



SLOVENSKI STANDARD

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LPG equipment and accessories - Transportable refillable welded steel cylinders for Liquefied Petroleum Gas (LPG) - Alternative design and construction; periodic inspection

Flüssiggas- Geräte und Ausrüstungsteile - Ortsbewegliche, wiederbefüllbare, geschweißte Flaschen aus Stahl für Flüssiggas (LPG) - Alternative Gestaltung und Konstruktion; wiederkehrende Prüfung

Equipements pour gaz de pétrole liquéfié et leurs accessoires - Bouteilles en acier soudées, transportables et rechargeables pour gaz de pétrole liquéfiés (GPL) - Autres solutions en matière de conception et de fabrication; inspection périodique

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ICS 23.020.30

English Version

LPG equipment and accessories - Transportable refillable
welded steel cylinders for Liquefied Petroleum Gas (LPG) -
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wiederbefüllbare, geschweißte Flaschen aus Stahl für
Flüssiggas (LPG) - Alternative Gestaltung und
Konstruktion; wiederkehrende Prüfung

This European Standard was approved by CEN on 9 December 2005.

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.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This European Standard (EN 14914:2005) 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 June 2006, and conflicting national standards shall be withdrawn at the latest by June 2006.

This European Standard has been submitted for reference into the RID and/or 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 European Standard are normative only when the standards themselves are referred to in the RID and/or the technical annexes of the ADR.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Introduction

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

Experience and confidence have been gained over more than 40 years for stainless steel cylinders used for pressurized beverages and 5 years for LPG. The population of stainless steel cylinders used for pressurized beverages is over 25 million, and the population of LPG stainless steel cylinders is over 4 million. This experience of stainless steel cylinders has shown that there was no problem of ageing, and that the burst pressure remains within the specification.

Periodic inspection is normally carried out at a test station operated under the responsibility of a competent gas organization, or of a third party.

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.

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1 Scope

This European Standard specifies inspection intervals, procedures for periodic inspection and testing, for transportable refillable welded steel LPG cylinders of alternative design and construction of water capacity from 0,5 l up to and including 150 l (see EN 14140).

This European Standard does not apply to cylinders permanently installed in vehicles, or to plant and filling equipment.

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 837-1:1996, *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 10028-7, *Flat products made of steels for pressure purposes — Part 7: Stainless steels*

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

EN 13152, *Specification and testing of LPG cylinder valves — Self closing*

EN 13153, *Specification and testing of LPG cylinder valves — Manually operated*

EN 14140:2003, *Transportable refillable welded steel cylinders for Liquefied Petroleum Gas (LPG) — Alternative design and construction*

prEN 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 14913, *LPG equipment and accessories — Transportable refillable welded steel cylinders for Liquefied Petroleum Gas (LPG) LPG equipment and accessories — Alternative design and construction; procedure for checking before, during and after filling*

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

competent body

person or corporate body defined by the national authority, which by combination of appropriate qualification, training, experience, and resources, is able to make objective judgements on the subject

3.2

competent person

person who by a combination of training, experience and supervision is able to make objective judgements on the subject

3.3

periodic inspection

activities carried out at defined intervals, such as examining, measuring, testing or gauging the characteristics of a cylinder and comparing these with specified requirements as defined in EN 14140, and marking to attest conformity

3.4

LPG (liquefied petroleum gas)

mixture of predominantly butane or propane with traces of other hydrocarbon gases classified in accordance with UN number 1965, hydrocarbon gases mixture, liquefied, NOS or UN number 1075, petroleum gases, liquefied

NOTE in some countries, UN number 1011, 1978 may also be designated LPG.

3.5

tare weight

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 Written scheme of inspection

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

The interval between periodic inspections shall be 15 years provided the conditions of Annex A are fully met and with the approval of the competent authority. An interval of 10 years shall apply if any of the conditions specified in Annex A are not met.

The inspection procedures to be applied shall be selected from the alternatives given in Clause 5.

5 Procedures for periodic inspection

5.1 General

Procedures for periodic inspection shall consist of an external visual inspection as described in 5.2 and, additionally, at least one of the procedures described in 5.3.

Periodic inspections/tests shall be carried out under the responsibility of a body approved by a competent authority.

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

The decision to render a cylinder unserviceable may be taken at any stage during the periodic inspection procedure. With the agreement of 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 In some countries, render unserviceable means scrapping.

5.2 External visual inspection

5.2.1 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 competent body shall decide whether a thickness test is required e.g. ultrasonic thickness check.

NOTE Cleaning methods may be wire brushing, shot blasting (see EN ISO 8504 and EN ISO 8501-1), water jet cleaning, chemical cleaning or other suitable methods.

