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

GB 20800.3-2008

**General rules of explosion-protect techniques of reciprocating internal
combustion engines for explosive atmospheres -- Part 3: Group I engines for use
in underground workings susceptible to firedamp and/or combustible dust**

(English Translation)

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1 Scope

This part of GB 20800 specifies the safety requirements and (or) safety measures for Group I category M2 reciprocating compression ignition engines for use in underground workings with methane and/or combustible dust (hereinafter referred to as internal combustion engines), which are used to eliminate or limit various dangers and hazards that may occur on internal combustion engines.

This part applies to the explosion-proof structure design, manufacture and inspection of internal combustion engines 1).

This part does not apply to Group I category M1 internal combustion engines that require special conditions.

This part does not apply to internal combustion engines used in places where explosives are processed, manufactured, stored.

This part does not apply to ignition type internal combustion engines.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard;

however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable.

For undated references, the latest edition of the referenced document applies.

1 EN 1834-2:2000 has no specific requirements for inspection procedure. For the specific requirements of the inspection procedure, see Appendix A of GB 38336.1-2000.

GB/T 15706.2-1995 Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications (eqv ISO/TR

12100-2:1992, eqv EN 292-2:1991)

GB/T 16856-1997 Safety of machinery - Principles for risk assessment

GB 20800.1-2008 General rules of explosion-protect techniques of reciprocating internal combustion engines for explosive atmospheres - Part

1: Group II engines for use in flammable gas and vapor atmospheres (MOD

EN 1834-1:2000)

JB 8890-1999 Reciprocating internal combustion engines - Safety requirement

3 Terms and definitions

This part adopts the terms and definitions as proposed in GB/T 1883.1-2005,

GB 6809.1-1986, GB 6809.2-1988, GB 6809.3-1989, GB 6809.4-1989 as well as the following terms and definitions.

3.1

Explosive atmosphere

Under atmospheric conditions, the atmosphere wherein the mixture of combustible substances in the form of methane and/or combustible dust with air whose, after being ignited, combustion can spread to the entire unburned mixture.

3.2

Potentially explosive atmospheres

An explosive atmosphere that cause explosion due to the influence of site conditions and operating conditions.

3.3 Category

3.3.1

Engines of category M1 of group 1

The internal combustion engines for use in underground workings and mine above-ground operation areas where methane and/or combustible dust exist.

The explosion-proof measures of this kind of internal combustion engine can

When the internal combustion engine needs to install an intake air booster device, it shall select a booster device whose internal temperature and pressure cannot produce ignition conditions (see 4.4 and 4.9), meanwhile be equipped with air filter, to prevent foreign objects from entering the booster device.

Alternatively, the intake air booster device shall be part of the flameproof enclosure and be tested in accordance with the requirements of 5.3.

4.7.5 Reverse

Except for the internal combustion engine that can be reversed, the internal combustion engine shall be designed so that it cannot be reversed.

4.7.6 Fuel system

4.7.6.1

For the installation requirements of the fuel system, see 6.5.

4.7.6.2

The fuel tank shall be of metal structure, protected from corrosion, installed in a place free from mechanical damage.

The fuel tank shall pass a seal test with a pressure of at least 20 kPa.

4.7.6.3

The fuel filling port of the fuel tank shall be easily accessible; the structure and configuration shall be able to prevent fuel spillage or leakage. The metal cap of the fuel filler opening shall not be loose when it is covered and shall not be lost when it is opened.

4.7.6.4

The fuel tank shall be provided with vents, to keep the fuel tank under atmospheric pressure and not allow foreign objects to enter it.

4.7.6.5

The fuel tank shall be provided with an easy-to-control shut-off valve.

4.7.6.6

The fuel system shall be designed so that fuel will not flow out of the fuel tank in the event of failure of any fuel pipeline on the pumping side of the fuel pump.

4.7.6.7

The fuel pipeline shall:

- a) Designed as a metal pipe or hose with a metal mesh braid;
- b) Prevent internal and external chemical, thermal and mechanical damages;

- c) Lay in a place that can prevent mechanical damage;
- d) Be accessible.

4.7.6.8

The connection of the fuel pipeline shall be as short as possible; it shall minimize leakage during operation.

starting auxiliary devices uses the cylinder block of the internal combustion engine as the ground circuit during the operation of the starting auxiliary circuit, this is an exception; when starting auxiliary devices are not used, both the positive and negative connections shall be insulated from the cylinder block of the internal combustion engine.

For mobile internal combustion engines, if the power source is not together with the internal combustion engine and is installed in a place where the starter is only used in non-hazardous areas, the electric starter can also be of ordinary type.

4.12.1 Plastic materials

If there is no possibility of electrostatic discharge ignition, plastic materials can only be applied to external parts.

If any of the following measures are taken, it can prevent electrostatic discharge from ignition:

- The surface resistance shall not exceed 10⁹ ohm when measured in accordance with the provisions of 23.4.7.8 in GB 3836.1-2000;
- The electrostatic discharge surface area is limited to 100 cm²;
- The thickness of the non-conductive material on the conductive layer or the metal mesh shall not exceed 2 mm; when the metal mesh is used as the conductive layer, the mesh width shall not exceed 100 mm.

4.12.2 Potential balance

All externally accessible components shall be connected to the cylinder block of the internal combustion engine using conductors, to achieve potential balance. If these components are firmly installed and maintain metallic contact with the cylinder block, separate conductors are not necessary for connection.

4.13 Drive belt

The drive belt shall meet the requirements for resistance in GB 10715-1989.