



NSAI
Standards

Irish Standard
I.S. EN 13616:2004

Overfill prevention devices for static tanks for liquid petroleum fuels

I.S. EN 13616:2004

Incorporating amendments/corrigenda/National Annexes issued since publication:
EN 13616:2004/AC:2006

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

<i>This document replaces:</i>	<i>This document is based on:</i> EN 13616:2004	<i>Published:</i> 7 July, 2004
This document was published under the authority of the NSAI and comes into effect on: 18 August, 2004		ICS number: 23.020.10 75.200
NSAI 1 Swift Square, Northwood, Santry Dublin 9	T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie W NSAI.ie	Sales: T +353 1 857 6730 F +353 1 857 6729 W standards.ie
Údarás um Chaighdeáin Náisiúnta na hÉireann		

I.S. EN 13616:2004

EUROPEAN STANDARD

EN 13616:2004/AC

NORME EUROPÉENNE

January 2006

EUROPÄISCHE NORM

Janvier 2006

Januar 2006

ICS 23.020.10; 75.200

English version
Version Française
Deutsche Fassung

Overfill prevention devices for static tanks for liquid petroleum fuels

Dispositifs limiteurs de remplissage pour
réservoirs statiques pour carburants
pétroliers liquides

Überfüllsicherungen für ortsfeste Tanks für
flüssige Brenn- und Kraftstoffe

This corrigendum becomes effective on 25 January 2006 for incorporation in the three official language versions of the EN.

Ce corrigendum prendra effet le 25 janvier 2006 pour incorporation dans les trois versions linguistiques officielles de la EN.

Die Berichtigung tritt am 25. Januar 2006 zur Einarbeitung in die drei offiziellen Sprachfassungen der EN in Kraft.



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

© 2006 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.
Tous droits d'exploitation sous quelque forme et de quelque manière que ce soit réservés dans le monde entier aux membres nationaux du CEN.
Alle Rechte der Verwertung, gleich in welcher Form und in welchem Verfahren, sind weltweit den nationalen Mitgliedern von CEN vorbehalten.

Ref. No.: EN 13616:2004/AC:2006 D/E/F

I.S. EN 13616:2004**EN 13616:2004/AC:2006 (E/F/D)****English version**

The Annex ZA has to be modified as follows:

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 Communities 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 — Comparison between Directive 94/9/EC and this European Standard

ESSENTIAL REQUIREMENTS OF DIRECTIVE 94/9/EC - EQUIPMENT AND PROTECTIVE SYSTEMS INTENDED FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES - ANNEX II					
CLAUSE	DESCRIPTION (PARAPHRASED)	APPLICABLE (YES/NO?)		HARMONISED CLAUSES OF THIS STANDARD	
		Type A	Type B	Type A	Type B
1	COMMON REQUIREMENT				
1.0	General requirements	YES	YES		
1.0.1	Principles of integrated explosion safety	YES	YES	Error! Reference source not found.	Error! Reference source not found.
-	prevent formation of explosive atmospheres	YES	NO	4.2.5	
-	prevent ignition of explosive atmospheres	YES	YES	Error! Reference source not found.	Error! Reference source not found.
-	limit range of explosion flames and pressures	YES	NO	4.2.5	
1.0.2	Design after due analysis of possible operating faults	YES	YES	4.1; Error! Reference source not found.	4.1; Error! Reference source not found.
1.0.3	Special checking & maintenance conditions	NO	NO		

I.S. EN 13616:2004

EN 13616:2004/AC:2006 (E/F/D)

CLAUSE	DESCRIPTION (PARAPHRASED)	APPLICABLE (YES/NO?)		HARMONISED CLAUSES OF THIS STANDARD	
		Type A	Type B	Type A	Type B
1.0.4	Design to cope with surrounding area conditions	YES	YES	4.2.1	4.2.1
1.0.5	Marking	YES	YES	5.7	6.7
1.0.6	Instructions	YES	YES	C.2	C.4
(a)	All equipment must be accompanied by instructions	YES	YES	C.2	C.4
-	recapitulation of marking information	YES	YES	C.2	C.4
-	instructions for safe installation, use, maintenance	NO	NO		
-	indication of danger areas by pressure relief devices	NO	NO		
-	training instructions	NO	NO		
-	assessment of safe operation in expected conditions	NO	NO		
-	electrical, pressure, temperature parameter limits	NO	NO		
-	special conditions of use and possible misuse	NO	NO		
-	essential characteristics of tools which may be fitted	NO	NO		
(b)	Instructions – translation into Community languages	YES	YES	C.2	C.4
(c)	Instructions – diagrams necessary for correct use etc	YES	YES	C.2	C.5
(d)	Literature must not contradict instructions for safety	NO	NO		
1.1	Selection of materials	NO	NO		
1.1.1	materials must not trigger off an explosion	YES	YES	Error! Reference source not found.	Error! Reference source not found.
1.1.2	no reaction of materials and explosive atmosphere	YES	YES	4.2.2; Error! Reference source not found.	4.2.2; Error! Reference source not found.
1.1.3	no reduction in protection due to corrosion, wear, etc	YES	YES	4.2.1; 4.2.2; 4.2.3; Error! Reference source not found.	4.2.1; 4.2.2; 4.2.3; Error! Reference source not found.
1.2	Design and Construction	NO	NO		
1.2.1	technological knowledge	YES	YES	4.1; 4.2; Error! Reference source not found.	4.1; 4.2; Error! Reference source not found.

