BS EN 13617-2:2012

BSI Standards Publication

Petrol filling stations

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

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National foreword

This British Standard is the UK implementation of EN 13617-2:2012. It supersedes BS EN 13617-2:2004, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PVE/393/4, Metering pumps and dispensers for liquid fuel.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Tankstellen - Teil 2: Sicherheitstechnische Anforderungen an Bau- und Arbeitsweise von Abreißkupplungen für Zapfsäulen und druckversorgte Zapfsäulen

This European Standard was approved by CEN on 28 January 2012.

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Foreword

This document (EN 13617-2:2012) 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of an identical text or by endorsement, at the latest by September 2012, and conflicting national standards shall be withdrawn at the latest by September 2012.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 13617-2:2004.

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(s).

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

According to edition EN 13617-2:2004 the following fundamental changes are given:

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

— informative Annex C concerning environmental aspects added.

The present standard is composed of the following 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*.

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 requirements for the construction and performance of safe breaks to be fitted to metering pumps and dispensers installed at filling stations and 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 safe breaks at ambient temperatures from –20 °C to +40 °C with the possibility for an extended temperature range.

It pays particular attention to electrical, mechanical and hydraulic characteristics of, and electrical apparatus incorporated within or mounted on, the safe break.

This European Standard applies mainly to hazards related to the ignition of liquid fuels being dispensed or their vapour. This European Standard also addresses electrical and mechanical hazards.

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 228, *Automotive fuels — Unleaded petrol — Requirements and test methods*

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

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

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

EN 13483, *Rubber and plastic hoses and hose assemblies with internal vapour recovery for measured fuel dispensing systems — Specification*

prEN 13617-1:2010, *Petrol filling stations — Part 1: Safety requirements for the construction and performance of metering pumps, dispensers and remote pumping units*

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

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)*

EN ISO 1825, *Rubber hoses and hose assemblies for aircraft ground fuelling and defuelling — Specification (ISO 1825)*

EN ISO 8031:2009, *Rubber and plastics hoses and hose assemblies — Determination of electrical resistance and conductivity (ISO 8031:2009)*

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 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 terms and definitions given in prEN 13617-1:2010 and the following apply.

3.1
safe break
device to minimize fuel spillage and to stop fuel flow achieved by separation between nozzle and metering pump or dispenser within a defined range of forces

3.2
safe break type 1
safe break constructed for liquid lines only

3.3
safe break type 2
safe break constructed for liquid lines combined with vapour recovery lines

3.4
nozzle break
safe break fitted directly into the nozzle inlet, or integral with the nozzle

3.5
hose break
safe break fitted within the delivery hose circuit

3.6
pump break
safe break fitted directly to the fixed hydraulics

3.7
re-usable safe break
safe break that, once operated, may be re-assembled for further use

3.8
non re-usable safe break
safe break that, once operated, cannot be re-assembled for further use

4 Explosion protection measures

4.1 Explosion protection measures shall be taken in accordance with EN 1127–1 and Annex B of prEN 13617-1:2010.

4.2 The safe break shall be explosion protected and shall be Category 2 in accordance with EN 13463–1. The vapour path of a vapour recovery safe break shall be Category 1 in accordance with EN 13463–1. The safe break shall fulfil the requirements for temperature class T3 and Group IIA to EN 60079-0 or EN 13463–1.

5 Construction

5.1 General

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 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 5.2 of EN 13463-1:2009.

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. Compliance shall be demonstrated by manufacturer's declaration and compliance with the tests B.1 to B.16 inclusive.

5.1.3 Light alloys when used shall conform to the requirements of 6.4.4.2 of EN 13463–1:2009. If other specifications for explosion protected equipment impose more stringent requirements then the more stringent requirement shall apply.

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

5.1.5 If protective covers are fitted they shall be constructed such that they allow ventilation and evaporation of fuel even if some shrinkage occurs. They shall not affect the performance of the safe break.

5.1.6 Safe breaks Type 1 and Type 2, except nozzle breaks, when operated shall close liquid lines both up stream and down stream of the break.

5.1.7 For safe breaks Type 2 it is not required to close vapour lines either side of the break. A means to close off vapour lines may be included.