5.2.2 Inspection procedure

The entire surface of the cylinder shall be inspected for:

- a) dents, cuts, gouges, bulges, cracks, laminations or punctures, applying the criteria for rejection in Table 1 for carbon steel cylinders and Table 4 for stainless steel cylinders;
- 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 body and the valve guard or shroud, and in particular hidden corrosion (e.g. data plate) applying the criteria for rejection given in Table 2 for carbon steel cylinders and Table 5 for stainless steel cylinders;
- c) other defects (e.g. depressed bung or fire damage) applying the criteria for rejection given in Table 3 for carbon steel cylinders and Table 6 for stainless steel cylinders;
- d) the integrity of all permanent attachments;
- e) the integrity of all mandatory permanent markings.

5.2.3 Visible defects for carbon steel cylinders

Rejection criteria for cylinders are described in Table 1, Table 2 and Table 3. For some criteria defined in Table 1 and all criteria defined in Table 3, the rejection limit is given in these tables.

For rejection criteria described in Table 1 that have no rejection limit, and for rejection criteria described in Table 2, this limit shall be defined in accordance with the following method:

- for each defect, 4 cylinders with the same defect shall be tested. The size of this defect is recorded. If the defects of the cylinders are different sizes, the size of the smaller defect shall be recorded;
- two cylinders shall be submitted to the burst test as described in EN 14140 and two cylinders shall be submitted to the fatigue test as described in EN 14140;
- if the cylinders pass the tests, the defect is acceptable. The rejection limit can then be defined by the size of that defect;
- when all rejection criteria have been established for a design of cylinder as defined in EN 14140, Table 1 and Table 2 shall be completed by the owner/manufacture of the cylinder.

Table 1 — Physical defects in the cylinder wall

Defects	Description	Rejection limit
Bulge	Visible swelling of the cylinder	All
Dent	A depression in the cylinder that has neither penetrated nor removed metal, and its width at any point is greater than 2 % of the external cylinder diameter	See 5.2.3 ^a
Cut or gouge	A sharp impression where metal has been removed or redistributed	See 5.2.3
Intersecting cut or gouge	The point of intersection of two or more cuts or gouges	All
Dent containing cut or gouge	A depression in the cylinder within which there is a cut or gouge	When the size of the dent or cut or gouge exceeds the dimensions for rejection as an individual defect
Crack	A split or rift in the cylinder shell	All
Lamination	Layering of the material within the cylinder wall appearing as a discontinuity, crack, lap or bulge at the surface	All

^a Appearance (e.g. sharp dent) and location (e.g. on shoulder of the cylinder) also play a part in the evaluation of dent severity.

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Table 2 — Corrosion on the cylinder wall

Defects	Description	Rejection limit
Isolated corrosion pits	A pitting of metal occurring in isolated areas at a concentration not greater than 1 pit per 500 mm ² of surface area	See 5.2.3
Area corrosion	Reduction in wall thickness over an area not exceeding 20 % of the cylinder surface	See 5.2.3
General corrosion	A reduction in wall thickness over an area exceeding 20 % of the cylinder surface	See 5.2.3
Chain pitting or line or channel corrosion	A series of pits or corroded cavities of limited width along the length or around the cylinder circumference	See 5.2.3
Crevice corrosion	Crevice corrosion occurs in the area of the intersection of the foot ring or shroud with the cylinder	See 5.2.3

Table 3 — Other defects

Defects	Description	Rejection limit
Depressed bung	Damage to the bung which has altered the profile of the cylinder	All or a limited level of depression/alignment deviation as agreed with the competent body
Arc or torch burns	Burning of the cylinder base metal, a hardened heat affected zone, the addition of extraneous weld metal, or the removal of metal by scarfing or cratering	All
Fire damage ^a	Excessive general or localized heating of a cylinder usually indicated by: <ul style="list-style-type: none"> – charring or burning of paint; – fire damage of the metal; – distortion of the cylinder; – melting of metallic valve parts; – melting of any plastic components, e.g. date ring, plug or cap 	All
Damage of handle if fitted	Excessive deforming of the handle	If there is a risk of an injury e.g. finger cut
Damaged shroud	Loose or badly deformed shroud	All
Damaged foot-ring	Not firmly attached foot-ring	Unstable or unbalanced cylinder

^a If paint is only superficially charred, a cylinder may be accepted by a competent person.

5.2.4 Visible defects for stainless steel cylinders

Rejection criteria for defects on stainless steel cylinders are described in Table 4, Table 5 and Table 6.

These tables shall apply to cylinders manufactured from stainless steel in accordance with EN 10028-7.