

This document is a preview generated by EVS

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

| | |
|--|--|
| Käesolev Eesti standard EVS-EN 12819:2010 sisaldb Euroopa standardi EN 12819:2009 ingliskeelset teksti. | This Estonian standard EVS-EN 12819:2010 consists of the English text of the European standard EN 12819:2009. |
| Standard on kinnitatud Eesti Standardikeskuse 31.01.2010 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas. | This standard is ratified with the order of Estonian Centre for Standardisation dated 31.01.2010 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation. |
| Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kätesaadavaks tegemise kuupäev on 09.12.2009. | Date of Availability of the European standard text 09.12.2009. |
| Standard on kätesaadav Eesti standardiorganisatsionist. | The standard is available from Estonian standardisation organisation. |

ICS 23.020.30

Standardite reproduutseerimis- ja levitamisõigus kuulub Eesti Standardikeskusele

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

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
Aru 10 Tallinn 10317 Estonia; www.evs.ee; Telefon: 605 5050; E-post: info@evs.ee

Right to reproduce and distribute Estonian 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 permission in writing from Estonian Centre for Standardisation.

If you have any questions about standards copyright, please contact Estonian Centre for Standardisation:
Aru str 10 Tallinn 10317 Estonia; www.evs.ee; Phone: +372 605 5050; E-mail: info@evs.ee

EUROPEAN STANDARD

EN 12819

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2009

ICS 23.020.30

Supersedes EN 12819:2002, EN 12820:2002

English Version

LPG equipment and accessories - Inspection and requalification of LPG tanks greater than 13 m³

Équipements et accessoires GPL - Inspection et
requalification des réservoirs GPL d'un volume supérieur à
13 m³ pour gaz de pétrole liquéfiés (GPL)

Flüssiggas-Geräte und -Ausrüstungsteile - Überprüfung
und erneute Qualifizierung von Behältern für Flüssiggas
(LPG) größer als 13 m³

This European Standard was approved by CEN on 7 November 2009.

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



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

| | Page |
|---|-----------|
| Foreword..... | 4 |
| Introduction | 5 |
| 1 Scope | 6 |
| 2 Normative references | 6 |
| 3 Terms and definitions | 6 |
| 4 Safety | 7 |
| 4.1 Safety precautions..... | 7 |
| 4.2 Unsafe conditions..... | 7 |
| 4.3 Leaks..... | 7 |
| 5 Written scheme | 8 |
| 6 Tank inspection and requalification | 8 |
| 6.1 Routine inspection..... | 8 |
| 6.2 Periodic inspection..... | 9 |
| 6.3 Requalification | 9 |
| 6.3.1 Requalification of overground LPG tanks..... | 9 |
| 6.3.2 Requalification of underground LPG tanks | 9 |
| 6.3.3 Commissioning | 9 |
| 7 Inspection of tank and tank fittings | 9 |
| 7.1 Tank..... | 9 |
| 7.2 Tank fittings and immediate pipework | 10 |
| 7.3 Valve cover | 10 |
| 7.4 Bonding | 10 |
| 7.5 Pressure relief valves | 10 |
| 7.6 Pressure gauges | 10 |
| 7.7 Contents gauges..... | 11 |
| 7.8 Shut-off valves | 11 |
| 7.9 Studs, bolts, nuts, and washers..... | 11 |
| 7.10 Emergency valves..... | 11 |
| 7.11 Gaskets | 11 |
| 7.12 Pressure switch | 11 |
| 7.13 Temperature gauge..... | 11 |
| 7.14 Remotely operated valves | 11 |
| 7.15 Corrosion protection system | 11 |
| 7.16 Piers and foundations | 11 |
| 8 Competence | 11 |
| 8.1 Routine inspection..... | 12 |
| 8.2 Periodic inspection..... | 12 |
| 8.3 Requalification | 12 |
| 9 Records..... | 12 |
| 9.1 Tank data | 12 |
| 9.2 Test reports | 12 |
| Annex A (informative) Visual inspection..... | 13 |
| A.1 Internal and external visual inspections | 13 |
| A.2 Inspection techniques | 13 |
| A.2.1 External visual inspection | 13 |
| A.2.2 Internal visual inspection..... | 13 |