5.1.8 On re-usable safe breaks, the sections that break away shall be constructed so that the means of reconnection cannot be damaged by impacts suffered as a result of separation.

5.1.9 The construction shall be such that on reconnection of a re-usable device, or attempted reconnection of a non re-usable device, fluid shall not be sprayed out during the reconnection action.

5.2 Hose breaks

Hose breaks which incorporate hose shall use hose conforming to EN 1360, EN ISO 1825 or EN 13483.

5.3 Inlet threads

5.3.1 Safe break type 1

Form 1 threads for the hose connection shall be parallel threads according to EN ISO 228–1 according to Table 1. The sealing surfaces of the internal and external threads shall be designed such that they are suitable for use with an appropriate seal.

Table 1 — Form 1 Thread specifications

Nominal inlet size inch	**FEMALE THREADS**[a]	**MALE THREADS**[b]
	Maximum thread depth mm	Minimum thread length mm
¾”	12,5	11,0
1”	15,5	14,0
1 1/4”	15,5	17,5
1 1/2”	15,5	18,0

[a] The thread depth is measured from the outer to the metallic inner sealing face.

[b] The stated minimum lengths 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.

5.3.2 Safe break type 2

Threads shall comply with Form 2:

— Form 2.

— M 34 × 1,5 female or male according to ISO 261 and ISO 965–2.

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

6 Physical properties

The physical properties of the safe break shall be according to Table 2.

Table 2 — Physical properties of safe break

PROPERTY	REQUIREMENT	TEST METHOD
Electrical resistance of inlet thread to outlet thread when fully assembled.	All readings to be < 10^5 Ω	B.16
Electrostatic properties	6.7 of EN 13463-1:2009	EN 13463-1
Fuel compatibility	Clause 7	B.2
Ignitability of composites on safe break, Ignition source C; Effect time 20 s; Surface flame impingement	The material tested shall not afterflame	ISO 11925–3
Characteristics of safe break body and/or cover to prevent dangerous, mechanically generated, sparks (resistance to sparking).	6.4.4.2 of EN 13463-1:2009	EN 13463-1

7 Operational requirements

The safe break shall comply with the operational requirements of Table 3 when tested by the indicated methods; and with a frequency of tests as specified in Clause 8.

Table 3 — Operational requirements

OPERATIONAL REQUIREMENT	REQUIREMENT	TEST METHOD
Tightness test 1	No quantifiable sign of leakage visible to an eye with normal visual acuity.	A.2
Pressure separation test 1	There shall be no separation of the safe break and no continuous flow of liquid	A.3
Pre-conditioning mechanical impact test	There shall be no increase in the volume of fuel released from the input section. There shall not be sufficient mechanical damage to prevent the re-assembly of the safe break when applying maximum re-assembly forces specified by the manufacturer.	B.3
Tightness test 2	No quantifiable sign of leakage visible to an eye with normal visual acuity.	B.4
Pressure separation test 2	There shall be no separation of the safe break and no continuous release of liquid	B.5
Pressure test	There shall be no catastrophic damage	B.6
Axial separation force test 1	Separation shall occur for an applied force F such that 800 N ≤ F ≤ 1500 N	B.7
Axial separation force test 2	Separation shall occur for an applied force F such that 800 N ≤ F ≤ 1500 N	B.8
Non-axial separation force test 1	Separation shall occur for an applied force F such that 800 N ≤ F ≤ 1500 N	B.9
Non-axial separation force test 2	Separation shall occur for an applied force F such that 800 N ≤ F ≤ 1500 N	B.10
Axial separation force test 3	Separation shall occur for an applied force F such that 800 N ≤ F ≤ 1500 N	B.11
Axial separation force test 4	Separation shall occur for an applied force F such that 800 N ≤ F ≤ 1500 N	B.12
Liquid release test	Liquid release ≤ 10 ml (for maximum flow rate ≤ 80 $l \cdot min^{-1}$), Liquid release ≤ 25 ml (for maximum flow rate > 80 $l \cdot min^{-1}$; ≤ 200 $l \cdot min^{-1}$), For nozzle breaks, liquid release ≤ 120 ml for the nozzle itself	B.13
Re-connection test 1	Liquid release ≤ 120 ml	B.14
Re-connection test 2	Liquid release ≤ 120 ml	B.15
Electrical resistance of inlet thread to outlet thread when fully assembled.	All readings to be < 10^5 Ω	B.16

8 Overview of tests

Tests shall be performed in accordance with Table 4.

