



# SLOVENSKI STANDARD

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Nadomešča:

SIST EN 1440:2008+A1:2012

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**Oprema in pribor za utekočinjeni naftni plin (UNP) - Premične, ponovno polnljive, varjene in trdo spajkane jeklenke za UNP - Periodična kontrola**

LPG equipment and accessories - Transportable refillable traditional welded and brazed steel Liquefied Petroleum Gas (LPG) cylinders - Periodic inspection

Flüssiggas-Geräte und Ausrüstungsteile - Ortsbewegliche, wiederbefüllbare, geschweißte und hartgelötete Flaschen aus Stahl für Flüssiggas (LPG) - Wiederkehrende Inspektion

Equipements pour GPL et leurs accessoires - Bouteilles de gaz de pétrole liquéfiés (GPL) en acier soudé et brasé transportables et rechargeables - Contrôle périodique

**Ta slovenski standard je istoveten z: EN 1440:2016**

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**ICS:**

23.020.35 Plinske jeklenke Gas cylinders

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EUROPEAN STANDARD

EN 1440

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ICS 23.020.30

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## LPG equipment and accessories - Transportable refillable traditional welded and brazed steel Liquefied Petroleum Gas (LPG) cylinders - Periodic inspection

Equipements pour GPL et leurs accessoires - Bouteilles de gaz de pétrole liquéfié (GPL) en acier soudé et brasé transportables et rechargeables - Contrôle périodique

Flüssiggas-Geräte und Ausrüstungsteile - Ortsbewegliche, wiederbefüllbare, herkömmlich geschweißte und hartgelötete Flaschen aus Stahl für Flüssiggas (LPG) - Wiederkehrende Inspektion

This European Standard was approved by CEN on 13 December 2015.

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.

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 CEN-CENELEC Management Centre has the same status as the official versions.

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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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**EN 1440:2016 (E)****European foreword**

This document (EN 1440:2016) 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 August 2016, and conflicting national standards shall be withdrawn at the latest by August 2016.

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 document in conjunction with EN 16728:2016<sup>1</sup> supersedes EN 1440:2008+A1:2012.

This European Standard has been submitted for reference into the RID [1] and the technical annexes of the ADR [2].

NOTE These regulations take precedence over any clause of this standard. It is emphasized that RID/ADR are being revised regularly at intervals of two years which may lead to temporary non-compliances with the clauses of this standard.

This European Standard deals with the periodic inspection requirements for transportable refillable welded and brazed steel LPG cylinders. **(standards.iteh.ai)**

For all other cylinder designs, EN 16728:2016<sup>1</sup> applies.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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<sup>1</sup> To be published in 2016.

## Introduction

The primary objective of the periodic inspection of transportable refillable liquefied petroleum gas (LPG) cylinders is that, on 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 been prepared to reflect the current methodology for periodic inspection of LPG cylinders and is based on extensive operating experience.

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.

Protection of the environment is a key political issue in Europe and elsewhere, for CEN/TC 286 this is covered in CEN/TS 16765 [3], and this Technical Specification should be read in conjunction with this standard.

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

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

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**EN 1440:2016 (E)****1 Scope**

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

This European Standard is applicable to welded and brazed steel LPG cylinders with a specified minimum wall thickness designed according to EN 1442, EN 12807, EN 13322-1, or equivalent standard (e.g. national codes).

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

NOTE The requirements of RID/ADR take precedence over those of this standard in the case of cylinders complying with that regulation, including pi marked cylinders.

This European Standard does not apply to cylinders permanently installed in vehicles.

**2 Normative references**

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

EN 837-1:1996, *Pressure gauges - Part 1: Bourdon tube pressure gauges - Dimensions, metrology, requirements and testing*

EN 837-3:1996, *Pressure gauges - Part 3: Diaphragm and capsule pressure gauges - Dimensions, metrology, requirements and testing*

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

EN 12807, *LPG equipment and accessories - Transportable refillable brazed steel cylinders for liquefied petroleum gas (LPG) - Design and construction*

EN 12816, *LPG equipment and accessories - Transportable refillable LPG cylinders - Disposal*

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

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 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)*



