

### SLOVENSKI STANDARD oSIST prEN 13760:2020

01-marec-2020

#### Oprema in pribor za utekočinjeni naftni plin (UNP) - Sistem za polnjenje utekočinjenega naftnega plina za lahka in težka vozila - Šoba, preskuševalne zahteve in mere

LPG equipment and accessories - Automotive LPG filling system for light and heavy duty vehicles - Nozzle, test requirements and dimensions

Flüssiggas-Geräte und Ausrüstungsteile - Füllsysteme an Autogasanlagen für leichte und schwere Fahrzeuge - Anschlussstutzen, Prüfanforderungen und Abmessungen (standards.iteh.ai)

Équipements GPL et leurs accessoires - Dispositif de remplissage GPL pour véhicules légers et poids lourds - Pistolet: conditions d'essais et dimensions https://standards.iteh.a/catalog/standards/sist/ed4a7/07-37ad-4547-a0cc-

1e1755ae23cf/osist-pren-13760-2020

Ta slovenski standard je istoveten z: prEN 13760

#### ICS:

43.060.40Sistemi za gorivoFuel systems75.200Oprema za skladiščenje<br/>nafte, naftnih proizvodov in<br/>zemeljskega plinaPetroleum products and<br/>natural gas handling<br/>equipment

oSIST prEN 13760:2020

en,fr,de



### iTeh STANDARD PREVIEW (standards.iteh.ai)

oSIST prEN 13760:2020 https://standards.iteh.ai/catalog/standards/sist/ed4a7f07-37ad-4547-a0cc-1e1755ae23cf/osist-pren-13760-2020

#### oSIST prEN 13760:2020

# EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

## DRAFT prEN 13760

ICS

March 2020

Will supersede EN 13760:2003

**English Version** 

### LPG equipment and accessories - Automotive LPG filling system for light and heavy duty vehicles - Nozzle, test requirements and dimensions

Équipements GPL et leurs accessoires - Dispositif de remplissage GPL pour véhicules légers et poids lourds -Pistolet: conditions d'essais et dimensions Flüssiggas-Geräte und Ausrüstungsteile - Füllsysteme an Autogasanlagen für leichte und schwere Fahrzeuge -Anschlussstutzen, Prüfanforderungen und Abmessungen

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 60.2020

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, Eatvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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.

**Warning** : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

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

© 2020 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. prEN 13760:2020 E

#### oSIST prEN 13760:2020

#### prEN 13760:2020 (E)

### Contents

#### Page

European foreword				
1	Scope	4		
2	Normative references	4		
3	Terms and definitions	5		
4	Design and construction requirements	6		
4.1	General	6		
4.2	Service gasket	7		
4.3	Specific requirements			
4.4	Requirements for connection and disconnection by rotation			
4.5	Requirements for connection and disconnection by movement in the longitudinal			
	axis of the filling nozzle (push and pull)	8		
4.6	Requirements for lever operation	8		
4.7	Requirements for non-metallic materials	8		
5	Test procedures iTeh STANDARD PREVIEW	8		
5.1	General	8		
5.2	Endurance test	10		
5.3	Overpressure test	11		
5.4	External leak tests	11		
5.5	Electrical continuity test of the filling hozzleards/sist/ed4a7f07-37ad-4547-a0cc-	13		
5.6	Drop test	13		
5.7	Freezing test	14		
5.8	Corrosion resistance test	15		
5.9	Temperature cycle test	15		
5.10	LPG compatibility test (for rubber materials)	16		
5.11	Ozone ageing test	16		
5.12	Resistance to dry heat test	16		
5.13	Oxygen ageing	17		
6	Markings	17		
Annex A (normative) Critical dimensions of the filling nozzles				
Annex B (normative) Critical dimensions of the filling units				
Annex ZA (informative) Relationship between this European Standard and the essential				
	requirements of EU Directive 2014/34/EU aimed to be covered	22		
Bibliog	Bibliography			

#### **European foreword**

This document (prEN 13760:2020) 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 13760:2003.

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.

This document does not deal with the essential safety requirements of the DIRECTIVE 2014/68/EU of the European Parliament and of the Council of 15 May 2014 on the harmonization of the laws of the Member States relating to the making available on the market of pressure equipment.

This document addresses the essential health and safety requirements of DIRECTIVE 2014/34/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonization of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres. 11 CII 51 AI

In the PED the nozzle is classified as a "pressure accessory". It is intended to be connected to a hose, which is classified as "piping". oSIST prEN 13760:2020

- The category 1 limit is defined in Annex 2 Table 6 of the PED and is a function of the product of DN and PS with a limit of 1 000.
- Because the design pressure (PS) in this document is 2 500 kPa and the DN of the intended hose is less than 40, the figure of 1 000 in Table 6 is not reached.

#### 1 Scope

This document specifies the minimum design, construction, test requirements and the critical dimensions for filling nozzles for the dispensing of automotive Liquefied Petroleum Gas (LPG) to vehicles of categories M and N, as defined in [1], that are fitted with the Euro filling unit (light duty or heavy duty).