NOTE Pneumatic testing is potentially a much more dangerous operation than hydraulic testing, in that, irrespective of size, any failure during test is likely to be of a highly explosive nature.

Type tests are those tests required to evaluate conformity. Each of four safe breaks shall be subjected to the type tests as set out below.

All safe breaks for type test shall be pre-conditioned according to B.2 and B.3.

The preconditioning mechanical impact test according to B.3 shall be done immediately after removal from saturated atmosphere and shall be commenced within 30 min of removal from saturated atmosphere. Tests B.4, B.5, B.7 to B.16 shall then be performed and shall be completed within 2 h of the commencement of the pressure test and finally in accordance with B.6.

Production acceptance tests shall be carried out on the first unit produced on a production run, the last unit manufactured on a production run and at least every one hundredth unit during the production run.

Routine tests shall be carried out on each finished safe break.

Table 4 — Tests

PROPERTY/REQUIREMENT	TYPE TESTS	PRODUCTION ACCEPTANCE TESTS	ROUTINE TESTS
Physical property	–		
Electrostatic properties	Declaration	Declaration	Declaration
Resistance to sparking	Manufacturers declaration according Table 2		
Operational requirement	–		
Pre-conditioning mechanical impact test	B.3	–	–
Tightness test 1	–	–	A.2
Tightness test 2	B.4	B.4	–
Pressure separation test 1	–	–	A.3
Pressure separation test 2	B.5	B.5	–
Pressure test	B.6	–	–
Axial separation force test 1	B.7	B.7	–
Axial separation force test 2	B.8	–	–
Non-axial separation force test 1	B.9	B.9	–
Non-axial separation force test 2	B.10	–	–
Axial separation force test 3	B.11	B.11	–
Axial separation force test 4	B.12	-	–
Liquid release test	B.13	B.13	–
Re-connection test 1	B.14	B.14	–
Re-connection test 2	B.15	–	–
Electrical resistance	B.16	B.16	B.16[a]

[a] Where there is low resistance material from inlet thread, across the break to the output then this routine test shall not be required.

9 Information for use

9.1 General

Information for use shall be according to prEN 13617-1.

9.2 Marking and instruction

If the size of the safe breaks is not large enough for the marking, only the name of the manufacturer and the type of the safe break shall be marked. All further details of the marking may be included in the declaration form.

Safe breaks shall be marked legibly and indelibly during the manufacturing process; where necessary this marking may be made visible for inspection by the easy removal of plastic covers. Marking shall include at least the following information:

— manufacturer's name or identification;

— EN-number;

— the ambient temperature range if it is outside the temperature range of -20 °C to +40 °C;

— type – as defined by this document;

— manufacturer’s type indication;

— serial number, batch code or date code with a precision of at least year and quarter;

— direction of flow.

In case of extended temperature range this shall be visibly marked.

Instructions shall be included for re-usable safe breaks, and concerning the maximum flow rate.

Instructions shall be provided by the manufacturer for the safe installation, operation and maintenance of the safe break.

Annex A
(normative)

General requirements of test

A.1 General

All pressures are gauge (over pressure) readings.

All tests shall be carried out at (20 ± 5) °C unless otherwise noted.

A.2 Tightness test 1

A.2.1 To confirm that the safe break does not leak.

A.2.2 The fully assembled safe break shall be tested with a pressure of $(525\,^{+10}_{0})$ kPa [$(5{,}25\,^{+0{,}1}_{0})$ bar], the pressure shall be maintained for not less than $(10\,^{+1}_{0})$ s.

A.2.3 During the $(10\,^{+1}_{0})$ s of the applied pressure observe for leakage and record results.

A.2.4 The pressure shall be reduced to 0 Pa [0 bar].

A.2.5 Alternatively to this test, for instance a pressure differential test, may be applied provided the results are comparable to those achieved by this test.

A.3 Pressure separation test 1

A.3.1 To confirm that the safe break does not separate under a stated applied pressure.

A.3.2 The fully assembled safe break shall be tested with a pressure of $(525\,^{+10}_{0})$ kPa [$(5{,}25\,^{+0{,}1}_{0})$ bar], the pressure shall be maintained for not less than $(10\,^{+1}_{0})$ s.

