Mitteelelektrilised seadmed plahvatusohtlike keskkondade jaoks. Osa 3: Kaitsmine tulekindla ümbrise 'd' abil

Non-electrical equipment for use in potentially explosive atmospheres - Part 3: Protection by flameproof enclosure 'd'

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 13463-3:2005 sisaldab Euroopa standardi EN 13463-3:2005 ingliskeelset teksti. Käesolev dokument on jõustatud 22.06.2005 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 13463-3:2005 consists of the English text of the European standard EN 13463-3:2005. This document is endorsed on 22.06.2005 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This European Standard specifies the requirements for the design, assessment, construction and testing of equipment intended for use in potentially explosive gas or dust atmospheres, protected by the type of protection Flameproof enclosure d	**Scope:** This document specifies the requirements for the design, assessment, construction and testing of equipment intended for use in potentially explosive gas or dust atmospheres, protected by the type of protection: Flameproof enclosure "d".

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Non-electrical equipment for use in potentially explosive atmospheres - Part 3: Protection by flameproof enclosure 'd'

Appareils non électriques destinés à être utilisés en atmosphères explosibles - Partie 3 : protection par enveloppe antidéflagrante 'd'

Nicht-elektrische Geräte für den Einsatz in explosionsgefährdeten Bereichen - Teil 3: Schutz durch druckfeste Kapselung 'd'

This European Standard was approved by CEN on 15 March 2005.

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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 Central Secretariat has the same status as the official versions.

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Contents

Foreword

This document (EN 13463-3:2005) 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 October 2005, and conflicting national standards shall be withdrawn at the latest by October 2005.

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 94/4EC of 23 March 1994.

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This document is to specify the requirements for the type of protection “Protection by flameproof enclosure” for equipment intended for use in potentially explosive atmospheres and should be used in conjunction with EN 13463-1 "Non-electrical equipment for potentially explosive atmospheres – Basic method and requirements".

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.

Introduction

Some types of non-electrical equipment intended for use in potentially explosive atmospheres of gas, vapour, mist and/or combustible dust, contain effective ignition sources in normal operation and these have to be prevented from becoming an ignition source for the surrounding atmosphere in which they are used. One way of achieving this is to enclose the ignition sources so that an ignition of the atmosphere inside the enclosure is not transmitted to the outside atmosphere. This document describes one such way, known as protection by "Flameproof enclosure 'd'".

The basic principle of ignition protection by the use of a flameproof enclosure, is that gases, or vapour, may enter the enclosure through the cover joints / flanges and if an explosive atmosphere inside the enclosure ignites, neither the enclosure will be deformed significantly, nor flame transmitted through the joints / flanges to the explosive atmosphere outside. For this reason the enclosure has to be both robust and have dimensionally controlled cover joints / flanges with maximum allowable safe gaps appropriate for the types of explosive gas / vapour likely to occur inside the equipment.

Since its conception, protection by flameproof enclosure has been developed to allow many kinds of continuously sparking equipment to be used safely in places where a potentially explosive atmosphere exists. For electrical equipment, this type of protection is well known for protecting power arcing components and is defined and described in EN 60079-1. As the electrical equipment standard contains the generic testing, verification and marking requirements, unnecessary duplication of the requirements in this non-electrical equipment document is avoided by cross reference to the electrical standard. In this document, only those differences necessary for the purpose of providing protection for non-electrical equipment are written in full.

In contrast to this document EN 60079-1 does not consider explosive atmospheres formed by dusts, except for Group I, category M2 electrical equipment, where its associated general requirements document, EN 60079-0, states that flameproof equipment designed, constructed and tested for use in explosive atmospheres of firedamp (explosive mine gas consisting mainly of methane) needs no alteration, or further testing to allow it to be used where a coal dust cloud is present.

The concept of protecting equipment against dust cloud ignition by testing it in a gas / air mixture is also accepted in this document for both Group I, Category M2 mining equipment, and Group II, Category 2G and 2D non-mining equipment. This is because it introduces an acceptable safety factor against ignition and it allows a much more simple method of testing and verifying its explosion protection properties.

Examples of non-electrical types of equipment that can be protected by flameproof enclosure are:

a) Equipment with potentially hot rubbing surfaces exceeding the ignition temperature of the atmosphere surrounding them, e.g. friction clutches and brake linings

b) equipment that has to operate at high temperature to function correctly, such as catalytic converters in the exhaust systems of flameproof internal combustion engines, or hot catalytic pellistors used in the sensors of flammable gas measuring instruments,

c) equipment producing incendive frictional sparks in normal operation.

Little equipment is currently made to flameproof designs for dust applications, because alternative designs using dust tight enclosures are usually cheaper. There are however non-mining applications where both dust and gas are present, where this document may be applicable.

Where dust alone is present, there is usually no mechanism to create inside an enclosure an explosive dust cloud, although deposits of dust may form. The risk from a fire involving dust deposits inside the enclosure is not considered by this document, as it falls outside the concept of protection by flameproof enclosure.

1 Scope

This document specifies the requirements for the design, assessment, construction and testing of equipment intended for use in potentially explosive gas or dust atmospheres, protected by the type of protection: Flameproof enclosure "d".

This document supplements the requirements in EN 13463-1, the contents of which also apply in full to equipment constructed to this document. Equipment complying with the relevant clauses of this document meets the requirements for the following categories:

— Equipment Group I Category M2 – that does not contain an ignition source arising from severe operating conditions, in particular arising from rough handling and changing environmental conditions;

— Equipment Group II Category 2G or 2D – that does not contain an ignition source arising as a result of foreseeable malfunctions.

The type of ignition protection described in the document can be used either on its own or in combination with other types of ignition protection to meet the requirements for equipment of Group I categories M2, or Group II categories 1 and 2 depending on the ignition hazard assessment in EN 13463-1.

NOTE The requirements for Group I Category M1 equipment are given in EN 50303, which specifies the requirements for both electrical and non-electrical equipment.

This document shall not be used for equipment intended for use in sulphur dust and organic peroxides because of the difficulty of testing and specifying the requirements

This document does not apply to the ignition protection of electrical equipment, or reciprocating internal combustion engines. For these requirements reference shall be made to EN 60079-0 and EN 60079-1 for electrical equipment and EN 1834-1, -2 and -3 for reciprocation internal combustion engines.

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 1127-1:1997, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology.*

EN 1127-2:2002, *Explosive atmospheres — Explosion prevention and protection — Part 2: Basic concepts and methodology for mining.*

EN 13463-1:2001, *Non-electrical equipment for potentially explosive atmospheres — Part 1: Basic method and requirements.*

EN 60079-0:2004, *Electrical apparatus for explosive gas atmospheres — Part 0: General requirements*.

EN 60079-1:2004, *Electrical apparatus for potentially explosive atmospheres — Part 1: Flameproof enclosure 'd'*.

3 Terms and Definitions

For the purposes of this document, the terms and definitions given in EN 1127-1:1997, EN 1127-2:2002, EN 13463-1:2001, EN 60079-0:2004 and EN 60079-1:2004 and the following apply.

3.1
flameproof enclosure
type of protection in which the parts which can ignite an explosive atmosphere are placed in an enclosure which can withstand the pressure developed during an internal explosion of an explosive mixture and which prevents the transmission of the explosion to the explosive atmosphere surrounding the enclosure.

[EN 13237:2003]