

SLOVENSKI STANDARD

SIST EN 13799:2012

01-maj-2012

Nadomešča:

SIST EN 13799:2003

SIST EN 13799:2003/AC:2007

Oprema in pribor za utekočinjeni naftni plin (UNP) - Kazalniki nivoja v posodah za utekočinjeni naftni plin (UNP)

LPG equipment and accessories - Contents gauges for Liquefied Petroleum Gas (LPG) tanks

iTeh STANDARD PREVIEW

Flüssiggas-Geräte und -Ausrüstungsteile - Füllstandsanzeiger für Behälter für Flüssiggas (LPG)

[SIST EN 13799:2012](https://standards.iteh.ai/catalog/standards/sist/068cf21-a66c-4e27-8687-af55af12b04d/sist-en-13799-2012)

Équipements et accessoires GPL - Jauges de niveau pour les réservoirs de GP

Ta slovenski standard je istoveten z: EN 13799:2012

ICS:

23.020.10

Nepremične posode in
rezervoarji

Stationary containers and
tanks

SIST EN 13799:2012

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 13799:2012

<https://standards.iteh.ai/catalog/standards/sist/0f68cf21-ae6c-4e97-8687-af55af12b04d/sist-en-13799-2012>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13799

March 2012

ICS 23.020.01

Supersedes EN 13799:2002

English Version

**LPG equipment and accessories - Contents gauges for
Liquefied Petroleum Gas (LPG) pressure vessels**

Équipements et accessoires GPL - Jauges de niveau pour
les réservoirs de GP

Flüssiggas-Geräte und Ausrüstungsteile -
Füllstandsanzeiger für Druckbehälter für Flüssiggas (LPG)

This European Standard was approved by CEN on 14 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.

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

SIST EN 13799:2012

<https://standards.iteh.ai/catalog/standards/sist/0f68cf21-ae6c-4e97-8687-af55af12b04d/sist-en-13799-2012>



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	7
4 Operating conditions	8
5 Materials	8
5.1 General.....	8
5.2 Metallic materials	8
5.3 Non-metallic components	9
5.4 Lubricants, sealants and adhesives	9
6 Design – General requirements.....	9
6.1 General.....	9
6.2 Seals.....	10
6.3 Springs.....	10
6.4 Threads	10
6.5 Flanges	11
7 Design– Specific requirements	11
7.1 Contents gauge	11
7.1.1 Float gauge	11
7.1.2 Rotary gauge	11
7.1.3 Fixed liquid level gauge	11
7.1.4 Slip tube gauge	12
7.2 Dials for contents gauges	12
8 Design testing	12
8.1 General.....	12
8.2 Over-torquing deformation test.....	13
8.3 External tightness test	14
8.4 Internal tightness test	14
8.5 Endurance test	15
8.6 Pressure strength test.....	15
8.7 Stress cracking test.....	15
8.7.1 General.....	15
8.7.2 Mercurous nitrate immersion test.....	16
8.7.3 Moist ammonia air stress cracking test	16
8.8 Float pressure test.....	16
8.9 Dimensional inspection	16
8.10 Function test	16
8.11 Vacuum test.....	16
8.12 Float Test	16
8.13 Accuracy assessment	17
9 Production testing and inspection.....	17
10 Marking	17
11 Documentation.....	17
Annex A (normative) Float gauge flange and gasket dimensions	19

iTech STANDARD PREVIEW
(standards.itech.ai)

SIST EN 13799:2012

<https://standards.itech.ai/catalog/standards/sist/0f08c121-ac0c-4e97-8087-a155a112b04d/sist-en-13799-2012>

Annex B (normative) Special low temperature requirements	22
Annex C (normative) Production testing and inspection	23
Annex D (informative) Vibration Testing	24
D.1 General	24
D.2 Test samples	24
D.3 Test method	24
D.4 Criteria for passing the test.....	25
Annex E (informative) Environment checklist.....	26
Bibliography	27

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 13799:2012](https://standards.iteh.ai/catalog/standards/sist/0f68cf21-ae6c-4e97-8687-af55af12b04d/sist-en-13799-2012)

<https://standards.iteh.ai/catalog/standards/sist/0f68cf21-ae6c-4e97-8687-af55af12b04d/sist-en-13799-2012>

Foreword

This document (EN 13799:2012) has been prepared by Technical Committee CEN/TC 286 "LPG 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 document supersedes EN 13799:2002.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

For the purposes of this standard, contents gauges are considered a pressure accessory in accordance with the Pressure Equipment Directive 97/23/EC in that they have a function additional to that of containing pressure. However, as they have a volume less than 0,1 l and a maximum allowable pressure (PS) of 25 bar, they are designed and manufactured in accordance with sound engineering practice of a Member State in order to ensure safe use.

