SLOVENSKI STANDARD
oSIST prEN 13616-1:2024

01-julij-2024

Naprave za preprečitev prepolnitve za nepremične rezervoarje za tekoča goriva - 1. del: Naprave za preprečitev prepolnitve z zaporno napravo

Overfill prevention devices for static tanks for liquid fuels - Part 1: Overfill prevention devices with closure device

Überfüllsicherungen für ortsfeste Tanks für flüssige Brenn- und Kraftstoffe - Teil 1: Überfüllsicherungen mit Schließeinrichtung

Dispositifs limiteurs de remplissage pour réservoirs statiques pour carburants liquides - Partie 1 : Dispositifs limiteurs de remplissage avec dispositif de fermeture

Ta slovenski standard je istoveten z: **prEN 13616-1**

ICS:

23.020.10	Nepremične posode in rezervoarji	Stationary containers and tanks
75.200	Oprema za skladiščenje nafte, naftnih proizvodov in zemeljskega plina	Petroleum products and natural gas handling equipment

oSIST prEN 13616-1:2024 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 13616-1

May 2024

ICS 23.020.10

Will supersede EN 13616-1:2016

English Version

Overfill prevention devices for static tanks for liquid fuels - Part 1: Overfill prevention devices with closure device

Dispositifs limiteurs de remplissage pour réservoirs statiques pour carburants liquides - Partie 1 : Dispositifs limiteurs de remplissage avec dispositif de fermeture

Überfüllsicherungen für ortsfeste Tanks für flüssige Brenn- und Kraftstoffe - Teil 1: Überfüllsicherungen mit Schließeinrichtung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 393.

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.

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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye 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

Ref. No. prEN 13616-1:2024 E

Contents

Page

European foreword

This document (prEN 13616-1:2024) has been prepared by Technical Committee CEN/TC 393 “Equipment for storage tanks and for service stations”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 13616-1:2016.

prEN 13616-1:2024 includes the following significant technical changes with respect to EN 13616-1:2016:

a) Clause 2: Normative references were updated;

b) 3.1: the term “initial closure level” was replaced by “initial closure level for two stages closure device only”;

c) 3.2: the term “final closure level” was replaced by “final closure level for single or two stages closure final device”;

d) 3.9: Definition was added;

e) 4.2.1 and 4.2.3: Tolerance of 5 % was added and the maximum flow velocities was reduced to 2,5 m/s;

f) 5.2: Chemical suitability test was updated;

g) 5.3: Temperature range for final closure simulation was deleted;

h) New subclause 5.5: Subclause relating to pressure surge test was removed from previous subclause on function test (5.6);

i) New Clause 6: Only FPC (Factory Production Control) aspects were kept according to previous Clause 6 “AVCP”;

j) Figure B.1: Key was updated;

k) Table C.1: Maximum flow rate values were updated;

l) Annex ZA “Construction products Regulation - CPR” was deleted due to the fact that revision is not candidate to the harmonization to CPR (but only to ATEX Directive).

An environmental check-list is indicated in the informative Annex D.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

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

1 Scope

This document contains requirements, test and assessment methods, marking, labelling and packaging applicable to overfill prevention devices with closure device. The devices are usually composed by:

— sensor;

— evaluation device;

— closure device.

Overfill prevention devices intended to be used in/with underground and/or above ground, non-pressurized, static tanks designed for liquid fuels.

NOTE Liquid fuel means liquids for internal combustion engines, heating/cooling boilers and generators.

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 228:2012+A1:2017, *Automotive fuels — Unleaded petrol — Requirements and test methods*

EN 590:2022, *Automotive fuels — Diesel — Requirements and test methods*

EN 1127-1:2019, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology*

EN 14214:2012+A2:2019, *Liquid petroleum products — Fatty acid methyl esters (FAME) for use in diesel engines and heating applications — Requirements and test methods*

CEN/TR 15993:2018, *Automotive fuels — Ethanol (E85) automotive fuel — Background to the parameters required and their respective limits and determination*

EN ISO 22854:2021, *Liquid petroleum products — Determination of hydrocarbon types and oxygenates in automotive-motor gasoline and in ethanol (E85) automotive fuel — Multidimensional gas chromatography method (ISO 22854:2021)*

EN 60079-14:2014,[1] *Explosive atmospheres — Part 14: Electrical installations design, selection and erection (IEC 60079-14:2013)*

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

3 Terms and definitions

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

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

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

— IEC Electropedia: available at https://www.electropedia.org/

[1] As impacted by EN 60079-14:2014/AC:2016.