#### 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 589:2018, Automotive fuels - LPG - Requirements and test methods

EN 12806:2003, Automotive liquefied petroleum gas components - Other than containers

EN 1762:2018, Rubber hoses and hose assemblies for liquefied petroleum gas, LPG (liquid or gaseous phase), and natural gas up to 25 bar (2,5 MPa) - Specification

EN ISO 80079-36:2016, Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic method and requirements (ISO 80079-36:2016)

EN ISO 11114-2:2013, Gas cylinders - Compatibility of cylinder and valve materials with gas contents - Part 2: Non-metallic materials (ISO 11114-2:2013) and ards.iteh.ai)

EN ISO 9227:2017, Corrosion tests in artificial atmospheres - Salt spray tests (ISO 9227:2017)

EN IEC 60068-2-52:2018, Environmental testing - Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)

ISO 188:2011, Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests

ISO 1431-1:2012, Rubber, vulcanized or thermoplastic — Resistance to ozone cracking — Part 1: Static and dynamic strain testing

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

#### 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:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

#### 3.1

#### pressure

gauge pressure, unless otherwise stated

#### 3.2

#### design pressure

maximum pressure at which the filling nozzle may be used

#### 3.3

#### test pressure

pressure to which the component, or an assembly of components, is subjected during the tests

#### 3.4

#### working pressure

pressure under normal operating conditions ARD PREVIEW

#### 3.5

### (standards.iteh.ai)

#### filling nozzle

mechanical system, fitted to the hose<u>sof</u> the dispensing system, consisting of a filling nozzle body, operating mechanism, including sealing elements and a service gasket if nequired

1e1755ae23cf/osist-pren-13760-2020

#### 3.6

#### light duty vehicle filling nozzle

filling nozzle intended to fuel vehicles fitted with the K 15 filling unit

#### 3.7

#### heavy duty vehicle filling nozzle

filling nozzle intended to fuel vehicles fitted with the heavy duty vehicle Euro filling unit

#### 3.8

#### latching mechanism

component allowing the locking or unlocking operation of the filling nozzle to the filling unit

#### 3.9

#### service gasket

replaceable gasket ensuring tightness of the connection between the filling nozzle outlet and the filling unit inlet

#### 3.10

#### torque for connection

torque required to connect the filling nozzle to the filling unit

#### 3.11

#### torque for disconnection

torque required to disconnect the filling nozzle from the filling unit

#### 3.12

#### push-on force

force applied in the longitudinal axis of the filling unit to connect the filling nozzle to the filling unit

#### 3.13

#### pull-off force

force applied in the longitudinal axis of the filling unit to disconnect the filling nozzle from the filling unit

#### 3.14

#### grip

area where the filling nozzle is held for connection or disconnection

#### 3.15

#### filling unit

device installed on the outside of the vehicle to receive the filling nozzle and enable the filling of the LPG container

Note 1 to entry: The filling nozzle as prescribed in this standard is only intended to be used with the Euro filling unit.

#### 4 Design and construction requirements

#### 4.1 General

### iTeh STANDARD PREVIEW

Any non-electrical equipment, intended for use in a potentially explosive atmosphere, shall comply with the requirements of EN ISO 80079-36:2016. The nozzle shall be designed and constructed according to good engineering practice and in conformity with the required categories for group II equipment to ensure avoidance of any ignition source.

To classify the category of the equipment it shall be subjected to an ignition hazard assessment in accordance with EN ISO 80079-36:2016.

If the nozzle does not contain any effective ignition sources in normal operation it shall be classified as Group II, gas group IIA, category 3.

The design of the filling nozzle shall ensure that:

- a) it is suitable for use with automotive LPG as specified in EN 589:2018;
- b) it is compatible with the relevant filling unit as specified in EN 12806 in accordance with Annex B;
- c) entrapment of fingers and/or cold burns are not possible;
- d) it is not possible to open the valve in the filling nozzle if the filling nozzle is not properly locked and sealed on the filling unit;
- e) it locks in the connected position;
- f) it is not possible to disconnect the filling nozzle from the filling unit unless the filling nozzle valve is closed;
- g) blocking due to internal freezing does not occur, according to 5.7;
- h) it is tolerant to the effect of dirt;

- i) it will withstand a torque of 150 % of the mounting torque specified by the manufacturer without damage;
- j) the electrical resistance is  $1 \text{ k}\Omega$  maximum;
- k) the materials in contact with LPG are LPG-compatible;
- l) the external surfaces of the filling nozzle are corrosion resistant or protected against corrosion and are made of materials that do not cause sparks when dropped on a surface;
- m) the minimum lifetime is 100 000 cycles;
- n) the climate conditions of the geographic area where they will operate are taken into account as follows:
  - Moderate Climate conditions: -20 °C to +65 °C
  - Cold Climate conditions: -40 °C to +65 °C;
- o) the design pressure is 2 500 kPa;
- p) a locking mechanism is incorporated;
- q) the nozzle is provided with a means to securely attach it to the delivery hose.

