

This document is a preview generated by EVS

LPG equipment and accessories - Transportable refillable LPG cylinders other than traditional welded and brazed steel cylinders - Periodic inspection

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 16728:2016+A2:2020 sisaldab Euroopa standardi EN 16728:2016+A2:2020 ingliskeelset teksti.	This Estonian standard EVS-EN 16728:2016+A2:2020 consists of the English text of the European standard EN 16728:2016+A2:2020.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 29.04.2020.	Date of Availability of the European standard is 29.04.2020.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 23.020.35

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

EUROPEAN STANDARD

EN 16728:2016+A2

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2020

ICS 23.020.35

Supersedes EN 16728:2016+A1:2018

English Version

**LPG equipment and accessories - Transportable refillable
LPG cylinders other than traditional welded and brazed
steel cylinders - Periodic inspection**

Équipements pour GPL et leurs accessoires - Bouteilles transportables et rechargeables pour GPL autres que celles en acier soudé et brasé - Contrôle périodique

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

This European Standard was approved by CEN on 19 April 2018 and includes Amendment 2 approved by CEN on 6 March 2020.

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.

CEN members are the national standards bodies of 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	4
Introduction	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions	7
4 Requirements for periodic inspection	9
4.1 General.....	9
4.2 Steel and aluminium cylinders.....	10
4.3 Over-moulded cylinders	10
4.4 Composite cylinders.....	10
4.5 Rejected cylinders.....	10
5 Inspections and tests	12
5.1 General.....	12
5.2 External visual inspection.....	12
5.2.1 Preparation for external visual inspection.....	12
5.2.2 Inspection procedure	12
5.2.3 Rejection criteria.....	13
5.3 Proof pressure test	13
5.3.1 General.....	13
5.3.2 Hydraulic proof pressure test.....	14
5.3.3 Pneumatic proof test and leak test	15
5.4 Check of the internal condition of the cylinder	16
5.4.1 Welded aluminium and steel cylinders of alternative design and construction	16
5.4.2 Check of the internal condition of composite cylinders.....	16
5.5 Inspection of cylinder threads	17
5.5.1 General.....	17
5.5.2 Internal threads.....	17
5.5.3 External threads	17
5.5.4 Damaged threads	17
5.6 Inspection of valves.....	17
6 Final operations.....	18
6.1 General.....	18
6.2 Valving.....	18
6.3 Tare mass.....	18
6.4 Marking.....	18
6.5 Purging.....	18
7 Repair of cylinders.....	18
8 Records	19
Annex A (normative) Specific requirements for external visual inspection for welded steel LPG cylinders in accordance with EN 14140 or equivalent standard	20
A.1 General.....	20
A.2 Procedure for establishing rejection criteria carbon steel cylinders.....	20
A.3 Rejection criteria for stainless steel cylinders.....	23

Annex B (normative) Specific requirements for external visual inspection of welded aluminium LPG cylinders.....	25
Annex C (normative) Specific requirements for visual inspection of composite LPG cylinders	28
C.1 Establishment of rejection criteria	28
C.1.1 General	28
C.1.2 Procedure	28
C.2 Examples of rejection criteria.....	28
C.2.1 Cylinders without a metallic liner	28
C.2.2 Cylinders with a metallic liner	33
Annex D (informative) Conditions for 15-year periodic inspection interval of welded steel cylinders manufactured before 1st January 2015	37
D.1 General	37
D.2 Concept of control.....	37
D.3 Conditions	37
Annex E (informative) Guidance on conditions for 10-year periodic inspection interval of composite cylinders.....	39
Annex F (normative) Specific Periodic inspection procedure for over-moulded cylinders (OMC)	40
F.1 General	40
F.1.1 Introduction.....	40
F.1.2 Valve	40
F.1.3 Marking and records	40
F.2 Periodic inspection	40
F.2.1 General	40
F.2.2 External visual inspection	42
F.2.3 Burst test.....	43
F.2.4 Supplementary tests.....	43
F.2.5 F.2.5 Statistical evaluation of test results – Method and minimum requirements	44
F.2.6 F.2.6 Measures if the acceptance criteria are not met.....	46
F.2.7 F.2.7 Periodic inspection tests reports and records	47
Annex G (informative) Example of an Over-Moulded Cylinder.....	48
Bibliography	50

European foreword

This document (EN 16728:2016+A2:2020) 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 October 2020, and conflicting national standards shall be withdrawn at the latest by October 2020.

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 includes Amendment 1 approved by CEN on 19 April 2018.

This document includes Amendment 2 approved by CEN on 6 March 2020.

This document ^{A1} supersedes EN 16728:2016 ^{A1} and deals with the periodic inspection requirements for transportable refillable LPG cylinders that are not covered by EN 1440.

^{A2} This document supersedes EN 16728:2016+A1:2018. ^{A2}

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

The start and finish of text introduced or altered by amendment is indicated in the text by tags ^{A2} ^{A2}.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

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

The new designs of LPG cylinders 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 experienced people.

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

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 European Standard is applicable to the following:

- welded steel LPG cylinders manufactured to an alternative design and construction, see EN 14140 or equivalent standard;
- welded aluminium LPG cylinders, see EN 13110 or equivalent standard;
- composite LPG cylinders, see EN 14427 or equivalent standard;
- over-moulded cylinders designed and manufactured according to EN 1442 or EN 14140, see Annex F.

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

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

EN 13110, *LPG equipment and accessories — Transportable refillable welded aluminium cylinders for liquefied petroleum gas (LPG) — Design and construction*

EN 14140:2014, *LPG equipment and accessories — Transportable refillable welded steel cylinders for LPG — Alternative design and construction*

EN 14427:2014, *LPG equipment and accessories — Transportable refillable fully wrapped composite cylinders for 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 4628-3:2003, *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 4628-3:2003)*

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 2859-1:1999, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 16269-6:2014, *Statistical interpretation of data — Part 6: Determination of statistical tolerance intervals*

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 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

minor repair

operations that include cleaning and replacement of components accessible without any dismantling of the valve (e.g. outlet seal, excess flow device) and that do not affect the integrity of the pressure receptacle 