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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 12476.10-2010

**Electrical apparatus for use in the presence of combustible
dust -- Part 10: Test methods -- Method for determining
minimum ignition energy of dust/air mixtures**

可燃性粉尘环境用电气设备 第10部分：试验方法 粉尘与空气混合物最小点燃能
量的测定方法

(English Translation)

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Foreword

All technical content in this section is mandatory.

GB 12476 "combustible dust electrical equipment" is divided into several parts.

- Part 1. General requirements
 - Part 2. Selection and installation
 - Part 3. combustible dusts exist or may exist Classification of hazardous areas
 - Part 4. Intrinsic safety "iD"
 - Part 5. Housing protection type "tD"
 - Part 6. protective encapsulation "mD"
 - Part 7. protective positive pressure "pD"
 - Part 8. Test methods for determining the minimum ignition temperature of a dust
 - Part 9. Test method for determination of the dust layer resistivity
 - Part 10. Test methods for dust and air mixture Determination of minimum ignition energy
- this section is part GB 1,012,476, equivalent using IEC 61241-2-3:1994 "combustible dust Electrical apparatus Part 2. Test methods - Section 3. a mixture of dust and air minimum ignition energy measurement method "(in English).

This part of IEC 61241-2-3:1994 includes the following editorial changes.

--- Remove the IEC 61241-2-3:1994 Foreword;

--- Increase the national standard foreword.

This section of the Appendices A and B are informative appendices.

This part is proposed by the China Electrical Equipment Industrial Association.

This part of the National explosion-proof electrical equipment Standardization Technical Committee (SAC/TC9) centralized.

This part mainly drafted by. Explosion Protection Electric Institute.

This part of the main participants. National explosion-proof electrical products for Quality Supervision and Inspection Center, Fushun Branch Coal Research Institute, a positive Explosion-proof electrical Limited.

1 Scope

GB 12476 of the provisions of this part of the dust and air mixture is ignited by a high voltage direct current required minimum spark ignition energy measurement party law. This test method is intended to establish electrical discharge data for determining combustible dust and air mixture whether the ignition capability. Subjects Dust presents state (particle size, moisture content, etc.) should be representative of the actual use, in order to produce the actual dangers to be assessed. The party Determination of the ignition energy can be compared with other dust ignition energy, for assessing the electrical or electrostatic discharge caused by ignition of the respective risk to determine whether the electrical equipment suitable for installation in the presence of combustible dust in the workplace.

This test method is not applicable recognized Explosives, gunpowder, dynamite, oxygen-free combustion explosives, spontaneously combustible materials, or in certain conditions with or mixtures of these substances similar forms of substance. If you suspect an explosion characteristics of danger may be a small amount of dust above Placed on the heated surface of the apparatus described in GB 12476.8-2010 heated to 400 deg.] C to obtain indicators.

NOTE: should take some measures to protect the test personnel from fire and explosion hazards and/or burning effects, including toxic gas formed by combustion. Consistent with national Standard home does not exempt their share liability.

This section includes the relevant Appendix B Electrostatic Discharge minimum ignition energy efficient guidelines.

2 Normative references

The following documents contain provisions which, through reference in this Part of GB 12476, constitute provisions of this part. For dated reference documents Member, all

subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouraged to reach under this section Parties to research agreement to use the latest versions of these documents. For undated reference documents, the latest versions apply to this section.

GB/T 2900.77 Electrotechnical terminology for electric and electronic measurements and instrumentation - Part 1. General term measurements (GB/T 2900.77-2008, IEC 60050 (300-311).2001, IDT) GB/T 2900.79 Electrotechnical terminology for electric and electronic measurements and instrumentation - Part 3. Types of electrical measuring instruments (GB/T 2900.79, IEC 60050 (300-311).2001, IDT) GB/T 6919-1986 air quality vocabulary (eqvISO 4225. 1980) GB 12476.8-2010 combustible dust electrical equipment - Part 8. Determination of the minimum ignition temperature of dust Test Method Method (IEC 61241-2-1:1994, IDT)

3 Terms and Definitions

GB 12476 that this part of GB/T 2900.77, GB/T 2900.79 established in the following terms and definitions.

Dust dust

In the air can settle down on its own weight, but also sustainable solid fine particles suspended in the air for some time.

Note: GB/T 6919, the present definition includes "dust" and "grit." 3.2 Combustible dust After mixing with air can burn dust.

Note 1: combustible dust mixture only within a certain range of concentrations to burn.

Note 2: The external source of ignition of combustible dust can be ignited, continues to burn at ambient temperature, but they are only the minimum ignition temperature above its self-combustion.

Spark discharge Potential difference exists between the two conductors of electrical discharges moment. Spark is an ion across a gap between two conductors to a single electrical Form passage from discontinuous release.

The minimum ignition energy (combustible dust and air mixture) minimumignitionenergy (ofacombustibledust/air mixture) Capable of igniting the flammable mixture of air and dust, and it continued to burn spark (measured in accordance with this part of the program) the lowest energy.

Ignition

During the test, when the following conditions be considered when ignited.

--- Pressure rises above the sealed container (ie 20L spherical vessel) the pressure measured in the ignition sparks at least 20kPa; or

--- Flame tube from the open style (ie. Hartley Man tube Hartmantube) position sparks occur within the spread at least 6cm.

Ignition delay time Dust and spray times between the spark discharge occurs.

4.1 Spark generating circuit

Appendix A lists some suitable circuit form, all of these circuits should have the following characteristics. The following only relates to a circuit.

--- Discharge circuit inductance. 1mH ~ 2mH, when the data used to assess the risk of 25μH inductance not exceeding electrostatic discharge circuit when except;

--- Discharge circuit resistance (ohm). as low as possible, and not more than 5ohm;

--- Electrode material; stainless steel, brass, copper, or tungsten;

Electrode diameter and shape. 2.0mm ± 0.5mm. Use spherical electrode to reduce the impact on the corona electrode tip, pointed electricity can produce extremely erroneous spark energy value. If you use a pointed electrode, the corona impact should be carefully considered.

--- Electrode gap. 6mm (minimum);

--- Capacitance. low inductance and capacitance, resistance to inrush current;

--- Distribution electrode capacity. as low as possible;

--- Insulating material between the electrodes. sufficient to prevent leakage current.

Note: In general, the minimum resistance for 1mJ minimum ignition energy requirements between the electrodes is 1012ohm, 100mJ minimum ignition energy required minimum resistance to 1010ohm.

4.2 Test container

The test vessel is recommended for 20L spherical container or Hartley Man tube. These containers in Ref. [6] and [7] are described. as long as 6.2 meet the calibration requirements, other containers may also be used.

5 Test sample

The test shall be carried out on a sample equivalent to actual plant conditions established. The minimum ignition energy with decreasing particle size decreases. test in the test with the actual use shall particle size consistent or finer than the actual use, the sample or the finest material.

The ratio should be prepared for the test, the sample through a fixed method, the particle size and moisture content fixed.