SLOVENSKI STANDARD
SIST EN 13012:2012

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Nadomešča:
SIST EN 13012:2002

Bencinski servisi - Izdelava in lastnosti točilnih ventilov, vgrajenih v napravah za točenje goriva

Petrol filling stations - Construction and performance of automatic nozzles for use on fuel dispenser

Tankstellen - Anforderungen an Bau und Arbeitsweise von automatischen Zapfventilen für die Benutzung an Zapfsäulen

Stations service - Construction et performances des pistolets automatiques de remplissage utilisés sur les distributeurs de carburant

Ta slovenski standard je istoveten z: **EN 13012:2012**

ICS:

75.200	Oprema za skladiščenje nafte, naftnih proizvodov in zemeljskega plina	Petroleum products and natural gas handling equipment

SIST EN 13012:2012 **en,fr,de**

EUROPEAN STANDARD

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English Version

Petrol filling stations - Construction and performance of automatic nozzles for use on fuel dispensers

Stations-service - Construction et performances des pistolets automatiques de remplissage utilisés sur les distributeurs de carburant

Tankstellen - Anforderungen an Bau und Arbeitsweise von automatischen Zapfventilen für die Benutzung an Zapfsäulen

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

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Foreword

This document (EN 13012:2012) has been prepared by Technical Committee CEN/TC 393 “Equipment for tanks and filling stations”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by December 2012, and conflicting national standards shall be withdrawn at the latest by December 2012.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 13012:2001.

Compared with the EN 13012:2001 version, the following fundamental changes have been made:

a) a new note at the end of the scope was added: ‘Fuels other than of Explosion Group IIA are excluded from this European Standard’;

b) an informative Annex C concerning environmental aspects was added.

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.

For relationship with EU Directives, see informative Annex ZA, which is an integral part of this document.

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.

1 Scope

This European Standard specifies safety and environmental requirements for the construction and performance of nozzles to be fitted to metering pumps and dispensers installed at filling stations and which are used to dispense liquid fuels into the tanks of motor vehicles, boats and light aircraft and into portable containers, at flow rates up to 200 l min^{-1}.

The requirements apply to automatic nozzles dispensing flammable liquid fuels at ambient temperatures from –20 °C to +40 °C with the possibility for an extended temperature range.

This European Standard does not apply to equipment dispensing liquefied petroleum gas nor compressed natural gas.

This European Standard does not include any requirements for metering performance, such as may be specified under the Measuring Instruments Directive, nor those requirements specified under the Electromagnetic Compatibility Directive.

Vapour recovery efficiency rates are not considered within this European Standard.

NOTE 1 This European Standard does not apply to equipment for use with liquefied petroleum gas (LPG) or liquefied natural gas (LNG) or compressed natural gas (CNG).

NOTE 2 Fuels other than of Explosion Group IIA are excluded from this European Standard.

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 976–1:1997, *Underground tanks of glass-reinforced plastics (GRP) — Horizontal cylindrical tanks for the non-pressure storage of liquid petroleum based fuels — Part 1: Requirements and test methods for single wall tanks*

EN 1360, *Rubber and plastic hoses and hose assemblies for measured fuel dispensing systems — Specification*

EN 13463–1:2009, *Non-electrical equipment for potentially explosive atmospheres — Part 1: Basic method and requirements*

EN 13617–2, *Petrol filling stations — Part 2: Safety requirements for construction and performance of safe breaks for use on metering pumps and dispensers*

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

EN 60204–1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204–1:2005, modified)*

EN ISO 228–1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1)*

ISO 261, *ISO general purpose metric screw threads — General plan*

ISO 965–2, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose external and internal screw threads — Medium quality*

ISO 9158, *Road vehicles — Nozzle spouts for unleaded gasoline*

ISO 9159, *Road vehicles — Nozzle spouts for leaded gasoline and diesel fuel*

ISO 11925–3, *Reaction to fire tests — Ignitability of building products subjected to direct impingement of flame — Part 3: Multi-source test*

3 Terms and definitions

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

3.1
nozzle
automatic delivery nozzle which is a manually operated device that controls the flow of fuel during a dispensing operation and includes a spout and an automatic shut-off mechanism