### 3 Terms and definitions

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

#### 3.1

##### **competent authority**

authority or authorities or any other body or bodies designated as such in each State and in each specific case in accordance with domestic law

#### 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

##### **inspection body**

independent inspection and testing body approved by the competent authority

#### 3.4

##### **Liquefied Petroleum Gas**

##### **LPG**

low pressure liquefied 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

#### 3.5

##### **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

#### 3.6

##### **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

### 4 Requirements for periodic inspection

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

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

The maximum interval between periodic inspections for LPG cylinders shall be 10 years; however it can be extended to 15 years under the following conditions:

- for LPG cylinders manufactured before the date 2015-01-01, provided the conditions of Annex B are fully met and approval from the relevant competent authority(ies) has been given; and
- for RID/ADR welded steel LPG cylinders, provided the requirements of Annex D are fulfilled and approval from the competent authority has been given.

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

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NOTE 2 RID [1] and ADR [2] include detailed requirements on the qualification, obligations, accreditation and approval of these inspection bodies.

Cylinders rejected shall be segregated and shall 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 such that it cannot be re-issued into service as a pressure vessel.

NOTE 3 In some countries render unserviceable means scrapping.

NOTE 4 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 [4] can be used as a guide for acoustic emission testing procedures.

NOTE 5 Tests can be performed in any order as determined by the written scheme.

**Table 1 — Requirements for periodic inspection**

Cylinder types	Maximum periodic inspection interval	Tests
Brazed steel cylinders in conformance with EN 12807 or equivalent standard.	10 years	<ul style="list-style-type: none"> <li>— External visual inspection as described in 5.1. and Annex A;</li> <li>— Proof pressure test (hydraulic proof pressure test or, with the agreement of the competent authority, a pneumatic proof test followed by a leak test) as described in 5.2;</li> </ul>
Welded steel cylinders in conformance with EN 1442, EN 13322-1 or equivalent standard (e.g. national codes).	<ul style="list-style-type: none"> <li>— 10 years; or</li> <li>— 15 years under the conditions of Annex B (cylinders manufactured before 1st January 2015); or</li> <li>— 15 years under the conditions of Annex D.</li> </ul>	<ul style="list-style-type: none"> <li>— Internal condition check as described in 5.3 and Annex A;</li> <li>— Inspection of threads as described in 5.4;</li> <li>— Inspection of valves as described in 5.5.</li> </ul>
Welded steel cylinders with a water capacity of less than 6.5 l.	10 years	As for welded steel cylinders in conformance with EN 1442 (see above), or with the agreement of the competent authority, as specified in Annex E.
Non RID/ADR welded and brazed steel cylinders.	As determined by the competent authority.	As specified in Annex C.

## 5 Inspections and tests

### 5.1 General

Relevant cylinder data shall be identified before any inspections or tests are carried out.

Cylinders which cannot be safely emptied of gas shall be set aside for special handling.

Cylinders with inoperative or blocked valves shall be set aside for safe valve removal.

Before preparing for inspection, manufacturer's guidelines shall be taken into account to avoid any damage to the cylinders.

Any chemical solutions and/or cleaning methods used shall be selected to ensure that they do not adversely affect cylinder material.

### 5.2 External visual inspection

#### 5.2.1 Preparation for external visual inspection

- a) If necessary, 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 include wire brushing, shot blasting (in accordance with EN ISO 8504 [6] series and EN ISO 8501-1 [5]), water jet cleaning, chemical cleaning or other suitable methods, that do not adversely affect any part of the cylinders.

#### 5.2.2 Inspection procedure

LPG cylinders shall be inspected for:

- a) dents, cuts, gouges, bulges, cracks, laminations or punctures while applying the criteria for rejection in Annex A;
- b) corrosion, applying the criteria for rejection given in Annex A; while giving special attention to areas where water can be trapped

EXAMPLE at the base of the cylinder;

the junction between the cylindrical shell and the foot-ring;

the junction between the cylindrical shell and the valve guard or shroud; and

hidden corrosion (e.g. under handles).

- c) other defects (e.g. depressed bung or fire damage) while applying the criteria for rejection given in Annex A;
- d) integrity of all permanent attachments; and
- e) integrity of all mandatory permanent markings.