3.1
overfill prevention device
device installed in a supply system, which automatically stops the delivery, preventing the liquid level in the tank exceeding a final closure level for single or two stages closure final device

3.2
initial closure level for two stages closure device only
lower level than final closure level at which the overfill prevention device stops the liquid flow and which level it can be reopened

3.3
final closure level for single or two stages closure final device
level at which the overfill prevention device prevents any further product, apart from a permissible leak rate, entering the storage tank

3.4
supply system
connection hoses, fittings, devices, pumps and any fixed pipework through which the liquid is delivered to the static tank from any tank vehicle

Note 1 to entry: The supply system includes both tank vehicle and stationary tank equipment.

3.5
tank vehicle
vehicle built to carry liquids in integral tanks comprising one or more compartments intended for discharge to static tanks

Note 1 to entry: The tank vehicle can integrate a pump.

3.6
operational leak rate
permitted flow rate of liquid allowed to pass through the overfill prevention device after final closure

3.7
operational pressure
pressure in the filling pipe which can be reached during the filling of the tank, excluding the pressure during the closure of the overfill prevention device

3.8
vapour tight overfill prevention device
device where no vapour can pass through from the ullage spaces in normal operation

3.9
non vapour tight overfill prevention device
device where vapour can pass through from the ullage spaces in normal operation

4 Requirements

4.1 General

The overfill prevention device shall be either vapour tight or non-vapour tight.

4.1.1 Vapour tight

The overfill prevention device shall not leak vapour between the tank vapour space to the filling pipe.

4.1.2 Non vapour tight

The overfill prevention device shall not present an overall vapour leak greater than the equivalent leak from a hole of Ø 3 ± 0,05 mm at a pressure (3,5 ± 0,5) kPa pressure.

4.2 Effectiveness

4.2.1 General

For pressure, flow velocity, flow rate and time the tolerances are ± 5 %.

4.2.2 Operational flow range and operational pressure range

4.2.2.1 Overfill prevention device for gravity filling only (see Table C.1)

The device shall work at flow velocities between 0,2 m/s and 2,5 m/s ± 5 %.

The device shall not re-open at a static pressure > (15 ± 5 %) kPa after closure.

The device shall withstand static pressure of at least (200 ± 5) % kPa after closure.

4.2.2.2 Overfill prevention device for gravity or pump filling (see Table C.1)

The device shall work at flow velocities between 0,2 m/s and 2,5 m/s ± 5 %.

The device shall not open at a static pressure > (15 ± 5 %) kPa after closure.

The device shall withstand a static pressure of at least (600 ± 5 %) kPa or (800 ± 5 %) kPa after closure according to manufacturer's declaration.

4.2.3 Pressure surge range

4.2.3.1 General

The operation of the overfill prevention device shall not generate pressure in excess of the design criteria of the supply system.

4.2.3.2 Overfill prevention device for gravity filling only

Any pressure surge created by the overfill prevention device at closure, exceeding (300 ± 5 %) kPa, shall not exceed a period of more than (10 ± 5 %) ms.

4.2.3.3 Overfill prevention device for gravity or pump filling

For pumps with a performance of (600 ± 5 %) kPa, any pressure surge created by the overfill prevention device at closure exceeding (900 ± 5) % kPa shall not exceed a period of more than (10 ± 5 %) ms.

For pumps with a performance of (800 ± 5 %) kPa any pressure surge created by the overfill prevention device at closure exceeding (1 200 ± 5 %) kPa shall not exceed a period of more than (10 ± 5 %) ms.

4.2.4 Closure level range

4.2.4.1 General

For both, single and two stage closure devices once the final closure level for single or two stages closure final device is reached, no further liquid other than the operational leak rate (see 4.2.5) shall enter the tank.

The final closure level for single or two stages closure final device shall be set so that after final closure of any device, the contents of the flexible delivery hose (and preferably the site delivery pipe) can be emptied into the tank.

4.2.4.2 Single stage closure device

On filling the tank to the final closure level for single or two stages closure final device, a complete and automatic closure of the flow, other than the operational leak rate (see 4.2.5), shall be effected.

4.2.4.3 Two stages closure device

On filling the tank to the initial closure level and the final closure level for single or two stages closure final device is reached, a complete and automatic closure of the flow, other than the operational leak rate (see 4.2.5), shall be achieved.