I.S. EN 13616:2004

EN 13616:2004/AC:2006 (E/F/D)

CLAUSE	DESCRIPTION (PARAPHRASED)	APPLICABLE (YES/NO?)		HARMONISED CLAUSES OF THIS STANDARD	
		Type A	Type B	Type A	Type B
					found.
1.2.2	replacement components to function safely	NO	NO		
1.2.3	enclosed structures and prevention of leaks	YES	NO		
1.2.4	dust deposit	NO	NO		
1.2.5	additional means of protection	YES	YES	4.2; Error! Reference source not found.	4.2; Error! Reference source not found.
1.2.6	safe opening	NO	NO		
1.2.7	protection against other hazards	NO	NO		
1.2.8	overloading of equipment	NO	NO		
1.2.9	flameproof enclosure systems	NO	YES		Error! Reference source not found.
1.3	Potential ignition sources	NO	NO		
1.3.1	hazards arising from different ignition sources	YES	YES	4.2; Error! Reference source not found.	4.2; Error! Reference source not found.
1.3.2	hazards arising from static electricity	YES	YES	4.2.2; Error! Reference source not found.	4.2.2; Error! Reference source not found.
1.3.3	hazards arising from stray electric & leakage current	NO	NO		
1.3.4	hazards arising from overheating	NO	NO		
1.3.5	hazards arising from pressure compensations	NO	NO		
1.4	Hazards arising from external effects	NO	NO		
1.4.1	safety in presence of voltages humidity vibration etc	YES	YES	4.1; 4.2	4.1; 4.2
1.4.2	mechanical & thermal stress, aggressive substances	YES	YES	4.1; 4.2	4.1; 4.2
1.5	Requirements in respect to safety-related devices	NO	NO		
1.5.1	detection of failure of safety devices – fail safe	NO	YES		A.1.4
1.5.2	system security in the event of safety device failure	NO	YES		A.1.4
1.5.3	emergency stop control lockout devices	NO	NO		
1.5.4	control and display units	NO	YES		6.2

I.S. EN 13616:2004

EN 13616:2004/AC:2006 (E/F/D)

CLAUSE	DESCRIPTION (PARAPHRASED)	APPLICABLE (YES/NO?)		HARMONISED CLAUSES OF THIS STANDARD	
		Type A	Type B	Type A	Type B
1.5.5	explosion protection devices (measuring functions)	NO	YES		Error! Reference source not found.
1.5.6	serviceability of devices with a measuring function	NO	NO		
1.5.7	safety factor of devices with a measuring function	NO	NO		
1.5.8	risks arising from software	NO	NO		
1.6	Integration of safety requirements relating to system	NO	YES		A.1.6
2	SUPPLEMENTARY REQUIREMENTS OF EQUIPMENT	NO	NO		
2.0	Requirements for category M of equipment group I	NO	NO		
2.1	Requirements for category 1 of equipment group II	NO	NO		
2.1.1	Explosive atmosphere due to gases/vapours/hazes	NO	NO		
2.1.1.1	No sources of ignition even in event of rare incidents	NO	YES		Error! Reference source not found.
-	either an independent second means of protection or	NO	NO		
-	protection ensured in event of 2 independent faults	NO	NO		
2.1.1.2	temperature limit on surfaces can never be exceeded	NO	NO		
2.1.1.3	opening of parts having possible sources of ignition	NO	YES		Error! Reference source not found.
2.1.2	explosive atmospheres caused by air/dust mixtures	NO	NO		
2.2	Requirements for category 2 of equipment group II	NO	NO		
2.2.1	explosive atmospheres due to gases/vapours/mists	NO	NO		
2.2.1.1	no sources of ignition in event of operating faults	NO	YES		Error! Reference source not found.
2.2.1.2	stated surface temperatures are not exceeded	NO	NO		
2.2.1.3	opening of parts having possible sources of ignition	NO	YES		Error! Reference source not found.
2.2.2	explosive atmospheres caused by air/dust mixtures	NO	NO		

