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Bencinski servisi - 3. del: Varnostne zahteve za izdelavo in lastnosti varovalnih ventilov

Petrol filling stations - Part 3: Safety requirements for construction and performance of shear valves

Tankstellen - Teil 3: Sicherheitstechnische Anforderungen an Bau- und Arbeitsweise von Abscherventilen

Stations-service - Partie 3 : Exigences de sécurité relatives à la construction et aux performances des raccords de sécurité

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Petrol filling stations - Part 3: Safety requirements for construction and performance of shear valves

Stations-service - Partie 3 : Exigences de sécurité relatives à la construction et aux performances des raccords de sécurité

Tankstellen - Teil 3: Sicherheitstechnische Anforderungen an Bau- und Arbeitsweise von Abscherventilen

This European Standard was approved by CEN on 14 June 2021.

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

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European foreword

This document (EN 13617-3:2021) has been prepared by Technical Committee CEN/TC 393 “Equipment for storage tanks and for 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of an identical text or by endorsement, at the latest by March 2022, and conflicting national standards shall be withdrawn at the latest by March 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13617-3:2012.

In comparison with the 2012 edition, the following significant changes were made:

— shear valves for aqueous urea solution added;

— testing for vapour shear valves further differentiated from testing for fuel shear valves. Tests B.16, and B.17 are introduced;

— fire resistance test B.14 and B15 introduced and pass/fail criteria defined in Table 3;

— the liquid compatibility preconditioning fluid for shear valves is defined in EN 13617-1.

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 2014/34/EU.

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

EN 13617 consists of four parts:

— *Part 1: Safety requirements for construction and performance of metering pumps, dispensers and remote pumping units;*

— *Part 2: Safety requirements for construction and performance of safe breaks for use on metering pumps and dispensers;*

— *Part 3: Safety requirements for construction and performance of shear valves;*

— *Part 4: Safety requirements for construction and performance of swivels for use on metering pumps and dispensers.*

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document specifies safety and environmental requirements for the construction and performance of shear valves to be fitted to metering pumps, dispensers, and/or satellite delivery systems installed at petrol filling stations and used to dispense liquid fuels and aqueous urea solution into the tanks of motor vehicles, boats and light aircraft and into portable containers at flow rates up to 200 $l \cdot min^{-1}$.

This document applies to fuels and their vapours of subdivision Group IIA according to EN ISO/IEC 80079-20-1 and also aqueous urea solution according to ISO 22241-1.

The requirements apply to shear valves at ambient temperatures from −20 °C to +40 °C with the possibility for an extended temperature range.

This document pays particular attention to mechanical and hydraulic characteristics.

This document does not apply to equipment dispensing compressed or liquefied gases.

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

EN 13617-1:2021, *Petrol filling stations - Part 1: Safety requirements for construction and performance of metering pumps, dispensers and remote pumping units*

EN IEC 60079-0:2018, *Explosive atmospheres - Part 0: Equipment - General requirements (IEC 60079-0:2017)*

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

ISO 7-1:1994, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 11925-3:1997, *Reaction to fire tests — Ignitability of building products subjected to direct impingement of flame — Part 3: Multi-source test*

ISO 22241-1:2019, *Diesel engines — NOx reduction agent AUS 32 — Part 1: Quality requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13617-1:2021 and the following 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 https://www.electropedia.org/

3.1
shear valve
component whose function is to prevent continuous liquid flow or vapour release in the event of impact or fire

3.2
main valve
<liquid> normally open valve on the inlet side, closing when the shear valve operates

3.3
main valve
<vapour> normally open valve on the outlet side, closing when the shear valve operates

3.4
pressure relief valve
valve to allow liquid to return to the pipework below the dispenser if pressure in the dispenser increases beyond a defined level

3.5
separation zone
part of the shear valve designed to be the first section to fracture when stressed

3.6
mechanical link
device to activate the closing mechanism automatically to stop the flow of liquid when the shear valve breaks

3.7
thermal detector
device to activate the closing mechanism automatically to stop the flow of liquid when the temperature in the vicinity of the shear valve exceeds the operating temperature

3.8
test plug
device to allow pressure testing of associated pipework

3.9
mounting point
rigid attachment facility on the inlet and outlet sections of the shear valve

4 Explosion protection measures

4.1 Explosion protection measures shall be taken in accordance with EN 1127-1:2019 and EN 13617-1:2021, Annex B.

4.2 The shear valve shall be explosion protected and shall be Category 2G, Group II, EPL Gb in accordance with EN ISO 80079-36:2016. When a shear valve has a vapour path, the vapour path shall be Category 1G, Group II, EPL Ga in accordance with EN ISO 80079-36:2016. The shear valve shall fulfil the requirements for temperature Class T3 and Group IIA in accordance with EN IEC 60079-0:2018 or EN ISO 80079-36:2016.

5 Construction

5.1 General requirements

5.1.1 All electrical and non-electrical equipment and components, intended for use in potentially explosive atmospheres, shall be designed and constructed according to good engineering practice and in conformity with the required categories/EPLs for Group II equipment to ensure avoidance of any ignition source. To classify the category/EPL of the equipment it shall be subjected to an ignition hazard assessment in accordance with EN ISO 80079-36:2016, 5.2.