4.2.5 Operational leak rate

The device shall not have a leak flow rate greater than (300 ± 20) l/h after initial or final closure level for single or two stages closure final device at operational pressure.

4.3 Construction

4.3.1 Requirements for equipment for use in hazardous area according to Annex A.

4.3.2 All construction materials shall be compatible with and resist chemical attack by the liquid and its vapours, within the temperature range of −20 °C to +40 °C. The manufacturer shall specify all materials in contact with the liquid. Chemical suitability shall be tested in accordance with 5.2.

NOTE For equipment designed for operation in explosive atmospheres the normal ambient temperature range is −20 °C to +40 °C, unless otherwise specified and marked.

See Annex A and relevant standards indicated for complete information.

4.3.3 The overfill prevention device shall be of a durable construction. Durability shall be tested in accordance with 5.2, 5.6 and test rig according to Annex B.

4.3.4 All parts of the overfill prevention device situated either internally or externally on the tank shall withstand static negative pressure of $30\,^{0}_{-5}$ kPa and positive pressure of $100\,^{+10}_{0}$ kPa test to comply with 5.4.

4.4 Durability against wear from closure cycles

The device shall fulfil 4.2 after 1 500 cycles at the maximum flow (see Table C.1) and operational pressure given in 4.2.2.1 and 4.2.2.2 on the test rig according to Annex B.

5 Test methods

5.1 General

The manufacturer shall compile a list of all components and supply specifications to demonstrate that these components will not be affected in the design temperature range.

For all tests other than 5.2 and 5.4, the overfill prevention device shall be installed in accordance with the manufacturer's instructions in a test rig layout as shown in Annex B.

5.2 Chemical suitability test

The durability of all materials of the complete overfill prevention device normally exposed to liquids or their vapours, shall be tested against chemical attacks for the declared liquid with the test liquid of each relevant group according to EN 228:2012+A1:2017, EN 590:2022, EN 14214:2012+A2:2019, CEN/TR 15993:2018 and EN ISO 22854:2021.

Respectively three samples shall be immersed into each test liquid during 7 days and shall be exposed to their vapour 56 days at a temperature of (+20 ± 10) °C for the same one.

After this test the functionality of the overfill prevention device shall be checked according to 5.6.

5.3 Temperature range test

A fresh sample shall be used. The manufacturer shall compile a list of all components and supply specifications to demonstrate that these components will not be affected in the design temperature range. The different components shall be separately tested at the temperature of −20 °C and +40 °C.

A complete overfill prevention device shall be subjected to the temperatures; all mechanisms shall move, function freely and close by a manual test.

5.4 Component pressure tests

If any part of overfill prevention device is designed to be installed inside the tank or any other part of the system which may be pressurized, it shall be placed in a closed pressure vessel and subjected to an external pressure for (60 ± 5) min for each test. After the test, the device shall be working correctly, according to 5.6.

The equipment shall be subjected, in the vessel, to the following pressures:

— negative pressure: 30^{0}_{-5} kPa;

— pressure: 100^{+10}_{0} kPa.

Any resultant deformation shall not prevent and after the test, the device shall be working according to 5.6.

5.5 Pressure surge test

The maximum pressure surge generated at the pressure test point upon closure of the device shall be measured and shall not exceed the requirement in 4.2.3. This may be checked simultaneously with flow closure tests according to 5.6.2. The surge pressure shall be recorded at maximum flow rate in accordance with 4.2.2.1 and 4.2.2.2 using a pressure sensor located in the pipework within 200 mm above the device on the test rig specified in Annex B.

The pressure sensor and its measuring system shall have a response time of 1 ms.

Surge tests shall be carried out in accordance with Figure B.1. The bore size of the hose shall be equal to the overfill prevention device size.

5.6 Function tests

5.6.1 General

The overfill prevention device shall be mounted in accordance with manufacturer's instructions in a test rig layout shown in Figure B.1.

The test liquid for these tests can be water containing a corrosion preventing agent or an aliphatic petroleum distillate.

5.6.2 Final closure level for single or two stages closure final device test

5.6.2.1 The final closure level for single or two stages closure final device test shall be carried out on the test rig specified in the Annex B. According to 4.2.2, the overfill prevention device shall be tested by gravity and/or by pump delivery. This test shall be performed for single stage devices or the final closure of two stages devices.