I.S. EN 13616:2004
EN 13616:2004/AC:2006 (E/F/D)

CLAUSE	DESCRIPTION (PARAPHRASED)	APPLICABLE (YES/NO?)		HARMONISED CLAUSES OF THIS STANDARD	
		Type A	Type B	Type A	Type B
2.3	Requirements for category 3 of equipment group II	NO	NO		
2.3.1	explosive atmospheres due to gases/vapours/mists	NO	NO		
2.3.1.1	no sources of ignition during normal operation	NO	YES		Error! Reference source not found.
2.3.1.2	surface temperatures limited in normal conditions	NO	NO		
2.3.2	explosive atmospheres caused by air/dust mixtures	NO	NO		
3	SUPPLEMENTARY REQUIREMENTS IN RESPECT OF PROTECTIVE SYSTEMS	NO	NO		
3.0	General requirements				
3.0.1	Protective systems must be dimensioned	NO	NO		
3.0.2	Protective systems must be designed	NO	NO		
3.0.3	In the event of a power failure, protective systems	NO	YES		4.1.5
3.0.4	Protective systems must not fail	NO	NO		
3.1	Planning and design	NO	NO		
3.1.1	Characteristics of materials	NO	NO		
3.1.2	Protective systems designed to resist	NO	NO		
3.1.3	Accessories connected to protective systems	NO	NO		
3.1.4	The reactions caused by pressure	NO	NO		
3.1.5	Pressure-relief systems	NO	NO		
3.1.6	Explosion suppression systems	NO	NO		
3.1.7	Explosion decoupling systems	NO	NO		
3.1.8	Protective systems must be capable	NO	NO		

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

ICS 23.020.10; 75.200

English version

Overfill prevention devices for static tanks for liquid petroleum fuels

Dispositifs limiteurs de remplissage pour réservoirs
statiques pour carburants pétroliers liquides

Überfüllsicherungen für ortsfeste Tanks für flüssige Brenn-
und Kraftstoffe

This European Standard was approved by CEN on 8 April 2004.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of 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.



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	page
Foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms, definitions and abbreviated terms	6
4 General requirements.....	8
5 Overfill prevention device Type A.....	9
6 Overfill prevention device Type B.....	13
Annex A (normative) Test methods for overfill prevention device Type B.....	33
Annex B (normative) Test rigs layouts for overfill prevention device Type A	45
Annex C (informative) Additional information for overfill prevention devices Types A and B	46
Annex D (normative) System of evaluation of conformity	48
Annex E (informative) Information on explosion protected equipment	50
Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of the Equipment and Protective Systems intended for use in potentially explosive atmospheres Directive.....	51
Annex ZB (informative) Clauses of this European Standard addressing essential requirements or other provisions of the Electromagnetic Compatibility Directive	55
Annex ZC (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Directive.....	56
Bibliography	60
Figures	
Figure 1 — Current interface mechanical for the controller.....	15
Figure 2 — Current interface mechanical for the sensor	16
Figure 3 — Current interface (electrical)	17
Figure 4 — Voltage interface waveform	18
Figure 5 — Timing diagram standard PID	21
Figure 6 — PID schematic wiring diagram	22
Figure 7 — Standard PID response.....	23
Figure 8 — Standard PID Bit coding	24
Figure 9 — Bidirectional interrogator at standard PID	26
Figure 10 — Bidirectional interrogator at bidirectional PID	27
Figure 11 — Nested PRD requests on bidirectional PID.....	28
Figure 12 — Standard interrogator at bidirectional PID	29
Figure 13 — Bidirectional PID Bit coding.....	29
Figure A.1 — Layout test for sensor.....	36
Figure A.2 — Layout test for controller	37
Figure A.3 — PID test circuit	39

