cuts, gouges, bulges, cracks or de-laminations, applying the criteria for acceptance/rejection in Annex D;
- b) other defects e.g. depressed bung or fire damage applying to the criteria for acceptance/rejection in Annex D;
- c) integrity of all permanent attachments;
- d) integrity of the mandatory permanent marking.