5.1.2 All materials used in the construction shall be chemically and dimensionally stable under known service conditions. Materials likely to come into contact with fuels in both liquid and vapour phases shall be resistant to attack by these fuels. Conformity shall be demonstrated by testing in accordance with Clause 8.

5.1.3 Light alloys when used shall conform to EN IEC 60079-0:2018, 8.3. If other specifications for explosion protected equipment impose more stringent requirements then the more stringent requirement shall apply.

5.1.4 All components shall be of corrosion resistant material or shall be provided with a corrosion resistant protective coating.

5.1.5 Outside surfaces likely to be handled shall be free of sharp edges.

5.2 Specific requirements

5.2.1 Means shall be provided to connect the shear valve to input and output pipework. The means selected shall not fail at forces less than the design shear force of the shear valve.

5.2.2 The shear valve shall be so designed that after fracture of the weak section, the input and output sections shall be completely decoupled.

5.2.3 The shear valve shall not have a means to prevent the main valve from closing completely when it is operated by the weak section or by the thermal detector.

5.2.4 The thermal detector shall be so constructed that when it operates the main valve closes.

5.2.5 Shear valves for liquids may include a manual means of closing the main valve (liquid) for maintenance purposes.

5.2.6 Test plugs, where fitted to shear valves in liquid containment systems, shall be on the inlet side of the main valve.

5.3 Classes of construction

Shear valves are classified in accordance with Table 1.

Table 1 — Classes of construction

Valve type	Class		
	I	II	III
Main valve	Yes	Yes	Yes
Thermal detector	Yes	Yes	No
Check valve	Yes	No	No
Pressure relief valve	Yes	No	No

Class I and II for liquid pressure systems, and Class III for vapour systems only.

5.4 Threads

Input and output threads shall be in accordance with ISO 7-1:1994.

6 Physical properties

The physical properties of the shear valve shall conform to Table 2 when tested by the methods indicated.

Table 2 — Physical properties of shear valve

Physical property	Requirement	Test method
Liquid compatibility (preconditioning)	Clause 5	B.5
Electrostatic properties	EN ISO 80079-36:2016, 6.7	EN ISO 80079-36:2016
Fire resistance	No catastrophic failure	B.14
Characteristics body and/or internal components to prevent dangerous, mechanically generated, sparks (resistance to sparking), including during separation of inlet and outlet sections	Metallic enclosure requirements of EN IEC 60079-0:2018, 8.3	—

7 Operational requirements

The shear valve shall conform to the operational requirements according to Table 3 and Table 4 when tested by the methods indicated.

Table 3 — Operational requirements

Item	Requirement	Test method
Housing of liquid shear valves	No quantifiable leakage, as evidenced by bubbles, or permanent deformation visible to an eye with normal visual acuity.	B.2
Housing of vapour shear valves	No quantifiable leakage, as evidenced by bubbles, or permanent deformation visible to an eye with normal visual acuity.	B.16
Main valve of liquid shear valves	No quantifiable leakage, as evidenced by bubbles, or permanent deformation visible to an eye with normal visual acuity.	B.3
Main valve of vapour shear valves	No quantifiable leakage, as evidenced by bubbles, or permanent deformation visible to an eye with normal visual acuity.	B.17
Pressure relief valve test	There shall be a continuous leak through the relief valve.	B.4
Housing	B.6.5 No catastrophic damage B.6.7 No leakage	B.6
Main valve	B.7.5 No catastrophic damage B.7.7 No leakage	B.7
Check valve (class I only)	No quantifiable leakage or permanent deformation visible to an eye with normal visual acuity.	B.8
Pressure relief valve (class I only)	There shall be a continuous leak through the relief valve.	B.9
Thermal link 1 (class I and class II only)	Main valve shall remain open.	B.10
Thermal link 2 (class I and class II only)	Main valve shall be closed.	B.11
Main valve closure (Shear valve for liquids)	Main valve shall be closed. There shall be no continuous leakage past main valve. Weak section shall have permitted separation of the inlet and outlet sections at a bending moment of ≤ 880 Nm.	B.12
Main valve closure (Shear valve for vapour recovery)	Main valve shall be closed. There shall be no continuous leakage past main valve. Weak section shall have permitted separation of the inlet and outlet sections at a bending moment of ≤ 880 Nm.	B.13
Fire resistance	B.14.3 and B.15.3 No catastrophic failure a of the shear valve body. Main valve shall remain closed. The shear valve assembly shall not support sustained ignition, create flaming debris, cause “after flaming” or “progressive smouldering”. B.14.4 and B.15.4 The volume of liquid which leaks through the shear valve assembly shall be < 500 ml.	B.14 and B.15
NOTE Catastrophic failure of the shear valve body following the fire resistance test can be determined by replacing the internal components of the complete, non-separated, shear valve assembly and then performing test B.6, with a result of B.6.7: No leakage.		