A.3.3 Observe and record the state of the safe break.

A.3.4 Alternatively to this test, for instance the application of an external pulling force identical to the internal force created by a liquid pressure of $(525\,^{+10}_{0})$ kPa ([$5{,}25\,^{+0{,}1}_{0}$) bar], may be applied provided the results are comparable to those achieved by this test.

Annex B
(normative)

Tests

B.1 Test liquid

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

B.2 Fuel compatibility pre-conditioning

B.2.1 To precondition materials used in the construction of the safe break in a defined manner.

B.2.2 The preconditioning test liquid shall be unleaded petrol according to EN 228.

B.2.3 The safe break shall be completely filled with the test liquid and maintained in that state for not less than 168 h.

B.2.4 The safe break shall now be drained of the test liquid and within 1 h of draining shall be placed in a closed vessel containing a saturated atmosphere of the test liquid.

B.2.5 At a time $(24\,^{+2}_{0})$ h from being placed in the saturated atmosphere the safe break shall be removed.

B.3 Pre-conditioning mechanical impact test of re-usable safe breaks

B.3.1 To pre-condition a re-usable safe break by simulating the impacts that may occur in use.

B.3.2 After separation of the re-usable safe break the coupling section with hose connection shall be fitted to a 3 m length of hose according to EN 1360, EN ISO 1825 or EN 13483.

B.3.3 The hose shall then be pressurised to (350 ± 10) kPa [(3,5 ± 0,1) bar]. Measure the value released during a $(10\,^{+0,5}_{0})$ min period.

B.3.4 Each of the inlet and outlet sections shall be released from a height h and shall be allowed to fall onto a concrete surface.

The height h shall be as follows:

Hose break h = 2,5 m

Nozzle break h = 1,0 m

Pump break h = 2,5 m.

B.3.5 Repeat the release onto the concrete surface 4 times.

B.3.6 Measure the volume released during a $(10\,^{+0,5}_{0})$ min period and observe for damage to the re-connection systems, results shall be recorded.

B.4 Tightness test 2

B.4.1 To confirm that the safe break does not leak.

B.4.2 The fully assembled safe break shall be tested with test liquid at a pressure of $(525\,^{+10}_{0})$ kPa [$(5{,}25\,^{+0{,}1}_{0})$ bar], the pressure shall be maintained for $(60\,^{+5}_{0})$ s.

B.4.3 During the $(60\,^{+5}_{0})$ s of the applied pressure observe for test liquid release and record results.

B.4.4 The pressure shall be reduced to 0 Pa [0 bar].

B.4.5 Repeat steps B.4.2, B.4.3 and B.4.4 above, four times.

B.5 Pressure separation test 2

B.5.1 To confirm that the safe break does not separate under a stated applied pressure.

B.5.2 The fully assembled safe break is tested with test liquid at a pressure of $(1{,}60\,^{+0{,}01}_{0})$ MPa [$(16{,}0\,^{+0{,}1}_{0})$ bar], the pressure shall be maintained for $(60\,^{+5}_{0})$ s.

B.5.3 The state of the safe break shall be observed and recorded.

B.6 Pressure test

B.6.1 To confirm that the closed valve on the input side of a separated safe break can withstand a stated applied pressure.

B.6.2 Apply a pressurized test liquid of $(1{,}40\,^{+0{,}01}_{0})$ MPa [$(14{,}0\,^{+0{,}1}_{0})$ bar] to the input side of an operated safe break; maintain the pressure for $(60\,^{+5}_{0})$ s.

B.6.3 The release of test liquid shall be observed and results shall be recorded.

B.7 Axial separation force test 1

B.7.1 To confirm that the safe break operates at a force within specified limits at maximum working pressure.

B.7.2 The safe break, internally pressurized with test liquid at a pressure of (350 ± 10) kPa [(3,5 ± 0,1) bar], shall be mounted in a test rig. An axial force applying tension across the safe break mechanism shall be applied from zero and increased at a rate of (200 ± 40) N s^{-1}.

B.7.3 The force at which the safe break operates shall be recorded.

B.7.4 For re-usable safe breaks conduct this test 10 times.