This document is considered as a supporting European Standard for the Pressure Equipment Directive 97/23/EC.

This document has been submitted for reference into the RID and/or in the technical annexes of the ADR.

The major changes to this revision include:

- scope extended to include transportable equipment;
- gauge graduations and precision included;
- overfill Protection Device is deleted, now included in EN 13175;
- test requirement is included for non-metallic floats;
- torque test values have been changed;
- vacuum test and float test have been introduced;
- Annex C, production testing has been introduced;
- Annex D, vibration testing has been introduced;
- Annex E, environmental checklist has been introduced.

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 the United Kingdom.

Introduction

Protection of the environment is a key political issue in Europe and around the world. It is described here in its broadest sense. However, the total life cycle aspects of a product on the environment for example is what is meant. This includes expenditure of energy during all phases: mining of raw materials, fabrication, packaging, distribution, use, scrapping, recycling of materials, etc.

NOTE Annex E indicates which clauses in this European Standard address environmental issues.

Provisions have to be restricted to a general guidance. Limit values are specified in national laws. It is recommended that companies using this standard develop an environmental management policy. For guidance see ISO 14000 series.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 13799:2012](https://standards.iteh.ai/catalog/standards/sist/0f68cf21-ae6c-4e97-8687-af55af12b04d/sist-en-13799-2012)

<https://standards.iteh.ai/catalog/standards/sist/0f68cf21-ae6c-4e97-8687-af55af12b04d/sist-en-13799-2012>

1 Scope

This European Standard specifies minimum requirements for design and testing of contents gauges, which are directly connected to LPG transportable pressure vessels, LPG drums, LPG cylinders and static LPG pressure vessels above 0,5 l water capacity excluding those used for automotive containers. This European Standard does not apply to refineries or other process plants.

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 549:1994, *Rubber materials for seals and diaphragms for gas appliances and gas equipment*

EN 751 -1:1996, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 1: Anaerobic jointing compounds*

EN 751-2:1996, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 2: Non-hardening jointing compounds*

EN 751-3:1996, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 3: Unsintered PTFE tapes*

EN 1092-1:2007, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*

EN 1503-1:2000, *Valves — Materials for bodies, bonnets and covers — Part 1: Steels specified in European Standards*

EN 1503-2:2000, *Valves — Materials for bodies, bonnets and covers — Part 2: Steels other than those specified in European Standards*

EN 1503-3:2000, *Valves — Materials for bodies, bonnets and covers — Part 3: Cast irons specified in European Standards*

EN 1503-4:2002, *Valves — Materials for bodies, bonnets and covers — Part 4: Copper alloys specified in European Standards*

EN 1563:1997, *Founding — Spheroidal graphite cast irons*

EN 10270-3:2001, *Steel wire for mechanical springs — Part 3: Stainless spring steel wire*

EN 12165:2011, *Copper and copper alloys — Wrought and unwrought forging stock*

EN 12420:1999, *Copper and copper alloys — Forgings*

EN 13906-1:2000, *Cylindrical helical springs made from round wire and bar — Calculation and design — Part 1: Compression springs*

EN 60079-0, *Explosive atmospheres — Part 0: Equipment — General requirements*

ISO 301:2006, *Zinc alloy ingots intended for casting*

ISO 1817:2011, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

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

ISO 6957:1988, *Copper alloys — Ammonia test for stress corrosion resistance*

ANSI/ASME B1.20.1 – 1983, *Pipe threads, general purpose (inch); issued by American National Standards Institute in 1983*

3 Terms and definitions

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

3.1

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

3.2

contents gauge

device to indicate the liquid level or contents in a pressure vessel

3.2.1

float gauge

device to indicate the content of a vessel by means of a float on the liquid surface within the vessel

3.2.2

rotary gauge

device which operates through a rotating action in order to assess the liquid level in a vessel by means of temporarily venting a limited amount of LPG, whereupon the change from liquid to vapour is detected

3.2.3

fixed liquid level gauge

control device, such as a dip tube in combination with a vent valve to indicate when a predetermined liquid level has been reached or surpassed

3.2.4

slip tube

device which operates through a linear action in order to assess the liquid level in a pressure vessel by means of temporarily venting a limited amount of LPG, where upon the change from liquid to vapour is detected

3.3

external tightness

resistance to leakage through the fitting to or from the atmosphere

3.4

internal tightness

resistance to leakage to atmosphere across the valve seat or any other pressure containing component when the valve is closed

3.5

maximum allowable pressure

maximum pressure for which the equipment is designed

EN 13799:2012 (E)**3.6****nominal diameter DN**

numerical designation of size, in millimetres, which is common to all components in a piping system other than components designated by outside diameters or by thread size

Note 1 to entry: It is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions. The nominal size is designated by DN followed by a number.

