



SLOVENSKI STANDARD
oSIST prEN 13799:2020
01-maj-2020

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

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

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

Équipements et accessoires GPL - Jauges de niveau pour les réservoirs de gaz de pétrole liquéfié (GPL)

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ICS:

23.020.10	Nepremične posode in rezervoarji	Stationary containers and tanks
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 13799

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Will supersede EN 13799:2012

English Version

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

Equipements pour GPL et leurs accessoires - Jauges de
niveau pour les réservoirs de gaz de pétrole liquéfié
(GPL)

Füllstandsanzeiger für Druckbehälter für Flüssiggas
(LPG) - Füllstandsanzeiger für Flüssiggasbehälter

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 286.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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

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prEN 13799:2020 (E)**European foreword**

This document (prEN 13799:2020) has been prepared by Technical Committee CEN/TC 286 “LPG equipment and accessories”, the secretariat of which is held by NSAI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13799:2012.

The major changes to this revision include:

- revision to operational conditions;
- introduction of requirements for rubber material;
- introduction of telemetry requirements;
- introduction of an accuracy test;
- introduction of gauge repeatability requirements.

This document has been submitted for reference in

- the RID and
- the technical annexes of the ADR

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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 document has been prepared under a standardization request 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 2014/68/EU [1] in that they have a function additional to that of containing pressure.

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 document 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.

Protection of the environment is a key political issue in Europe and elsewhere. For TC 286 this is covered in CEN/TS 16765 [4] LPG equipment and accessories - Environmental considerations for CEN/TC 286 standards, and this Technical Specification should be read in conjunction with this standard.

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prEN 13799:2020 (E)**1 Scope**

This document 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 document includes minimum requirements for the safe interchangeability of telemetry equipment, which is either integral in or additional to the contents gauge.

This document does not apply to refineries or other process plants.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 549:2019, *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 1092-1:2018, *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 1563:2018, *Founding — Spheroidal graphite cast irons*

EN 10270-3:2011, *Steel wire for mechanical springs — Part 3: Stainless spring steel wire*

EN 12164, *Copper and copper alloys - Rod for free machining purposes*

EN 12165, *Copper and copper alloys - Wrought and unwrought forging stock*

EN 12420, *Copper and copper alloys - Forgings*

EN 13906-1:2013, *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 castings*

ISO 1817:2015, *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*

ISO 7049, *Cross-recessed pan head tapping screws*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

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3.1

Liquefied Petroleum Gas

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LPG

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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

prEN 13799:2020 (E)**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

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

3.8**type test**

test or series of tests conducted to prove that the design meets the requirements of this document

4 Operating conditions

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

- a minimum operating temperature of $-20\text{ }^{\circ}\text{C}$;
- a minimum operating temperature of $-40\text{ }^{\circ}\text{C}$ for those parts of Europe where contents gauges are subject to more severe temperature conditions. The material and design shall be shown to be satisfactory for operations under these conditions and shall meet the requirements of Annex B;
- the maximum operating temperature is $65\text{ }^{\circ}\text{C}$;
- 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 shall be 30 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.

5.1.4 Optional equipment directly connected to the gauge shall not affect the integrity of the gauge and its function. Dials/inserts shall be sealed to prevent water ingress into the dial/insert. The contents gauge shall be designed to ensure that water ingress between the dial/insert and gauge body is avoided or does not interfere with the gauge operation if it freezes.

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 1092-1:2018.

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 10270-3:2011 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. Leaded brass shall be CW614N in accordance with EN 12164 or CW617N in accordance with EN 12420 and EN 12165. 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 1563:2018 and amendments, with an elongation at fracture of more than 18 %. Other ductile irons or cast irons shall not be used.

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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 11114-1:2012

5.3 Non-metallic components

5.3.1 For guidance on the choice of non-metallic materials, see EN ISO 11114-2:2013

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.

5.3.3 Rubber materials, with the exception of floats, in contact with LPG, for temperatures of – 20C (–40C for low temperature applications) to + 65C, shall meet the requirements of EN 549 for resistance to:

- a) gas (n-pentane test);
- b) lubricants;
- c) ageing;
- d) compression;
- e) ozone (where the material is exposed to the atmosphere);
- f) condensate/liquid phase of combustible gases (liquid B test)

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5.3.4 The buoyancy of the float shall not be adversely affected by the LPG. Non-metallic floats shall be tested in accordance with 8.14 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.

6.1.2 All components necessary for the correct function of the device shall be secured to prevent unintentional disassembly during normal operation.