SLOVENSKI STANDARD
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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

Équipements GPL et leurs accessoires - Dispositif de remplissage GPL pour véhicules légers et poids lourds - Pistolet: conditions d'essais et dimensions

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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

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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.

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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

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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.*

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”.

— 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)*

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

3.5
filling nozzle
mechanical system, fitted to the hose of the dispensing system, consisting of a filling nozzle body, operating mechanism, including sealing elements and a service gasket if required

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

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 kΩ 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

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.

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^3 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^3 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

All elastomer materials in contact with LPG shall be 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.

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.

Table 1 — Type tests

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)	Set of non-metallic components sample 1	5.10
Ozone ageing	Set of non-metallic components sample 5	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

The tolerances for test temperatures and pressures shall be:

— for low temperature: $^{0}_{-5}$ °C ;

— for high temperature: $^{+5}_{0}$ °C ;

— for 20 °C: $^{+5}_{-5}$ °C ;

— test pressures: ± 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.