3.2
vapour recovery nozzle
delivery nozzle that additionally includes a path through which vapour can be recovered

3.3
automatic shut-off
function that automatically stops the fluid flow to prevent overfilling

3.4
attitude device
means to prevent delivery unless the spout is pointing down

3.5
automatic de-activating mechanism
means to prevent flow if the system is re-energized while the operating lever is in an open position

3.6
operating device
mechanism by which the main valve is controlled by the user

3.7
main valve
device controlling the fluid flow

3.8
latch
mechanism to hold the operating lever in an open position

3.9
guard
structure to protect the operating lever

3.10
spout
device to guide the flow of fluid into a tank of a motor vehicle, boat and light aircraft or portable container

3.11
check valve
device to restrict the hose draining through the nozzle

3.12
flow rate
flow of fluid obtained under normal working conditions

Note 1 to entry: In l min^{-1} or m^3 h^{-1}.

3.13
line shock
peak pressure developed when fluid flow is stopped from full flow by the nozzle

3.14
spout axis angle
angle of the spout axis to horizontal above which no flow through the nozzle is allowed

3.15
maximum flow rate
upper limit of flow rate range, specified by the manufacturer

4 Construction

4.1 General

Materials used in the construction of nozzles shall be chemically and dimensionally stable under known service conditions. Materials likely to come into contact with fuels, both in liquid and vapour phases, shall be resistant to attack by these fuels. Conformity shall be demonstrated by manufacturers' declarations and by the tests detailed in Annex B.

The nozzle shall be explosion protected and shall be category 2 in accordance with EN 13463–1. Components fitted to the spout and within the vapour recovery path shall be category 1 in accordance with EN 13463–1. The nozzle shall fulfil the requirements for temperature class T3 and group IIA according to EN 60079-0 or EN 13463–1.

The nozzle shall have a manually controlled operating device, which may incorporate an integral latch, to control the liquid flow.

NOTE For safety reasons it might be necessary to operate without the latch.

The surfaces and mechanisms of the nozzle which, in normal operation, come into contact with the operator shall be such that they present no risk of injury. Conformity to this requirement is demonstrated by visual inspection of a nozzle.

Nozzles shall be classified as Type I or Type II according to the delivery characteristics given in Table 1.

Table 1 — Types of construction

Value	Type I	Type II
maximum flow rate	≤ 80 l · min^{-1}	> 80 l · min^{-1} ≤ 200 l · min^{-1}
dimension of the spout	According to ISO 9158 or ISO 9159	Not specified
position of the sensor	According to ISO 9158 or ISO 9159	≤ 50 mm from plane of spout tip
spout axis angle	0°	+ 2°

4.2 Guard

A guard shall be provided to prevent accidental misuse of the operating device.

4.3 Inlet threads

Inlet threads shall be of one of the following two styles.

a) Style 1 – for nozzles without a vapour recovery path.

For nozzles without a vapour recovery path, using parallel threads for the hose connection in accordance with EN ISO 228-1, the sealing surfaces of the internal and external threads shall be designed such that they are suitable for use with flat gaskets.

b) Style 2 – for nozzles with a vapour recovery path.

M 34 x 1,5 Female, in accordance with ISO 261 and ISO 965-2.

The total thread depth shall be not less than 15,0 mm. The inlet end shall be machined to a diameter of (35,0 ± 0,05) mm for a length (6,0 ± 0,1) mm.

Inlet thread dimensions shall be in accordance with Table 2.

Table 2 — Thread specification for style 1

Nominal inlet size	Female threads	Male threads
	Maximum thread depth [a] mm	Minimum thread length [b] mm
¾"	12,5	11,0
1"	15,5	14,0
1¼"	15,5	17,5
1½"	15,5	18,0

[a] The thread depth, measured from the outer fore-part to the metallic inner sealing face.

[b] The stated minimum length does only apply if the female thread of the hose fitting includes an inner flat gasket. In case of using an outer flat gasket, the male threads may be shorter as stated.

4.4 Safe break

Where a nozzle is provided with a safe break this shall fulfil the requirements according to EN 13617–2.

4.5 Latch

Where a latch is provided and in use, it should be capable of being normally disarmed by the user.

