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

MT/T 5015-1996

**Code for quality inspection of engineering supported by bolting
and shotcrete
(English Translation)**

Issued on: January 1, 1970

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Foreword

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The Quality Inspection Regulations for Anchor Shot Support Projects are based on the requirements of the Ministry of Coal Industry's Coal Regulation Letter (1994) No. 115, issued by Shandong Mining Prepared by the College in conjunction with the Luzhou Mining Bureau.

During the compilation process, the compilation team of "Quality Inspection Regulations for Anchor Shotcreting Support Engineering" conducted extensive investigation and research.

"Construction and acceptance specifications", "Technical specifications for anchor shotcrete support", "Concrete strength inspection and evaluation standards", "Quality of mine shaft engineering Inspection and Evaluation Standards and other relevant quality requirements for bolted shotcrete support engineering have drawn on mature scientific research results and new technologies in recent years, especially the research results of the "eighth five-year" key scientific and technological key project "anchor shotcrete support construction quality detection technology" as an important basis for the preparation of this procedure, widely the opinions of relevant units and experts were solicited, and trials were conducted. Finally, the Ministry of Coal Industry organized a review and finalization.

This regulation is divided into 6 chapters and 13 appendices. The point load method specified in the regulations measures the strength of sprayed concrete and the method of detecting the distance between bolts.

Methods for testing the quality of bolts and shotcrete support projects such as testing method, ultrasonic testing project section specifications, etc. are not available in other related domestic standards; dial-out test method for testing the strength of shotcrete, the Ministry of Railways and the Ministry of Metallurgy have corresponding industry standards. This method is adopted for the first time in the coal industry standards.

During the implementation of this procedure, all units hope to earnestly accumulate information and sum up experience. Where there is a need to modify or add, please comment and relevant the materials were sent to the Management Group of "Quality Inspection Regulations for Anchor Shot Support Engineering" of Shandong University of Mining and Technology for future reference.

February.1996

Notice on Issuing the "Quality Inspection Regulations for Anchor Shot Support Engineering"

Coal-based word [1996] No. 118 According to the requirements of the Coal Regulation Letter [1994] No. 115 issued by the Ministry of Coal Industry, the Ministry entrusted Sex industry standards, effective October 1, 1996.

This regulation is managed and explained by the Ministry of Coal Industry.

Ministry of Coal Industry of the People's Republic of China April 4, 1996

1 General

1.0.1

In order to standardize,, and scientificize the quality inspection technology for anchor rods and shotcrete (hereinafter referred to as anchor shotcrete) support engineering in coal mines, to ensure the quality of anchor and shotcrete support engineering in wells and lanes, this regulation is specifically formulated.

1.0.2

This regulation is applicable to the quality inspection of anchor and shotcrete support engineering in coal mine shafts. It is not applicable to prestressed anchor cable, steel fiber shotcrete, steel frame.

Support and reinforcement mesh quality inspection. Quality inspection of anchor and shotcrete support in underground mines, mine tunnels, traffic tunnels, hydraulic tunnels and various chambers Test can also refer to the use.

1.0.3

This code is mainly based on the national standards "Code for Construction and Acceptance of Mining and Tunnel Engineering", "Concrete Strength Inspection and Evaluation Standard", "Anchor Related specifications and standards such as the Technical Specifications for Pole Shotcrete Support and related industry standards such as the Standards for Quality Inspection and Evaluation of Coal Mine Tunnel Engineering, Prepared by specifications.

1.0.4

The material inspection and comprehensive evaluation of the engineering quality of the bolt and shotcrete support engineering of coal mine shafts shall be in accordance with the current the relevant provisions of the Evaluation Standards are implemented.

1.0.5

After the concrete at the detection site is damaged, it should be filled with mortar in time.

1.0.6

The quality inspection of anchor and shotcrete support engineering in coal mine shafts shall comply with the current national standards and the current industry standards in

addition to the provisions of this Regulation.

Relevant regulations.

2.1 General provisions

2.1.1

This chapter is applicable to concrete strength detection using shotcrete support in coal mine tunnel engineering.

2.1.2

The strength testing of shotcrete should adopt the point load test method or the pull-out test method, and the sprayed plate cutting method or chisel cutting method can also be used.

Do not use the test block method.

2.1.3

When using the point load test method or the pull-out test method to measure the strength of shotcrete, the layout of the test points should meet the following requirements.

- a) The concrete surface around the measuring point should be flat and avoid honeycombs and holes;
- b) There should be no reinforced or embedded iron in the concrete within 60mm around the measuring point;
- c) The distance between two adjacent measuring points should not be less than 250mm, and the distance from the edge of the concrete should not be less than 150mm;
- d) The thickness of the concrete at the test site should not be less than 50mm.

2.2 Point load test method

2.2.1

The point load test method is to use a concrete drill to drill a cylindrical core sample from the concrete spray body and use a point load meter to test its point load.

Load strength, and then determine the concrete strength detection method based on the point load strength.

2.2.2

The point load test method consists of two parts. sampling and point load test. The sampling section includes sampling rigs and diamond thin-wall drill bits, and with water cooling system. The point load test device includes a manual oil pump, a hollow oil cylinder, a loading cone, a pressure measuring device and an oil pipeline. Commonly used for equipment, see Appendix A of this regulation.

2.2.3

The point load test method for detecting the strength of shotcrete should meet the following requirements.

a) Sampling.

- 1) The machine should be placed smoothly during sampling to avoid impact and vibration;
- 2) The core sample should be complete, the diameter of the core sample should be greater than 1.5 times the diameter of the coarse aggregate of sprayed concrete, and the length of the core sample should not be less than 1.1 times.

b) Point load test.

- 1) The loading point should be located in the middle part of the core sample length, and the distance from either end should not be less than the core sample radius. The line connecting the two loading points should pass through the section circle.

Heart, that is, it must be loaded radially;

- 2) The location of the loading point should be the smooth and complete surface of the core sample, and avoid the re-spraying surface, rupture surface and air holes;
- 3) The core sample should be pressurized slowly and uniformly, and the loading speed should be less than 0.2MPa/s.

2.2.4

The point load test data obtained by one of the following situations must be discarded.

- a) The core sample is damaged along the multiple spray surface or the interface between the spray layer and the surrounding rock;
- b) the core-like fracture surface does not pass two loading points, or passes only one loading point;
- c) the angle between the core-like rupture surface and its axis is less than 45 °;
- d) There is a significant difference between the test data and the appearance characteristics of the core sample. Under normal circumstances, the appearance characteristics of the shot concrete core sample are related to the test data See Appendix B of this Regulation.

2.2.5

Load strength l of shotcrete core sample point, calculated according to formula (2.2.5).

(2.2.5)

Where L

P --- failure load (N);