B.8 Axial separation force test 2 to nozzle breaks and pump breaks

B.8.1 To confirm that the safe break operates at a force within specified limits when the applied force is axial, at maximum working pressure.

B.8.2 The safe break, internally pressurized with test liquid at a pressure of (350 ± 10) kPa [(3,5 ± 0,1) bar], shall be mounted in a test rig. An axial force applying tension across the safe break mechanism shall be applied from zero and increased at a rate of (2000 ± 400) N·s^{-1}.

B.8.3 The force at which the safe break operates shall be recorded.

B.8.4 For re-usable safe breaks, conduct this test 10 times.

B.9 Non-axial separation force test 1 to nozzle breaks and pump breaks

B.9.1 To confirm that the safe break operates at a force within specified limits when the applied force is non-axial, at maximum working pressure.

B.9.2 The safe break, internally pressurized with test liquid at a pressure of (350 ± 10) kPa [(3,5 ± 0,1) bar], shall be mounted in a test rig. A non-axial force applying tension across the safe break mechanism, at an angle of $(30\,^{+5}_{0})$ degrees to the longitudinal axis, shall be applied from zero and increased at a rate of (200 ± 40) N s^{-1}.

B.9.3 The force at which the safe break operates shall be recorded.

B.10 Non-axial separation force test 2 to nozzle breaks and pump breaks

B.10.1 To confirm that the safe break operates at a force within specified limits when the applied force is non-axial, at maximum working pressure.

B.10.2 The safe break, internally pressurized with test liquid at a pressure of (350 ± 10) kPa [(3,5 ± 0,1) bar], shall be mounted in a test rig. A non-axial force applying tension across the safe break mechanism, at an angle of $(30\,^{+5}_{0})$ degrees to the longitudinal axis, shall be applied from zero and increased at a rate of (2000 ± 400) N s^{-1}.

B.10.3 The force at which the safe break operates shall be recorded.

B.11 Axial separation force test 3

B.11.1 To confirm that the safe break operates at a force within specified limits at nominal, rest, pressure.

B.11.2 The safe break, internally pressurized with test liquid at a pressure of (30 ± 10) kPa [(0,3 ± 0,1) bar], shall be mounted in a test rig. An axial force applying tension across the safe break mechanism shall be applied from zero and increased at a rate of (200 ± 40) N·s^{-1}.

B.11.3 The force at which the safe break operates shall be recorded.

B.12 Axial separation force test 4

B.12.1 To confirm that the safe break operates at a force within specified limits at nominal, rest, pressure.

B.12.2 The safe break, internally pressurized with test liquid at a pressure of (30 ± 10) kPa [(0,3 ± 0,1) bar], shall be mounted in a test rig. An axial force applying tension across the safe break mechanism shall be applied from zero and increased at a rate of (2000 ± 400) N s^{-1}.

B.12.3 The force at which the safe break operates shall be recorded.

B.13 Liquid release test

B.13.1 To confirm that the liquid released when the safe break operates is limited. For a nozzle break without a fuel line valve downstream of the break the volume released by the nozzle including the break coupling half connected to the nozzle shall be separately determined and subtracted from the total release to give the release due to the nozzle break.

B.13.2 The safe break is pressurised with test liquid at a pressure of (350 ± 10) kPa [(3,5 ± 0,1) bar].

B.13.3 The safe break is then caused to operate by the application of an axial force rising from zero at a rate of (200 ± 40) N s^{-1}.

B.13.4 Collect liquid released from both sections of the safe break.

B.13.5 The volume of the liquid released shall be measured and recorded.

B.14 Re-connection test 1

B.14.1 To confirm that the liquid released is limited when an operated safe break is re-connected or an attempt is made at re-connection at maximum working pressure.

B.14.2 For a nozzle break, drain the nozzle before proceeding to step B.14.3

B.14.3 The upstream section of an operated safe break shall be pressurised with test liquid at a pressure of (350 ± 10) kPa [(3,5 ± 0,1) bar].

B.14.4 The two sections of the operated safe break shall be manually brought together in an attempt to re-connect them.

B.14.5 Observe what occurs during attempt at re-connection, any liquid released shall be measured and results shall be recorded.