### 4.2 Service gasket (standards.iteh.ai)

The service gasket between the filling nozzle and the filling unit, if required, shall be fitted in the nozzle.

Changing the service gasket shall not result in any LPG release. 37ad-4547-a0ccle1755ae23cf/osist-pren-13760-2020 The minimum lifetime of the service gasket shall be 20 000 cycles.

#### **4.3 Specific requirements**

#### 4.3.1 Light duty vehicle filling nozzle

The release of LPG during disconnection shall be less than 1 cm<sup>3</sup> liquid.

The maximum weight of the filling nozzle shall be 2 kg (including swivel, if fitted).

The external diameter of the filling nozzle shall not exceed 54 mm over a length of at least 82 mm measured from the normal attachment point of the vehicle connector as shown in Figure A.1. This includes protruding ancillaries in any position.

The maximum grip diameter of the filling nozzle shall be 60 mm.

The nozzle shall be designed for one hand operation for connection and disconnection.

#### 4.3.2 Heavy duty vehicle filling nozzle

The release of LPG during disconnection shall be less than 1 cm<sup>3</sup> liquid.

The maximum weight of the filling nozzle shall be 3 kg (including swivel, if fitted).

The external diameter of the outlet side of the filling nozzle shall not exceed 80 mm over a length of at least 64 mm as shown in Figure A.2. This includes protruding ancillaries in any position.

#### 4.4 Requirements for connection and disconnection by rotation

The rotation angle in the longitudinal axis shall not exceed 120 degrees.

The maximum torque for connection and disconnection shall be:

- 1,5 Nm for the light duty vehicle filling nozzle,
- 25 Nm for the heavy duty vehicle filling nozzle,

at any pressure up to 2 500 kPa in the filling nozzle.

# 4.5 Requirements for connection and disconnection by movement in the longitudinal axis of the filling nozzle (push and pull)

The maximum push-on force shall be 100 N, at any pressure up to 2 500 kPa in the filling nozzle.

The maximum pull-off force shall be 50 N, at a pressure of 2 500 kPa.

#### 4.6 Requirements for lever operation

The force to close the lever, applied at the centre of the grip area of the lever, shall be 100 N maximum at any pressure up to 1 500 kPa in the filling nozzle.

Provision shall be made to enable the lever or the whole filling nozzle to freely rotate over an angle of 360 degrees around the longitudinal axis of the filling nozzle or the filling hose.

#### 4.7 Requirements for non metallic materials ARD PREVIEW

All elastomer materials in contact with **LPG shall Ge compatible** with LPG in accordance with EN ISO 11114-2 and shall not distort, harden or adhere to the body or seat face to such an extent as to impair the function of the valve. Rubber materials shall conform to the requirements of EN 549:2019, see 5.10. https://standards.iteh.ai/catalog/standards/sist/ed4a7f07-37ad-4547-a0cc-1e1755ae23cf/osist-pren-13760-2020

#### 5 Test procedures

#### 5.1 General

For type testing the following samples shall be used:

- 1. 4 (four) fully assembled samples of the filling nozzle;
- 2. 2 (two) disassembled samples of the filling nozzle; and
- 3. 7 (seven) sets of non-metallic components.

The type tests shall be performed on the respective samples according to Table 1, in that given order.

Test	Test samples	Clause
Electrical continuity	Fully assembled samples 1, 2 and 3	5.5
Endurance	Fully assembled samples 1, 2 and 3	5.2
Overpressure	Fully assembled samples 1, 2 and 3	5.3
External leak	Fully assembled samples 1, 2 and 3	5.4
Drop test	Fully assembled samples 1, 2 and 3	5.6
Freezing	Fully assembled samples 1, 2 and 3	5.7
Electrical continuity	Fully assembled samples 1, 2 and 3	5.5
Corrosion resistance	Disassembled sample 1	5.8
Temperature cycle	Disassembled sample 2	5.9
LPG compatibility test (for rubber materials) <u>oSI</u>	Set of non-metallic ST components sample 1	5.10
https://standards.iteh.avcata Ozone ageing <sup>1e1755</sup> ae	og/standards/sist/ed4a/10/-3/ad-45 23cf/osist-pien-19/709-2020 components sample 5	47-a0cc- 5.11
Resistance to dry heat	Set of non-metallic components sample 6	5.12
Oxygen ageing	Set of non-metallic components sample 7	5.13

Table 1 — Type tests

The tolerances for test temperatures and pressures shall be:

- for low temperature:  ${}^0_{-5} \, {}^\circ C$  ;
- for high temperature:  ${}^{+5}_{0} {}^{\circ}C$  ;
- for 20 °C:  $^{+5}_{-5}$  °C ;
- test pressures:  $\pm$  10 % of the stated value with a maximum of 100 kPa.

All samples shall pass all the tests, or the design shall be rejected.

For production testing, all samples shall be subjected to the tests in Table 2.