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

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**Accelerating agent of shotcrete used in coal mines
(English Translation)**

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Foreword

Bolt and shotcrete support is one of the main support methods for underground mining in China. Accelerating agent is an essential addition to ensure the effect of bolt and shot Agent, the formulation of this standard has a positive effect on ensuring the improvement of the quality of quick setting products.

With the development of science and technology, this standard added two parameters, alkalinity and shrinkage ratio, when it was formulated.

JC was referenced in the development of this standard 477-1992 `` Quick-setting agent for sprayed concrete " and absorbed production, scientific research, and use units experience of.

This standard is proposed by the Industry Management Department of the State Coal Industry Bureau.

This standard is under the jurisdiction of the Coal Industry Coal Mine Professional Equipment Standardization Technical Committee.

Drafting organizations of this standard. Beijing Institute of Well Research, China Coal Research Institute, Jiaozuo Mining Bureau Cement Plant Accelerator Branch, Jiangxi Pingxiang Mine Bureau Qingshan Building Material Factory, Shandong Xiangye Daily Chemical Co., Ltd. Accelerator Factory.

1 Scope

This standard specifies the definition, technical requirements, and determination of sprayed concrete accelerators (hereinafter referred to as accelerators) for underground and surface engineering of coal mines.

Methods, inspection rules, sampling, packaging and storage.

This standard applies to inorganic salt powder quick-setting agents for underground and ground sprayed concrete in coal mines.

2 Reference standards

The following standards contain provisions that, through reference in this standard, constitute provisions of this standard. When this standard was published, the editions shown were all is effective. All standards will be revised, and all parties using this standard should explore the possibility of using the latest versions of the following standards.

177-1985 Test method for strength of cement mortar GB 178-1987 standard sand for cement strength test GB 1345-1991 cement fineness test method (80 μ m sieve analysis method) GB 1346-1989 Test method for water consumption, setting time and safety of standard cement consistency GB 3350.4-1982 Compression fixture for cement physical inspection instrument GB 8076-1987 concrete admixture JC 313-1982 Expansion cement expansion method

3 Definition

This standard uses the following methods.

3.1 Accelerating

agent

An admixture that enables concrete (or mortar) to rapidly set and harden.

3.2 Reference cement mortar nominal

cement

mortar

In accordance with the test conditions specified in this standard, the standard curing cement mortar is formulated with reference cement and standard sand without any accelerator.

3.3 Tested cement mortar tested

cement

mortar

According to the test conditions specified in this standard, the standard curing cement mortar mixed with the accelerator and the standard cement formulated with the standard

cement and standard sand is used.

3.4 Ratio of compressive strength

compressive
strength

The ratio of the compressive strength of the tested cement mortar to the benchmark compressive strength of a certain curing age in accordance with this standard.

3.5 Shrinkage ratio

shrinkage
rate

The ratio of the shrinkage rate of the tested cement mortar to the shrinkage rate of the benchmark cement mortar in a curing age period in accordance with this standard.

4 Technical requirements

4.1

The parameters and performance indicators of the accelerator, the mixture with the accelerator and the hardened mortar shall be as specified in Table 1.

Table 1

Parameter	performance index	Setting time (min)	Initial setting	Final setting	Compressive strength ratio (%)	d >=105	d >=70	Fineness μm	sieve residue (%)	<=14	Water content (%)	<=2	Alkalinity (for ground)	pH<=13	d shrinkage ratio (%)	<=140

5 Test method

5.1

The test raw materials shall meet the following requirements

5.1.1

Reference cement.

Benchmark cement should meet GB 8076 regulations. When the benchmark cement cannot be obtained for any reason, C3A content of 6% ~ 8%, alkali content is allowed.

The amount (Na_2O 0.658 K_2O) of not more than 1% of clinker and dihydrate gypsum and slag milled is greater than (inclusive)

5.1.2

Standard sand.

Standard sand should meet GB Relevant provisions of 178.

5.1.3

Water.

Drinking water should be used.

5.2 Determination of setting time

5.2.1

Instruments and equipment.

Instruments and equipment should comply with GB Relevant provisions of 1346.

5.2.2

Environmental conditions shall meet the following requirements.

- a) Ambient temperature. the temperature of the test room, the temperature of various raw materials, the bottom mold of the coagulation time tester and the temperature of the test mold should be maintained at 20 ± 2 °C;
- b) Environmental relative humidity. 50% ~ 70%.

5.2.3

Determination steps.

- a) Standard test of the setting time tester and apply mold release agent or oil to the circular test mold and the glass bottom plate
- b) Wipe the mixing pot with a damp cloth and weigh the reference cement 400 g into a mixing pot;
- c) Weigh the accelerator 16 g or as recommended by the manufacturer but not more than 16 g accelerators are placed in the benchmark cement;
- d) Use a mixing shovel to dry mix the reference cement and the accelerator quickly, and pile them into a concave ring with a raised ring on the periphery;
- e) Measuring cylinder 160 mL of water, and gently pour the water into the dry material of cement and accelerator, start timing, use a mixing spatula at 25 s clock Mix well inside;
- f) Put the mixed cement paste into the test mold of the setting time tester, shake it several times on the platform, and ensure that the slurry fills the bottom of the test mold.

The scraper scrapes off the excess slurry and smoothes it, and places it on the base of the setting time tester;