

Explosion resistant equipment

The European Standard EN 14460:2006 has the status of a
British Standard

ICS 13.230

National foreword

This British Standard was published by BSI. It is the UK implementation of EN 14460:2006.

The UK participation in its preparation was entrusted to Technical Committee FSH/23, Fire precautions in industrial and chemical plant.

A list of organizations represented on FSH/23 can be obtained on request to its secretary.

Additional information

This harmonized European Standard gives requirements for the construction of process vessels or systems in which a potentially explosive atmosphere may occur, and which are subject to explosion protection techniques.

It does not give requirements for the design of explosion protection for either electrical or non-electrical (mechanical) equipment intended for use in explosive atmospheres and should not be used for such designs.

Requirements for the explosion protection of electrical equipment intended for use in explosive atmospheres are given in the BS EN 60079 series of standards. Techniques for the explosion protection of mechanical equipment intended for use in explosive atmospheres are given in the BS EN 13463 series of standards.

Explosion protection of process vessels or systems can be achieved by the application of:

- 1. Venting the requirements of which are given in:
BS EN 14797, Explosion venting devices
BS EN 14491, Dust explosion venting protective systems
BS EN 14994, Gas explosion venting protective systems
- 2. Suppression the requirements of which are given in:
BS EN 14373, Explosion suppression systems
- 3. Containment the requirements of which are given in this standard.

The requirements of this standard should be applied to the construction of a process vessel or system when any of the above explosion protection techniques are applied. The essential requirement is that the vessel or system should suffer no unintended rupture. When either venting or suppression is applied explosion pressures stay relatively low, but when the chosen protection technique is Containment, it is important to understand what containment means.

Explosion containment is a technique whereby the explosion is totally sealed inside the process plant or system. The process plant or system is therefore designed so that it does not rupture under the very highest explosion pressures generated; that is, there is no escape of either flame or pressure into the surroundings.

In the application of all explosion protection methods it may be necessary to take into account isolation techniques that prevent explosions from propagating between items of process plant. Requirements for explosion isolation techniques are given in harmonized standards currently being prepared by CEN TC 305 WG 3.

It may be necessary also to take into account pressure piling effects that may occur due to flame propagation either through connecting pipelines between process vessels or through structures inside a single vessel.

Other factors specific to an installation may also need to be considered.

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

Compliance with a British Standard cannot confer immunity from legal obligations.

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English Version

Explosion resistant equipment

Appareil résistant à l'explosion

Explosionsfeste Geräte

This European Standard was approved by CEN on 23 March 2006.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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Contents

	Page
Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 Explosion resistant equipment	7
4.1 General.....	7
4.2 Design pressure.....	7
4.3 Design temperature	8
4.4 Additional loads	8
4.5 Wall thickness allowance.....	8
5 Explosion-pressure-resistant design	8
6 Explosion-pressure-shock resistant design	8
6.1 General.....	8
6.2 Design and manufacture according to EN 13445 with modified design criteria.....	9
6.3 Testing	11
7 Documentation of quality of explosion resistant equipment.....	12
7.1 Pressure vessels.....	12
7.2 Materials	12
7.3 Welding	12
7.4 Examination and test.....	12
8 Information for use	13
8.1 Marking	13
8.2 Accompanying documents.....	13
Annex A (normative) Calculation of design pressure	14
Annex B (informative) Examples for limitation of stress concentration	15
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 94/9/EC	17
Bibliography	18
Figures	
Figure 1 — Explosion resistant equipment.....	7
Figure 2 — Measures at openings.....	10
Tables	
Table 1 — Values of factor F in accordance to Equation (4).....	12
Table ZA.1 — Correspondence between this European Standard and Directive 94/9/EC	17

Foreword

This document (EN 14460:2006) has been prepared by Technical Committee CEN/TC 305 “Potentially explosive atmospheres – Explosion prevention and protection”, 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 November 2006, and conflicting national standards shall be withdrawn at the latest by November 2006.

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 94/9/EC of 23 March 1994.

For relationship with EU Directive 94/9/EC, 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

The principles of integrated explosion safety includes the following measures the manufacturer has to take:

- a) prevention of formation of explosive atmospheres;
- b) prevention of the ignition of the explosive atmospheres; and
- c) if an explosion nevertheless occurs, to halt it immediately and/or to limit the range of explosion flames and explosion pressures to a sufficient level of safety.

It is essential that methods according to c) be used if the ignition hazard assessment of the equipment shows that the prevention of ignition sources, e.g. by using of types of ignition protection as defined in EN 13463 series, doesn't fulfil the requirements of the intended category which is necessary for the intended use of the equipment. This standard specifies requirements for equipment that shall be explosion resistant. Explosion resistance is the term applied to the construction of an enclosure so that it can withstand an expected explosion pressure without rupture. Giving equipment this property it limits the range of explosion flames and explosion pressures to a sufficient level of safety.

The equipment property "explosion resistance" can be used for equipment, protective systems and components.

1 Scope

This standard specifies requirements for explosion-pressure-resistant and explosion pressure shock-resistant equipment. This standard is applicable to process vessels and systems. It is not applicable to individual items of equipment such as motors and gearboxes that may be designed to withstand an internal explosion, which is the subject of EN 13463-3.

This standard is valid for atmospheres having pressures ranging from 800 hPa to 1100 hPa and temperatures ranging from - 20 °C to + 60 °C. This standard may also be helpful for the design, construction, testing and marking of equipment intended for use in atmospheres outside the validity range stated above, as far as this subject is not covered by specific standards.

This standard applies to equipment and combinations of equipment where deflagrations may occur and is not applicable to equipment and combination of equipment where detonation may occur. This standard should not be used for offshore applications.

It is essential that this standard be used for equipment made of metallic materials only.

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 10002-1, *Metallic materials - Tensile testing - Part 1: Method of test at ambient temperature*

EN 10204, *Metallic products – Types of inspection documents*

EN 13237:2003, *Potentially explosive atmospheres - Terms and definitions for equipment and protective systems intended for use in potentially explosive atmospheres*

EN 13445-1, *Unfired pressure vessels – Part 1: General*

EN 13445-2, *Unfired pressure vessels – Part 2: Materials*

EN 13445-3, *Unfired pressure vessels – Part 3: Design*

EN 13445-4, *Unfired pressure vessels – Part 4: Fabrication*

EN 13980, *Potentially explosive atmospheres - Application of quality systems*

ISO 8421-1:1987, *Fire protection – Vocabulary - Part 1: General terms and phenomena of fire*