Figure A.4 — PID test circuit voltage waveform.....	39
Figure A.5 — Bytestream, overfill information not available	41
Figure A.6 — Bytestream, overfill sensor dry.....	41
Figure A.7 — Bytestream, overfill sensor wet	42
Figure A.8 — Bytestream, overfill sensor defect.....	42
Figure A.9 — Hose simulator.....	43
Figure B.1 — Test rig layout.....	45
Figure ZC.1 — Example CE marking information for overfill prevention device	59
Table 1 — DC electrical characteristics of PRD	19
Table 2 — AC electrical characteristics of PRD (bidirectional PRD only)	20
Table 3 — Operating conditions of PID	20
Table 4 — DC electrical characteristics of PID	20
Table 5 — AC electrical characteristics of PID	21
Table 6 — Diode and electro-static discharge protection	22
Table 7 — Standard PID Byte framing	24
Table 8 — Standard PID telegram	24
Table 9 — Standard PID message format	25
Table 10 — Standard PID message #1.....	26
Table 11 — Bidirectional PID Byte framing.....	30
Table 12 — Bidirectional PID request message format	30
Table 13 — Bidirectional PID response message format	31
Table 14 — Bidirectional PID data identifier	32
Table 15 — Classification	32
Table A.1 — Connection	38
Table A.2 — Dynamic tests.....	40
Table A.3 — PID simulator settings	43
Table C.1 — Diameter and flow rate	46
Table E.1 — Standard protection concepts allowed.....	50
Table ZA.1 — Comparison between Directive 94/9/EC and this European Standard.....	51
Table ZB.1 — Comparison between Directive 89/336/EEC and this European Standard	55
Table ZC.1 — Relevant clauses for product and intended use.....	56
Table ZC.2 — Attestation of conformity systems.....	57
Table ZC.3 — Assignment of evaluation of conformity tasks under system 3 for overfill prevention devices used for storage of fuel	57
Table ZC.4 — Assignment of evaluation of conformity tasks under system 4 for overfill prevention devices used for storage of water not intended for human consumption	58

Foreword

This document (EN 13616:2004) 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 January 2005, and conflicting national standards shall be withdrawn at the latest by April 2006.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of the Equipment and protective systems intended for use in potentially explosive atmospheres Directive (ATEX)¹⁾, Electromagnetic Compatibility Directive (EMC)²⁾ and Construction Products Directive (CPD)³⁾.

For the relationship with the Directives 94/9/EC, 89/336/EEC and 89/106/EEC, respectively see informative annexes ZA, ZB and ZC which are an integral part of this document.

By application of this European Standard presumption is given, that the Essential Safety Requirements of the ATEX, EMC and CPD Directives are met.

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) Directive 94/9/EC of the European Parliament and of the Council of 23 March 1994 on the approximation of the laws of the Member States concerning Equipment and protective systems intended for use in potentially explosive atmospheres (OJEC L 100).

2) Directive 89/336/EEC of the European Parliament and of the Council of 03 May 1989 on the approximation of the laws of the Member States concerning Electromagnetic compatibility (OJEC L 139).

3) Directive 89/106/EEC of the European Parliament and the Council of 21 December 1988 on the approximation of the laws of the Member States concerning Construction products (OJEC L 40).

Introduction

This document has been written to limit environmental damage and the risk of pollution to water and any fire or explosion risk during the filling of storage tanks with liquid petroleum fuels.

This document has been written by CEN/TC 221 covering the whole range of static shop fabricated tanks and their equipment for the storage of liquid petroleum fuels.

1 Scope

This standard specifies the minimum performance and construction requirements for various types of overfill prevention devices which are limited to static tanks of shop fabricated manufacture both metallic and non metallic. It covers devices for underground tanks and also above ground tanks with a maximum height of 5 m.

To cover the different types of overfill prevention devices, two types have been developed:

- Type A: An overfill prevention device where the operation does not depend on the road tank vehicle or supply system;
- Type B: An overfill prevention device where the operation depends on the road tank vehicle or the supply system.

This standard applies to overfill prevention devices for liquid petroleum fuels, having a flash point up to but not exceeding 100 °C. The requirements apply to overfill prevention devices suitable for use at ambient temperatures in the range from –25 °C to +60 °C, and subject to normal operational pressure variations.

Additional measures may be required for use at temperatures outside this range and are the subject of negotiation between the manufacturer and its client.

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 590, *Automotive fuels — Diesel – Requirements and test methods*

EN 954–1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

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

EN 50020, *Electrical apparatus for potentially explosive atmospheres — Intrinsic safety « i »*

EN 60204-1, *Safety of machinery – Electrical equipment of machines – Part 1: General requirements (IEC 60204-1:1997)*

EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN 61000-6-1, *Electromagnetic compatibility (EMC) - Part 6-1: Generic standards; Immunity for residential, commercial and light-industrial environments (IEC 61000-6-1:1997, modified)*

EN 61000-6-2, *Electromagnetic compatibility (EMC) - Part 6-2: Generic standards; Immunity for industrial environments (IEC 61000-6-2:1999, modified)*

EN 61000-6-3, *Electromagnetic compatibility (EMC) - Part 6-3: Generic standards; Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3:1996, modified)*

EN 61000-6-4, *Electromagnetic compatibility (EMC) - Part 6-4: Generic standards; Emission standard for industrial environments (IEC 61000-6-4:1997, modified)*

3 Terms, definitions and abbreviated terms

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

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-