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

MT/T 1041.1-2007

**Specification for adjustable speed electrical equipment of
shearer - Part 1: General specification
(English Translation)**

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1 Scope

This Part of MT/T 1041 stipulates the terms and definitions of the adjustable speed electrical equipment for the traction unit of shearer (hereinafter referred to as "adjustable speed electrical equipment"), and the general specification, i.e., all contents considered to be general requirements for all types of adjustable speed electrical equipment, as well as items with a wide range of meaning and common functional uses, e.g., explosion protection requirements, temperature rise, dielectric properties, speed-adjustable (load) characteristics, etc.

This Part applies to the following types of adjustable speed electrical equipment for the traction unit of shearer.

- a) speed-adjustable equipment by variable voltage variable frequency;
- b) speed-adjustable equipment by electromagnetism;
- c) switched reluctance drive.

2 Normative references

The provisions in the following documents become the provisions of this Part through reference in this Part of MT/T 1041. For dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Part. However, parties who reach an agreement based on this Part are encouraged to study if the latest editions of these documents are applicable.

For undated references, the latest editions apply to this Part.

GB/T 2423.4-1993 Basic environmental testing procedures for electric and electronic products -- Test Db. Damp heat, cyclic

GB 3836.1-2000 Electrical apparatus for explosive gas atmospheres -- Part

1. General requirements (eqv IEC 60079-0.1998)

GB 3836.2-2000 Electrical apparatus for explosive gas atmospheres -- Part

2. Flameproof enclosure "d" (eqv IEC 60079-1.1990)

GB 3836.3-2000 Electrical apparatus for explosive gas atmospheres -- Part

3. Increased safety "e" (eqv IEC 60079-7.1990)

4.2.1 The adjustable speed electrical equipment shall be able to function properly under the following environmental conditions.

a) Mounted on the shearer body (except for adjustable speed electrical equipment located at the face end).

b) The ambient temperature is not higher than +40°C and not lower than -5°C.

c) The altitude is not higher than 2 000 m.

NOTE: For adjustable speed electrical equipment used at an altitude of above 2 000 m, air cooling and dielectric strength degradation need to be considered. Adjustable speed electrical equipment for operation under the above conditions can be designed and used according to the agreement of the manufacturer and the user.

d) The relative humidity of the surrounding air is not more than 95% (at 25°C).

e) In a gas or vapor environment without damaging insulation.

f) Underground coal mining face with gas and explosive gas mixtures.

g) Environmental conditions for pollution class 3 (SEE 6.1.3.2 of GB/T 14048.1-2000).

h) Places where drip-proof measures are taken.

i) For the adjustable speed electrical equipment with water-cooled enclosure, the inlet temperature of the cooling water shall not exceed +30°C, and the inlet pressure of the cooling water shall not exceed 3MPa.

4.2.2 The overvoltage category (installation category) of adjustable speed

electrical equipment in the electrical system is Class E (SEE Annex H of GB/T 14048.1-2000).

4.3.1 Flameproof enclosure

4.3.1.1

The enclosure of adjustable speed electrical equipment shall be made of steel plates or

cast steel.

4.3.1.2 The enclosure flameproof joint of adjustable speed electrical

equipment shall comply with the provisions of Clause 5 of GB 3836.2-2000.

4.3.1.3 The flameproof properties of the enclosure of adjustable speed

electrical equipment shall comply with the provisions of GB 3836.2-2000, and shall withstand the enclosure pressure test specified in 15.1 and the non- explosion test of internal ignition specified in 15.2 of GB 3836.2-2000.

4.3.1.4 The enclosure of adjustable speed electrical equipment shall be subjected to static pressure test in accordance with the provisions of Clause 16 of GB 3836.2-2000 after finishing.

4.3.2 Cable entry device

equipment shall comply with the provisions of Clause 8 of GB 3836.2-2000.

Transparent parts shall be able to withstand the impact test specified in 23.4.3.1 of GB 3836.1-2000.

4.3.5 Grounding

The adjustable speed electrical equipment shall be provided with a grounding connection in the wiring cavity. The grounding connection shall comply with the provisions of Clause 15 of GB 3836.1-2000.

4.3.6 Interlocking

In order to maintain the flameproof adjustable speed electrical equipment, if an interlocking device is used, the interlocking device shall comply with the provisions of Clause 10 of GB 3836.1-2006.

4.3.7.1 The clearance in the wiring cavity of adjustable speed electrical

equipment shall comply with the provisions of GB 3836.3-2000. The clearance between different potentials is shown in Table 1.

4.3.7.2 The clearance between different potentials in the main cavity of

adjustable speed electrical equipment is shown in Table 2.

4.3.7.3 The creepage distance in the wiring cavity of adjustable speed

electrical equipment shall comply with the provisions of GB 3836.3-2000. The creepage distance between different potentials is shown in Table 1. The class of insulating materials selected for use in the wiring cavity shall not be lower than Class E. The classification of insulating materials can be found in 4.4.1 of

GB 3836.3-2000.

4.3.7.4 The creepage distance between different potentials in the main cavity

of adjustable speed electrical equipment is shown in Table 2.

4.3.7.5 The clearance and creepage distance of the intrinsically safe circuit of

adjustable speed electrical equipment shall comply with the provisions of 6.4 of

GB 3836.4-2000.

The speed-adjustable range and characteristics of adjustable speed electrical equipment shall comply with the requirements of Item 3 of Table 5 of MT/T 81-

1998. The conversion of the traction speed of shearer and the output shaft speed of speed-adjustable equipment, as well as the conversion of the tractive effort of shearer and the output torque of speed-adjustable equipment shall comply with the requirements of Annex D of MT/T 81-1998.

4.4.3.2 Speed change rate

The adjustable speed electrical equipment shall have a speed change rate of not greater than 2.5% at the rated torque (rated power) within the specified speed-adjustable range. The speed change rate is expressed in $\Delta n/n$.

Where.

n_{10} - Actual speed of any speed signal given by adjustable speed electrical equipment at the rated torque of 10% within the speed-adjustable range, in revolutions per minute (r/min);

n_e - Actual speed of adjustable speed electrical equipment when the output torque reaches the rated torque under the same given speed signal corresponding to n_{10} , in revolutions per minute (r/min);

n_{max} - Rated speed of adjustable speed electrical equipment when the rated torque is output, in revolutions per minute (r/min).