| | |
|---|----|
| A.2.3 Records | 13 |
| A.3 Additional inspection | 14 |
| Annex B (informative) Hydraulic pressure test..... | 15 |
| Annex C (normative) Acoustic emission testing..... | 16 |
| C.1 Scope | 16 |
| C.2 Testing procedure | 16 |
| C.3 Instrumentation | 16 |
| C.3.1 Sensors..... | 16 |
| C.3.2 Acquisition and evaluation system | 16 |
| C.4 Testing | 16 |
| C.4.1 Test instruction..... | 16 |
| C.4.2 Safety precautions | 17 |
| C.5 Sensor location..... | 17 |
| C.5.1 Above ground tanks..... | 17 |
| C.5.2 Underground or mounded tanks | 17 |
| C.5.3 Pressurisation..... | 19 |
| C.6 Data evaluation and analysis | 19 |
| C.6.1 Evaluation criteria | 19 |
| C.6.2 Real time control and stop criteria | 21 |
| C.6.3 Post test analysis | 21 |
| C.6.4 Tank grading | 21 |
| C.7 Data storage and reporting..... | 22 |
| Annex D (informative) Ultrasonic thickness test..... | 23 |
| D.1 General | 23 |
| D.2 Apparatus setting | 23 |
| D.3 Control measurement | 23 |
| D.4 Shell thickness measurements..... | 23 |
| D.5 End thickness measurements..... | 23 |
| D.6 Interpretation | 23 |
| D.7 Rejection criteria | 24 |
| Annex E (informative) Monitoring cathodic protection with sacrificial anodes for underground tanks | 25 |
| E.1 General | 25 |
| E.2 Records | 25 |
| E.3 Procedure | 25 |
| E.4 Measurement of the galvanic current..... | 25 |
| E.5 Measurement of the potential difference of the tank to the reference electrode..... | 25 |
| E.6 Results..... | 26 |
| Annex F (informative) Monitoring cathodic protection by impressed current for underground tanks | 27 |
| F.1 General | 27 |
| F.2 Apparatus | 27 |
| F.3 Conditions | 27 |
| F.4 Isolation resistance of the coating | 27 |
| F.4.1 Procedure | 27 |
| F.4.2 Calculation | 28 |
| F.5 Results..... | 28 |
| F.6 Checking intervals..... | 28 |
| Annex G (informative) Example of a test report..... | 29 |
| Annex H (informative) A-deviations | 30 |
| Bibliography..... | 31 |

Foreword

This document (EN 12819:2009) has been prepared by Technical Committee CEN/TC 286 "Liquefied petroleum gas equipment and accessories", the secretariat of which is held by NSAI.

This document supersedes EN 12819:2002 and EN 12820:2002.

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 2010, and conflicting national standards shall be withdrawn at the latest by June 2010.

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.

Users of this EN, prepared in the field of application of Article 118A of the EC Treaty, should be aware that standards have no formal legal relationship with Directives that may have been made under Article 118A of the Treaty. In addition, national legislation in the Member states may contain more stringent requirements than the minimum requirements of a Directive based on Article 118A. Information on the relationship between the national legislation implementing Directives based on Article 118A and this EN may be given in a national foreword of the national standard implementing this EN.

The main modifications concern the following:

- merging of two European Standards: EN 12819:2002 and EN 12820:2002;
- improvement of Annex C which becomes normative;
- a new clause: normative references.

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, 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 and the United Kingdom.

Introduction

Periodic and routine inspection and requalification regimes for LPG tanks greater than 13 m³ have developed in various countries in different ways that range from defined to variable inspection periods with requalification regimes achieved by various methods. This European Standard for periodic and routine inspection and requalification is based on European countries' legislation and codes of practice and industries' codes of practice. In addition, use of LPG in different applications has encouraged the industry to approach the requirements for routine and periodic inspection and requalification in different ways for each application.

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 execution of its provisions is entrusted to appropriately qualified and experienced people.

1 Scope

This European Standard specifies requirements for:

- a) routine inspection, periodic inspection and requalification of fixed LPG storage tanks of sizes greater than 13 m³, and associated fittings;
- b) marking tanks and/or keeping records, as appropriate, as a result of routine inspection, periodic inspection and requalification.

This European Standard excludes refrigerated storage.

2 Normative references

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

EN 1330-9, *Non-destructive testing — Terminology — Part 9: Terms used in acoustic emission testing*

EN 13477-1, *Non-destructive testing — Acoustic emission — Equipment characterisation — Part 1: Equipment description*

EN 13447-2, *Non-destructive testing — Acoustic emission — Equipment characterisation — Part 2: Verification of operating characteristic*

EN 13554, *Non-destructive testing — Acoustic emission — General principles*

EN 14584, *Non-destructive testing — Acoustic emission — Examination of metallic pressure equipment during proof testing — Planar location of AE sources*

3 Terms and definitions

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

3.1

periodic inspection

external inspection of the visible parts of a tank and its fittings

3.2

routine inspection

external inspection of the visible parts of a tank and its fittings, carried out more frequently than periodic inspections

3.3

requalification

inspection/test carried out at intervals, in order to confirm that a tank is fit for a further period of service

3.4

competent body

person or corporate body, defined by a national competent authority, that, by appropriate qualification, training, experience, and resources, is able to make objective judgements related to inspection and testing of pressure equipment in LPG service