B.15 Re-connection test 2

B.15.1 To confirm that the liquid released is limited when an operated safe break is re-connected or an attempt is made at re-connection at nominal, rest, pressure.

B.15.2 For a nozzle break drain the nozzle before proceeding to step B.15.3

B.15.3 The upstream section of an operated safe break shall be pressurised with test liquid at a pressure of (30 ± 10) kPa [(0,3 ± 0,1) bar].

B.15.4 The two sections of the operated safe break shall be manually brought together in an attempt to re-connect them.

B.15.5 Observe what occurs during attempt at re-connection, any liquid released shall be measured and results shall be recorded.

B.16 Electrical resistance test

B.16.1 To determine the electrical resistance through the body of the assembled safe break.

B.16.2 The resistance shall be measured from the input to the output thread according to Clause 4 of EN ISO 8031:2009

B.16.3 The resistance in Ω shall be measured and recorded.

Annex C
(informative)

Environmental aspects

C.1 Materials should be selected to optimize product durability and lifetime and consideration should be made to avoiding the selection of rare or hazardous materials.

C.2 Consideration should be made to using recycled or re-used materials, and to the selection of materials which can then be subsequently recycled.

C.3 The possibility of marking components to aid to their sorting for disposal/recycling at end of life should also be reviewed.

C.4 Packaging design should consider using recycled materials, and materials that need little energy for their manufacture, and should minimize waste.

C.5 Packaging design should consider subsequent re-use and recycling.

C.6 The size and weight of packaging should be minimized whilst protecting the products to minimize waste through damage.

C.7 Test fluids should be used and disposed of in accordance with manufacturer’s instructions.

Environmental checklist

Environmental Issue	Stages of the life cycle										All stages
	Acquisition		Production		Use			End-of-Life			
	Raw materials and energy	Pre-manu-factured materials & components	Production	Packaging	Use	Maintenance and repair	Use of additional products	Reuse/ Material and Energy Recovery	Incineration without energy recovery	Final disposal	Transportation
Inputs											
Materials	C.1,C.2	C.1,C.2		C.5				C.2,C.3 C.5	C.2,C.3 C.5	C.2,C.3 C.5	
Water											
Energy				C.4							C.6
Land											
Outputs											
Emissions to air			C.7								
Discharges to water											
Discharges to soil											
Waste			C.7							C.2,C.3 C.5,C.6	
Noise, vibration, radiation, heat											
Other relevant aspects											
Risk to the environ-ment from accidents or unintended use											
Customer information											
Comments:											

NOTE 1 The stage of packaging refers to the primary packaging of the manufactured product. Secondary or tertiary packaging for transportation, occurring at some or all stages of the life cycle, is included in the stage of transportation.

NOTE 2 Transportation can be dealt with as being a part of all stages (see checklist) or as separate sub-stage. To accommodate specific issues relating to product transportation and packaging, new columns can be included and/or comments can be added.

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 94/9/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 94/9/EC.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative Clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1 – Correspondence between this European Standard and Directive 94/9/EC

Essential Requirements of Directive 94/9/EC	Qualifying remarks/Notes	Relevant clause(s) in this European Standard
1.0.1	Principles of integrated explosion safety	Whole standard
1.0.2	Design for misuse	5,6
1.0.5	Marking	9
1.1.1	Selection of materials – operational stresses	5.1.1, 5.1.3,
1.1.2	Selection of materials - reactivity	5.1.2
1.1.3	Selection of materials - compatibility	5.1.2, 5.1.3
1.2.2	Intended purpose is as a component of a dispenser according to prEN 13617-1	Whole standard
1.2.3	Enclosed structures and prevention of leaks	A.2, A.3, B.4, B.5
1.2.7 (a)	Avoidance of physical injury or other harm	5.1.1
1.2.7 (c)	Eliminate non-electrical dangers	5.1
1.2.7 (d)	Overloads	B.4
1.3.1	Hazards arising from different ignition sources	5.1, A.2
1.3.2	Hazards arising from static electricity	6
1.6.4	Hazards arising from connections	5,6, A.3, B.5, B.14, B.15
2.1.1.1	Source of ignition is not active under rare incidents	5.1.1

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

Bibliography

EN 13012, *Petrol filling stations — Construction and performance of automatic nozzles for use on fuel dispensers*

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