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Explosive atmospheres - Explosion prevention and
protection - Part 1: Basic concepts and methodology
(corrected version 09.2019)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 1127-1:2019 sisaldab Euroopa standardi EN 1127-1:2019 ingliskeelset teksti.	This Estonian standard EVS-EN 1127-1:2019 consists of the English text of the European standard EN 1127-1:2019.
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English Version

Explosive atmospheres - Explosion prevention and
protection - Part 1: Basic concepts and methodology

Atmosphères explosives - Prévention de l'explosion et
protection contre l'explosion - Partie 1 : Notions
fondamentales et méthodologie

Explosionsfähige Atmosphären - Explosionsschutz -
Teil 1: Grundlagen und Methodik

This European Standard was approved by CEN on 3 June 2019.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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European foreword

This document (EN 1127-1:2019) 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of an identical text or by endorsement, at the latest by February 2020, and conflicting national standards shall be withdrawn at the latest by February 2022.

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

This document supersedes EN 1127-1:2011.

Annex D provides details of significant technical changes between this document and the previous edition EN 1127-1:2011.

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 Directives.

For relationship with EU Directives, see informative Annex ZA and ZB, which are integral parts of this document.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

CEN and CENELEC are producing a set of standards to assist designers, manufacturers and other interested bodies to interpret the essential safety requirements in order to achieve conformity with European Legislation. Within this series of standards CEN has undertaken to draw up a standard to give guidance in the field of explosion prevention and protection, as hazards from explosions are intended to be considered in accordance with EN ISO 12100:2010.

In accordance with EN ISO 12100:2010, it is a type B standard.

This standard describes the basic concepts and methodology of explosion prevention and protection.

CEN/TC 305 has a mandate in this area to produce B-type, and C-type standards, which will allow verification of conformity with the essential safety requirements.

Explosions can occur from:

- a) materials processed or used by the equipment, protective systems and components;
- b) materials released by the equipment, protective systems and components;
- c) materials in the vicinity of the equipment, protective systems and components;
- d) materials of construction of the equipment, protective systems and components.

Since safety depends not only on equipment, protective systems and components but also on the material being handled and its use, this standard includes aspects related to the intended use and foreseeable misuse, i.e. the manufacturer should consider in which way and for which purpose the equipment, protective systems and components will be used and take this into account during its design and construction. This is the only way hazards inherent in equipment, protective systems and components can be reduced.

NOTE This standard can also serve as a guide for users of equipment, protective systems and components when assessing the risk of explosion in the workplace and selecting the appropriate equipment, protective systems and components.

1 Scope

This document specifies methods for the identification and assessment of hazardous situations leading to explosion and the design and construction measures appropriate for the required safety. This is achieved by:

- risk assessment;
- risk reduction.

The safety of equipment, protective systems and components can be achieved by eliminating hazards and/or limiting the risk, i.e. by:

- a) appropriate design (without using safeguarding);
- b) safeguarding;
- c) information for use;
- d) any other preventive measures.

Measures in accordance with a) (prevention) and b) (protection) against explosions are dealt with in Clause 6, measures according to c) against explosions are dealt with in Clause 7. Measures in accordance with d) are not specified in this document. They are dealt with in EN ISO 12100:2010, Clause 6.

The preventive and protective measures described in this document will not provide the required level of safety unless the equipment, protective systems and components are operated within their intended use and are installed and maintained according to the relevant codes of practice or requirements.

This document specifies general design and construction methods to help designers and manufacturers in achieving explosion safety in the design of equipment, protective systems and components.

This document is applicable to any equipment, protective systems and components intended to be used in potentially explosive atmospheres, under atmospheric conditions. These atmospheres can arise from flammable/combustible substances processed, used or released by the equipment, protective systems and components or from materials in the vicinity of the equipment, protective systems and components and/or from the materials of construction of the equipment, protective systems and components.

This document is applicable to equipment, protective systems and components at all stages of its use.

This document is only applicable to equipment group II which is intended for use in other places than underground parts of mines and those parts of surface installations of such mines endangered by firedamp and/or combustible dust.

This document is not applicable to:

- 1) medical devices intended for use in a medical environment;
- 2) equipment, protective systems and components where the explosion hazard results exclusively from the presence of explosive substances or unstable chemical substances;
- 3) equipment, protective systems and components where the explosion can occur by reaction of substances with other oxidizers than atmospheric oxygen or by other hazardous reactions or by other than atmospheric conditions;

- 4) equipment intended for use in domestic and non-commercial environments where potentially explosive atmospheres may only rarely be created, solely as a result of the accidental leakage of fuel gas;
- 5) personal protective equipment covered by Regulation (EU) 2016/425;
- 6) seagoing vessels and mobile offshore units together with equipment on board such vessels or units;
- 7) means of transport, i.e. vehicles and their trailers intended solely for transporting passengers by air or by road, rail or water networks, as well as means of transport insofar as such means are designed for transporting goods by air, by public road or rail networks or by water; vehicles intended for use in a potentially explosive atmosphere shall not be excluded;
- 8) the design and construction of systems containing desired, controlled combustion processes, unless they can act as ignition sources in potentially explosive atmospheres.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 13237:2012, *Potentially explosive atmospheres — Terms and definitions for equipment and protective systems intended for use in potentially explosive atmospheres*

EN 15198:2007, *Methodology for the risk assessment of non-electrical equipment and components for intended use in potentially explosive atmospheres*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

EN ISO 80079-36:2016, *Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

normal tightness

absence of leakage when any of the tightness tests or tightness monitorings appropriate for the application does not reveal any hazardous leaks during normal operation

3.2

enhanced tightness

absence of leakage when due to the design and measures of maintenance any of the tightness tests or tightness monitorings appropriate for the application does not reveal any hazardous leaks during normal operations and expected malfunctions