

**Elektriseadmed kasutamiseks põleva
tolmu olemasolu puhul . Osa 1-1:
Kaitsekestaga kaetud elektriseadmed .
Valmistamine ja katsetamine**

Electrical apparatus for use in the presence of
combustible dust - Part 1-1: Electrical apparatus
protected by enclosures - Construction and testing

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 50281-1-1:2001 sisaldab Euroopa standardi EN 50281-1-1 + Corr.:1998 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 19.06.2001 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 50281-1-1:2001 consists of the English text of the European standard EN 50281-1-1 + Corr.:1998.</p> <p>This document is endorsed on 19.06.2001 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala: This European Standard is applicable to electrical apparatus protected by enclosures for use in areas where combustible dust may be present in quantities which could lead to a fire or explosion hazard. This standard specifies requirements for design, construction, and testing of electrical apparatus. EN 50281-1-2 gives guidance on the selection, installation and maintenance of the apparatus.</p>	<p>Scope: This European Standard is applicable to electrical apparatus protected by enclosures for use in areas where combustible dust may be present in quantities which could lead to a fire or explosion hazard. This standard specifies requirements for design, construction, and testing of electrical apparatus. EN 50281-1-2 gives guidance on the selection, installation and maintenance of the apparatus.</p>
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Võtmesõnad: combustible dust, construction, electrical apparatus, testing

EUROPEAN STANDARD

EN 50281-1-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English version

Electrical apparatus for use in the presence of combustible dust
Part 1-1: Electrical apparatus protected by enclosures
Construction and testing

Matériels électriques destinés à être
utilisés en présence de poussières
combustibles
Partie 1-1: Matériels électriques
protégés par enveloppes
Construction et essais

Elektrische Betriebsmittel zur Verwen-
dung in Bereichen mit brennbarem Staub
Teil 1-1: Elektrische Betriebsmittel mit
Schutz durch Gehäuse
Konstruktion und Prüfung

This European Standard was approved by CENELEC on 1998-09-01. CENELEC 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 CENELEC 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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 31, Electrical apparatus for explosive atmospheres. The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50281-1-1 on 1998-09-01.

This European Standard was prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and supports the essential safety requirements of the EC Directive 94/9/EC.

This European Standard is to be read in conjunction with EN 50014:1997.

The following dates have been fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 1999-09-01
- latest date by which national standards conflicting
with the EN have to be withdrawn (dow) 1999-09-01

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Introduction

Combustible dust can be ignited by electrical apparatus in several main ways:

- by surfaces of the apparatus that are above the ignition temperature of the dust concerned temperature at which a dust ignites is a function of the properties of the dust, whether the dust is in a cloud or layer, the thickness of the layer and the geometry of the heat source;
- by arcing or sparking of electrical parts such as switches, contacts, commutators, brushes, or the like;
- by discharge of an accumulated electrostatic charge;
- by radiated energy (e.g. electromagnetic radiation);
- by mechanical sparking or frictional sparking or heating associated with the apparatus.

In order to avoid ignition hazards it is necessary that:

- the temperature of surfaces, on which dust can be deposited, or which would be in contact with a dust cloud, is to be kept below the temperature limitation specified in EN 50281-1-2;
- any electrical sparking parts, or parts having a temperature above the ignition temperature of the dust;
- are contained in an enclosure which adequately prevents the ingress of dust,
or
the energy of electrical circuits is limited as to avoid arcs, sparks or temperatures capable of igniting combustible dust;
- any other ignition sources are avoided.

Where the apparatus has to meet other environmental conditions, for example, protection against ingress of water and resistance to corrosion, the method of protection used shall not adversely affect the integrity of the enclosure.

The protection specified in this standard will not provide the required level of safety unless the relevant codes of practice or requirements, for example in respect of protection against over-current, the electrical apparatus is operated within its rating and is installed and maintained according to currents, internal short circuits, and other electrical faults. In particular, it is essential that the severity and duration of an internal or external fault be limited to values that can be sustained by the electrical apparatus without damage.

1 Scope

This European Standard is applicable to electrical apparatus protected by enclosure and temperature limitation for use in areas where combustible dust may be present in quantities which could lead to a fire or explosion hazard.

This standard specifies requirements for design, construction, and testing of electrical apparatus. EN 50281-1-2 gives guidance on the selection, installation and maintenance of the apparatus.

The ignition protection is based on the limitation of the maximum surface temperature of the enclosure and on the restriction of dust ingress into the enclosure by the use of "dust-tight" or "dust-protected" enclosures.

Apparatus within the scope of this standard may also be subjected to additional requirements in other publications - for example, EN 50014, Electrical apparatus for potentially explosive atmospheres.

The application of electrical apparatus in atmospheres which may contain explosive gas as well as combustible dust, whether simultaneously or separately, requires additional protective measures.

The principles of this standard may also be followed when combustible fibres or flyings cause a hazard.

This standard does not apply to dusts of explosives which do not require atmospheric oxygen for combustion, or to pyrophoric substances.

This Standard is not applicable to electrical apparatus for use in mines susceptible to firedamp; nor does it take account of any risk caused by an emission of flammable or toxic gas from the dust.

This standard does not include other types of protection and is only applicable to protection by enclosure and temperature limitation.

2 Normative references

EN 50014	1997	Electrical apparatus for potentially explosive atmospheres General requirements
EN 50019		Electrical apparatus for potentially explosive atmospheres Increased safety "e"
EN 50020		Electrical apparatus for potentially explosive atmospheres Intrinsic safety "i"
EN 50281-1-2		Electrical apparatus for use in the presence of combustible dust Part 1-2: Electrical apparatus protected by enclosures - Selection, installation and maintenance
EN 50281-2-1		Electrical apparatus for use in the presence of combustible dust Part 2-1: Test methods - Methods for determining the minimum ignition temperatures of dust

EN 60034-1	Rotating electrical machines Part 1: Rating and performance (IEC 60034-1:1996, modified)
EN 60034-5	Rotating electrical machines Part 5: Classification of degrees of protection provided by enclosures for rotating machinery (IEC 60034-5:1981, modified)
EN 60192	Low pressure sodium vapour lamps (IEC 60192:1973 + A1:1979 + A2:1988 + A3:1992)
EN 60243-1	Electrical strength of insulating materials - Test methods Part 1: Tests at power frequencies (IEC 60243-1:1998)
EN 60529	Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
EN 60662	High pressure sodium vapour lamps (IEC 60662:1980 & amendments)
HD 429	Methods of test for volume resistivity and surface resistivity of solid electrical insulating materials (IEC 60093:1980)
HD 611.1 S1	Guide for the determination of thermal endurance properties of electrical insulating materials Part 1: General guidelines for ageing procedures and evaluation of test results (IEC 60216-1:1990)
HD 611.2 S1	Guide for the determination of thermal endurance properties of electrical insulating materials Part 2: Choice of test criteria (IEC 60216-2:1990)
ISO 178	Plastics -- Determination of flexural properties
ISO 4225	Air Quality - General aspects - Vocabulary
ISO 527 (series)	Plastics -- Determination of tensile properties