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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

中华人民共和国国家标准

GB 12476.1-2000

Electrical apparatus for use in the presence of combustible dust—Part 1-1: Electrical apparatus protected by enclosures and surface temperature limitation—Specification for apparatus

可燃性粉尘环境用电气设备

第 1 部分：用外壳和限制表面温度保护的电气设备

第 1 节：电气设备的技术要求

Issued on October 17, 2000 **Implemented on July 01, 2001**

Issued by State Bureau of Quality Technical Supervision

Contents

Foreword

This standard is mandatory national standard.

This standard is identical to the IEC 61241-1-1: (second edition in 1999) *Electrical Equipments for Combustible Dust Environment Part 1-1: Electrical Equipments Protected with Shells and Limited Surface Temperature Technical Requirements for Electrical Equipments* and it is consistent with IEC 61241-1-1 in terms of technical contents and compiling rules.

This Standard is the basic standard of electrical equipments used in combustible dust environment.

This Standard has some differences with GB 12476.1- 1990, and the main difference includes:

1) The name of the standard *Explosion-proof Electrical Equipments for Combustible Dust Atmospheres--Dust Explosion-Protected Electrical Equipments* is modified as *Explosion-Protected Electrical Equipments for Combustible Dust Environment Part I : Electrical Equipments Protected with Shells and Limited Surface Temperature Section 1: Technical Requirements for Electrical Equipments;*

2) “The shell with light metal” is added to the shell material.

3) Electrical equipment is divided into two types of A and B: "tight dust" type and "dustproof" shell;

4) It increases heat cycle test of B-type equipments;

5) Explosion-proof sign is replaced to DIPA21 or DIPB20 etc., and Ex in the original sign, DT in "tight dust" sign and DP in "dustproof" sign are deleted.

This standard is implemented from on July 1, 2001.

This Standard will replace GB 12476.1-1990 from the implementation date

This Standard is proposed by State Administration of Machinery Industry.

This standard is under the jurisdiction of National Explosion-proof Electrical Equipment Standardization Technical Committee.

This Standard is drafted by: Nanyang Explosion-proof Electrical Research Institute,

Fushun Branch Institute of China Coal Science Research Institute, Jiamusi Explosion-proof Electrical Machine Research Institute, Zhengzhou Science Research and Design Institute of Ministry of Internal Trade, Nanyang Explosion-proof Group Co., Ltd.

The main drafters of this Standard are: Zhou Yuanchang, Chen Zaixue, Liu Yongqin, Qi Zhigao, Yan Chuanyu, and Xiang Yunlin.

This Standard was first issued on January 12, 1990, and first revised in October, 2000.

This Standard shall be explained by the National Explosion-proof Electrical Equipment Standardization Technical Committee

IEC FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.

3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.

4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61241-1-1 has been prepared by subcommittee 31H: Apparatus for use in the presence of combustible dust, of IEC technical committee 31: Electrical apparatus for explosive atmospheres.

This second edition cancels and replaces the first edition, published in 1993, and constitutes a technical revision.

The text of this standard is based on the following documents:

FDIS	Report on voting
31H/90/FDIS	31H/96/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

A bilingual version of this standard may be issued at a later date.

IEC 61241 consists of the following parts under the general title: Electrical apparatus for use in the presence of combustible dust:

- Part 1: Electrical apparatus protected by enclosures and surface temperature limitation
- Part 2: Test methods
- Part 3: Classification of areas where combustible dusts are or may be present
- Part 4: Type of protection pressurization "p"
- Part 5: Intrinsically safe apparatus[1)]

[1)] Under consideration.

INTRODUCTION

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

• by surfaces of the apparatus that are above the minimum ignition temperature of the dust concerned. The temperature at which a type of 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 (for example 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 kept below the temperature limitation specified in this standard;

• any electrical sparking parts, or parts having a temperatureabove the minimum 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 so as to avoid arcs, sparks or temperatures capable of igniting combustible dust;

• any other ignition sources are avoided.

The protection specified in this standard will not provide the required level of safety unless the electrical apparatus is operated within its rating and is installed and maintained according to the relevant codes of practice or requirements, for example in respect of

protection against over-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.

Two different types of practice, A and B, are specified in this standard. Both are intended to provide an equivalent level of protection.

Electrical apparatus for use in the presence of combustible dust—Part 1-1: Electrical apparatus protected by enclosures and surface temperature limitation—Specification for apparatus

GB 12476.2-2000

Idt IEC 61241-1-1: 1999

Replace GB 12476.1-1990

1 Scope

1.1 This standard is applicable to electrical apparatus protected by enclosures and surface temperature limitation for use in areas where combustible dust may be present in quantities which could lead to a fire or explosion hazard. It specifies requirements for design, construction and testing of electrical apparatus.

NOTE –This standard gives guidance on the selection, installation and maintenance of the apparatus. Apparatus within the scope of this standard may also be subject to additional requirements in other standards - for example, GB 3836.1.

1.2 Section 1 of this standard specifies the requirements for design, structural and test. Section 1.2 of this standard is electrical equipment selection installation and maintenance guideline.

1.3 The ignition protection is based on the limitation of the maximum surface temperature of the enclosure and other surfaces which could be in contact with dust and on the restriction of dust ingress into the enclosure by the use of "dust-tight" or "dust-protected" enclosures.

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

1.5 The application of electrical apparatus in atmospheres which may contain explosive

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