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

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

Stations-service - Partie 2: Exigences de sécurité relatives a la construction et aux performances des raccords cassants utilisés pour les distributeurs de carburant

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This European Standard was approved by CEN on 24 June 2004.

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Foreword

This document (EN 13617-2:2004) has been prepared by Technical Committee CEN/TC 221 “Shop fabricated metallic tanks and equipment for storage tanks and for service 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of an identical text or by endorsement, at the latest by March 2005, and conflicting national standards shall be withdrawn at the latest by March 2005.

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 the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This document 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 $l \cdot min^{-1}$.

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

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

NOTE Liquefied petroleum gas (LPG) is not a liquid in the sense of this document.

2 Normative references

The following referenced documents are indispensable for the application 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, *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 hoses and hose assemblies for measured fuel dispensing — Specification*

EN 13463–1:2001, *Non-electrical equipment for potentially explosive atmospheres — Part 1:Basic method and requirements*

prEN 13483, *Hoses and hose assemblies with internal vapour recovery for measured fuel dispensing systems — Specification*

EN 13617–1:2004, *Petrol filling stations - Part 1:Safety requirements for the construction and performance of metering pumps, dispensers and remote pumping units*

EN 50014:1997, *Electrical apparatus for potentially explosive atmospheres — General requirements*

EN 60079-0:, *Electrical apparatus for explosive gas atmospheres - Part 0: General requirement*

EN ISO 228–1, *Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

EN ISO 8031:1997, *Rubber and plastics hoses and hose assemblies — Determination of electrical resistance (ISO 8031:1993)*

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 EN 13617-1:2004 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 EN 13617-1:2004.

4.2 Equipment, component and protective systems used within hazardous areas, shall be suitable as a minimum requirement for Explosion Group IIA with temperature class T3 as defined in EN 60079-0 and 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 13463-1:2001.

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 manufacturers' 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 Clause 8 of EN 13463–1:2001. 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.

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.

5.1.7 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.

5.1.8 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 or prEN 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	7.4 of EN 13463-1:2001, 7.3.2 of EN 50014:1997	EN 13463-1 EN 50014
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).	8.2 of EN 13463-1:2001; 8.1 of EN 50014:1997 or equivalent measures (Manufacturer's declaration).	EN 13463-1 EN 50014