3.7**pressure vessel**

assembly of the pressure-retaining envelope (including the openings and their closures) and non-pressure-retaining parts attached directly to it

4 Operating conditions

Contents gauges designed in accordance with this standard shall be suitable for the following conditions:

- a minimum operating temperature of -20 °C. In service, temperatures below this can be encountered during short periods, for example, when filling;
- for some parts of Europe and certain applications, temperatures lower than -20 °C can be encountered, for these conditions the requirements of Annex B shall be met;
- the maximum operating temperature is 65 °C;
- the minimum pressure to which a gauge is normally exposed is 0 bar gauge. Vacuum conditions on the gauge, arising from butane at low temperature or evacuation of the pressure vessel can expose the device to a vacuum of 0,05 bar absolute.

The maximum allowable pressure for a contents gauge is 25 bar.

5 Materials**5.1 General**

5.1.1 All materials in contact with LPG shall be physically and chemically compatible with LPG under all the normal operating conditions for which the contents gauge is intended to be used.

5.1.2 Materials for gauge components shall be selected to give adequate strength in service. Materials selected shall adequately protect against other modes of failure such as atmospheric corrosion, brass dezincification, stress corrosion or other material failure.

5.1.3 Alternative materials to those listed in 5.2 are not precluded, providing they comply with a standard or specification that ensures control of chemical and physical properties, and quality appropriate to the end use.

5.2 Metallic materials

5.2.1 Metallic materials for gauges shall be steel, stainless steel, copper alloys, aluminium alloys, zinc alloys or other suitable materials.

5.2.2 For pressure containing components steel and stainless steels shall comply with EN 1503-1:2000 or EN 1503-2:2000, cast iron shall comply with EN 1503-3:2000 and copper alloys shall comply with EN 1503-4:2002.

5.2.3 Materials for steel flanges shall be in accordance with EN 1092-1:2007.

5.2.4 Stainless steel for components shall contain not less than 16 % chromium, and not less than 7 % nickel.

5.2.5 Springs shall be manufactured from stainless steel in accordance with EN 10270-3:2001 or a material with an adequate resistance to corrosion.

5.2.6 Hot stamped brass shall be non-porous and suitable for machining or other processing. Lead brass shall be CW614N or CW617N in accordance with EN 12420:1999 and EN 12165:2011. Sand-cast brass shall not be used. Cold drawn brass rods shall only be used for machining after adequate testing for internal cracking, porosity or other inclusions and shall be heat treated if required. Components produced from stamping brass shall not exhibit cold shuts also known as folds, or surface defects.

5.2.7 Components manufactured from hot stamped brass or contents gauge bodies made of drawn brass or machined from brass rod shall be capable of withstanding, without cracking, the stress-cracking test.

5.2.8 Spheroidal graphite cast iron shall comply with EN 1563:1997 and amendments, with an elongation at fracture of more than 18 %. Other ductile irons or cast irons shall not be used.

5.2.9 ZnAl4 and ZnAl4Cu1 shall be in accordance with ISO 301:2006.

5.2.10 Castings shall be free from inclusions and surface defects which could adversely affect the strength, leak tightness or performance of the contents gauge.

5.2.11 For guidance on the choice of metallic materials, see EN ISO 11114-1:1997.

5.3 Non-metallic components

5.3.1 For guidance on the choice of non-metallic materials, see EN ISO 11114-2:2000.

5.3.2 Except for floats, all non-metallic materials in contact with LPG shall not distort, harden or adhere to the body or seat face to such an extent as to impair the function of the gauge.

All rubber materials except floats shall also comply with the requirements of EN 549:1994. The resistance to ozone test in EN 549:1994 shall only be carried out where gaskets/seals are exposed to atmosphere.

5.3.3 The buoyancy of the float shall not be adversely affected by the LPG. Non-metallic floats shall be tested in accordance with 8.12 for resistance to gas and shall meet the following requirements:

— change in mass after immersion ± 10 %;

— change in mass after drying (${}^5_{-10}$) %.

5.4 Lubricants, sealants and adhesives

Where used on threads and seals; lubricants, sealants, and adhesives shall be compatible with LPG and not interfere with the operation of the contents gauge. Sealants shall comply with EN 751-1:1996, EN 751-2:1996 or EN 751-3:1996.

6 Design – General requirements

6.1 General

6.1.1 Moving parts shall have sufficient clearance to ensure freedom of movement under all normal conditions of service. Means of guidance shall be provided to ensure correct operation.