

PLAHVATUSKINDLAD SEADMED

Explosion resistant equipment

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

Explosion resistant equipment

Appareil résistant à l'explosion

Explosionsfeste Geräte

This European Standard was approved by CEN on 17 December 2017.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 14460:2018) 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of an identical text or by endorsement, at the latest by July 2018, and conflicting national standards shall be withdrawn at the latest by July 2018.

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

This document supersedes EN 14460:2006.

This document has been prepared under a standardization request 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, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The principles of integrated explosion safety include the following measures the manufacturer needs 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.

If the ignition hazard assessment of the equipment shows that the prevention of ignition sources does not fulfil the requirements of the category for the intended use of the equipment, it is essential that methods according to c) are used.

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.

The term “explosion resistance” may be applied to equipment, components and protective systems.

1 Scope

This European Standard specifies requirements for explosion resistant equipment which will be able to withstand an internal explosion without rupturing and will not give rise to dangerous effects to the surroundings. It is applicable to equipment (vessels and systems) where explosions are considered to be an exceptional load case.

There are two types of explosion resistant equipment: explosion pressure resistant and explosion pressure shock-resistant equipment (see Figure 1).

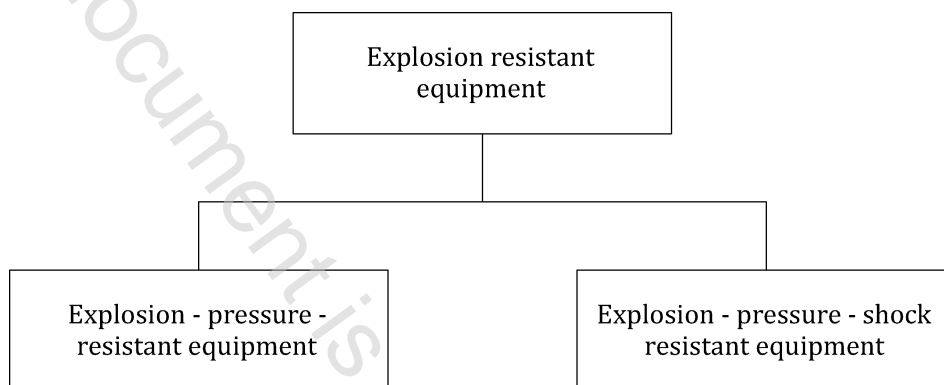


Figure 1 — Explosion resistant equipment

Explosion pressure resistant equipment is designed to withstand the explosion pressure without permanent deformation and will not give rise to dangerous effects to the surroundings. Since the design and calculation methods for explosion pressure resistant equipment are similar to those described in EN 13445-1 to -6 “Unfired pressure vessels” they are not repeated in this standard.

For explosion pressure shock resistant equipment permanent deformation is allowed provided the equipment will not give rise to dangerous effects to the surroundings. This design has been developed especially for explosion protection purposes. This standard focusses on the requirements for explosion pressure shock resistant equipment.

This standard is valid for atmospheres having absolute pressures ranging from 800 mbar to 1 100 mbar and temperatures ranging from $-20\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$. 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 detonations may occur. In this case, different design criteria for the required explosion resistance are applicable which are not covered by this standard.

It is not applicable to equipment which is designed according to type of protection, flameproof enclosures “d” (EN 13463-3 or EN 60079-1).

This standard does not apply to offshore situations.

This standard is only applicable for equipment where metallic materials provide the explosion resistance. This standard does not cover fire risk associated with the explosions, neither with the materials processed nor with the materials used for construction.

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 10204:2004, *Metallic products — Types of inspection documents*

EN 13018, *Non-destructive testing — Visual testing — General principles*

EN 13237:2012, *Potentially explosive atmospheres — Terms and definitions for equipment and protective systems intended for use in potentially explosive atmospheres*

EN ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1)*

EN ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel (ISO 9712)*

EN ISO/IEC 80079-34, *Explosive atmospheres — Part 34: Application of quality systems for equipment manufacture (ISO/IEC 80079-34)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13237:2012 and the following apply.

3.1

bolted structure

structures with bolted connections of which the design is not covered in published standards

Note 1 to entry: Bolted structures will be distinguished from flanged structures which can be designed according to engineering standards. Examples for bolted structures in the sense of this standard are rectangular flanges, fixing of metal sheets with bolts to a steel frame or overlapping sheet constructions.

3.2

maximum allowable explosion pressure

P_{exmax}

maximum explosion pressure which the equipment will withstand

4 Explosion pressure shock resistant equipment

4.1 General

This standard focusses on the requirements for explosion-pressure-shock resistant equipment.

With explosion-pressure-shock resistant equipment permanent deformation is allowed provided the equipment will not give rise to dangerous effects to the surroundings. The tolerable extent of effects on the surroundings depends on the intended use of the equipment. Formation of missiles or the rupture of individual parts of the equipment (e.g. gaskets) shall be considered as dangerous effects under any condition.

In general, a distinction is made between the following designs:

- design for the maximum explosion pressure;