4.6 Automatic de-activating mechanism

If an automatic de-activating mechanism entirely in the nozzle exists, it shall fulfil the requirements according to Table 4.

5 Physical properties

The physical properties of the nozzle shall conform to the requirements given in Table 3 when tested by the methods indicated.

Table 3 — Physical properties of nozzle

Property	Test procedure	Requirement
Electrical resistance of any point on the spout to hose coupling	B.1	≤ 100 kΩ for each measurement
Electrostatic properties	–	EN 13463-1:2009, 6.7
Ignitability of composite materials on nozzle body Ignition source C Effect time 20 s Surface flame impingement	According to ISO 11925-3	The material tested shall not afterflame
Bending moment	Annex A	Clause 6
Fuel compatibility	Annex A	Clause 6
Characteristics of nozzle body and/or cover to prevent dangerous, mechanically generated sparks (resistance to sparking)	–	EN 13463-1:2009, 6.4.4.2

6 Functional requirements

The nozzle shall conform to the operational requirements given in Table 4 and Table 5 when tested according to the schedule given in Table 6.

Where a test liquid is required it shall be an odourless kerosene except where noted otherwise.

Table 4 — Operational requirements of nozzle (type tests)

Test	Test method	Requirement
Pressure test	B.2	No quantifiable leakage or permanent deformation visible to an eye with normal visual acuity.
Drop test	B.3	Functions which are relevant for safety shall not be impaired. The nozzle shall be closed after being dropped.
Tightness test	B.4	No quantifiable sign of leakage visible to an eye with normal visual acuity.
Automatic shut-off test 1	B.5	The flow of fluid shall be stopped within 1 s.
Drain test	B.6	The liquid measured shall be less than 10 ml.
Attitude device test 1	B.7	Product flow shall stop before spout axis reaches the spout axis angle specified for the relevant type in Table 1.
Attitude device test 2	B.8	The average volume of fluid passing nozzle valve(s) shall not exceed 0,2 % of the volume flowing in 1 min at maximum flow rate for certification.
Automatic de-activating mechanism test	B.9	There shall be no product flow until manually reset.
Line shock generated test	B.10	The pressure generated shall not remain above 1,6 MPa (16 bar) for more than 15 ms.

Table 5 — Operational requirements of nozzle (routine tests)

Test	Test method	Requirement
Automatic de-activating mechanism test	B.9	There shall be no product flow until manually reset.
Tightness test	B.11	No quantifiable sign of leakage visible to an eye with normal visual acuity.
Automatic shut-off test 2	B.12	The flow shall stop instantly.
Attitude device test 3	B.13	The product flow shall stop at an angle not more than 45° above the angle specified for the type as in Table 1.

7 Frequency of testing

Testing shall be performed in accordance with the schedule given in Table 6.

Type tests are those tests required to obtain certification.

A total of four nozzles shall be used for type tests as follows.

— One nozzle shall be pre-conditioned in accordance with A.2 and A.3 and shall then be subjected to a sequence of the tests specified in B.2 to B.8 and B.10. If an optional automatic de-activating mechanism is included, B.9 shall also apply.

— These tests shall begin not less than 30 min and be completed not more than 150 min after completion of the preconditioning procedures.

— Three nozzles shall be pre-conditioned in accordance with A.2 and shall then be subjected to a sequence of the tests specified in B.2 to B.8 and B.10. If an optional automatic de-activating mechanism is included, B.9 shall also apply.

— The type, as given in Table 1, and the maximum flow rate shall both be declared by the manufacturer.

Routine tests shall be carried out on each finished nozzle; B.9 shall only apply if the optional automatic de-activating mechanism is included.

Table 6 — Test plan

Property	Type tests	Routine tests
Electrical resistance	B.1	B.1 [a]
Ignitability	Manufacturers declaration	–
Resistance to sparking	Manufacturers declaration	–
Pressure test	B.2	–
Drop test	B.3	–
Tightness test	B.4	B.11
Automatic shut-off test	B.5	B.12
Drain test	B.6	–
Attitude device test	B.7 and B.8	B.13
Automatic de-activating mechanism test	B.9	B.9
Line shock generation test	B.10	–

[a] Where there is low resistance material from inlet thread to spout connection, this routine test shall not be required.