

**Explosiv atmosfär – Metodik för riskbedömning  
av icke elektriska utrustningar och komponenter**

**Methodology for the risk assessment of non-  
electrical equipment and components for  
intended use in potentially explosive  
atmospheres**

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English Version

**Methodology for the risk assessment of non-electrical equipment  
and components for intended use in potentially explosive  
atmospheres**

Méthodes pour l'évaluation du risque d'inflammation des  
appareils et des composants non électriques destinés à  
être utilisés en atmosphères explosibles

Methodik zur Risikobewertung für nicht-elektrische Geräte  
und Komponenten zur Verwendung in  
explosionsgefährdeten Bereichen

This European Standard was approved by CEN on 13 July 2007.

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

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## **Foreword**

This document (EN 15198:2007) 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of an identical text or by endorsement, at the latest by February 2008, and conflicting national standards shall be withdrawn at the latest by February 2008.

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

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.

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, Bulgaria, 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 the United Kingdom.

## EN 15198:2007 (E)

### Introduction

The function of this type A standard (description of general principles) as defined in CEN Guide 414 is to describe principles for a consistent systematic procedure for ignition risk assessment depending on Group II or Group I equipment.

Annex A is informative and contains examples for ignition risk assessment.

This European Standard does not provide means to prove the conformity of equipment categories. The procedure of ignition risk assessment for the design of equipment and components lead to a defined safety level which allows categorisation according to the appropriate criteria.

It is in both the manufacturer's and user's interest to establish a common methodology for achieving safety, reliability and efficacy in functioning and operating equipment and components with respect to the ignition hazards. Thus, ignition risk assessment is a tool which provides the essential link between manufacturers and users, but only aspects that directly address manufacturers are incorporated.

Integrated explosion safety is conceived to prevent the formation of explosive atmospheres as well as sources of ignition and, should an explosion nevertheless occur, to halt it immediately and / or to limit its effects. In this connection, the manufacturer must take measures with respect to the potential ignition sources. In addition, equipment and component must be designed and constructed after due analysis of possible operating faults in order as far as possible to preclude dangerous situations taking the misuse which can reasonably be anticipated into account. Therefore it is absolutely necessary to conduct an ignition risk assessment process.

For the equipment and components the identification of the potential ignition sources is the most relevant part of the ignition risk assessment.

## 1 Scope

This European Standard specifies basic methodology used in achieving safety of equipment for intended use in potentially explosive atmospheres.

The provisions specified in this European Standard are intended for the designer. It also specifies a strategy for standard makers.

This European Standard specifies the procedure and information required to allow ignition risk assessment to be carried out for the design of equipment or component.

This European Standard provides advice for a decision to be made for the categorisation of equipment but does not provide means to prove the conformity of equipment categories.

In this procedure the following information is to be taken into account:

- a) Possible occurrence of an explosive atmosphere inside the equipment or component or penetrating the equipment or component from the outside (in normal operation or during malfunctions) and the amount of explosive atmosphere involved leading to possible explosion impact inside of the equipment or component;
- b) equipment or components surrounded by an explosive atmosphere (in normal operation or during malfunctions);
- c) equipment or components wholly or partly surrounded by an explosive atmosphere considering also any explosive atmosphere in connection (in normal operation or during malfunctions);
- d) presence and likelihood (effectiveness) of ignition sources.

The final objective is designing and manufacturing equipment or components intended for use in potentially explosive atmospheres. For this purpose equipment or components if necessary should be designed with adequate preventive and/or protective measures.

This European Standard specifies neither specific methods of analysis associated with ignition risk assessment, nor specific requirements for a category of equipment. It describes the methodology of ignition risk assessment.

This European Standard does not apply to equipment with a potentially explosive atmosphere inside under operating conditions, and without interfaces to an external potentially explosive atmospheres.

This European Standard is applicable to all categories of equipment referred to in EN 13463-1.

This ignition risk assessment procedure does not preclude the conditions prevailing in an installation where the equipment or component is put into operation by a user.

NOTE Functional safety assessment of protective systems is covered by EN 15233.

## 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 1127-1, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology*

## EN 15198:2007 (E)

EN 1127-2, *Explosive atmospheres — Explosion prevention and protection — Part 2: Basic concepts and methodology for mining*

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

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13237:2003 and the following apply.

- 3.1 ignition risk**  
probability of occurrence of an ignition source that is capable of igniting an explosive atmosphere
- 3.2 ignition hazard**  
occurrence of a potential ignition source that is capable of igniting an explosive atmosphere
- 3.3 potential ignition source**  
equipment related ignition source that has the capability to ignite an explosive atmosphere (i.e. to become an effective ignition source)
- 3.4 protective measure**  
means used to reduce the probability of an ignition source to become effective
- 3.5 ignition risk estimation**  
determination of the probability of the occurrence of an ignition source
- 3.6 ignition risk evaluation**  
procedure to determine whether the intended level of protection (related to the equipment category) has been achieved

### 4 General requirements

#### 4.1 Basic concept

Ignition risk assessment is a series of logical steps (see Figure 1) that enable designers and safety engineers to examine in a systematic way, the function of an equipment or component arising from its use in a potentially explosive atmosphere and to decide whether protective measures and/or type of protection are needed. The objective shall be to achieve an adequate level of safety.

Ignition risk assessment includes the following four steps:

- a) product description: performance, lifetime, configuration (see 5.2),
- b) identification of ignition hazards (see 5.3),
- c) ignition risk estimation (see 5.4),
- d) ignition risk evaluation (see 5.5).

These four steps are the basis for the decision whether the intended safety level is achieved (see 5.6). The result of the assessment shall be detailed in the technical documentation (see Clause 6).