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**Construction and Acceptance Specifications of Grouting  
Engineering at Working Face in Coal Mine Shaft and Roadway**

煤矿井巷工作面注浆工程施工与验收规范

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## Foreword

This document was issued on 2 April 2015 by the National Energy Administration of the PRC and takes effect on 1 September 2015.

It is a NB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

It is classified under ICS 73.020, Chinese classification P00/09.

This specification was prepared by the Zhongguo Meitan Jianshe Xiehui together with the relevant units in accordance with the Notice of the National Energy Administration on Issuing the First Batch of Energy Sector Industry Standard Formulation (Revision) Plans for 2012 (Guo Neng Ke Ji [2012] No. 83) and the requirements for drafting specifications. During drafting, the drafting group carried out extensive investigation, research and special studies, summarized the domestic construction experience of grouting engineering in coal mine shafts and roadways, widely solicited the opinions of relevant units and experts of the national coal industry in various forms and, after repeated study and revision, finalized this specification.

This specification consists of 6 chapters and 3 appendices. Its main contents include general provisions, terms, basic regulations, the acceptance procedure of grouting engineering at shaft and roadway working faces, the construction and acceptance of vertical shaft grouting engineering, and the construction and acceptance of grouting engineering in inclined shafts and roadways (adits).

This specification is under the administration of the National Energy Administration, its routine management is the responsibility of the Zhongguo Meitan Jianshe Xiehui, and the explanation of its technical contents is the responsibility of Henan Nengyuan Huagong Jianshe Jituan Co., Ltd. Comments and suggestions arising during implementation should be sent to Henan Nengyuan Huagong Jianshe Jituan Co., Ltd. (Building 1, Longcheng Plaza, Wenhua North Road, Huiji District, Zhengzhou, Henan Province; postcode 450000).

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## 1 Scope

NB/T 51030-2015 governs the construction and acceptance of pre-grouting from the working face in coal mine shafts and roadways. When a shaft is sunk or a roadway driven through water-bearing strata, the water has to be kept out before the ground is opened: holes are drilled ahead of the face, cement grout is injected under pressure to seal the

fissures, and only then does excavation proceed through the treated ground. Done badly, the face floods or the grout curtain leaks for the life of the mine. The specification sets the general provisions and defined terms, then the basic requirements on hydrogeological data, the grouting design and the qualification of the crew. It covers the grouting plug wall that seals the face and resists the grouting pressure, with the calculation of its thickness, and the arrangement of grout holes - number, direction, depth and spacing - for vertical shafts, inclined shafts and roadways. Grouting materials and mix design follow, with water-cement ratios and additives, then drilling, the water pressure test, grouting pressure and flow limits, sequencing and the criteria for ending a hole. The testing that proves the treated zone is sealed, the records to be kept, and the acceptance of the grouting works close the specification. It applies to coal mine construction in China.

1.0.1 This specification is formulated to strengthen the management of construction and acceptance of grouting engineering at working faces in coal mine shafts and roadways, to standardize the technical requirements for working face grouting design, construction and acceptance, and to ensure the construction quality and safety of coal mine shaft and roadway engineering.

1.0.2 This specification is applicable to the construction and acceptance of working face grouting engineering in coal mine vertical shafts, inclined shafts and roadways (adits).

1.0.3 The requirements for construction and acceptance of working face grouting engineering in coal mine shafts and roadways set out in the relevant contracts and engineering technical documents of coal mine shaft and roadway engineering shall not be lower than the provisions of this specification.

1.0.4 The construction of shaft and roadway engineering shall adhere to the water prevention and control principle of 'prediction and forecasting, exploration whenever in doubt, exploration before excavation, treatment before mining'.

1.0.5 Green construction shall be fully implemented in working face grouting engineering of coal mine shafts and roadways. Before the grouting engineering is carried out, an environmental protection plan for the construction shall be prepared, a sound environmental protection system shall be established, management responsibilities shall be defined, environmental factors shall be identified and evaluated, and management plans shall be prepared for significant environmental factors to achieve effective control.

1.0.6 In addition to complying with this specification, the construction and acceptance of working face grouting engineering in coal mine shafts and roadways shall also comply with the provisions of the current relevant national and industry standards.

## 2 Terms

2.0.1 Working face of underground mine roadway: the general term for heading faces, drilling and exploration faces, grouting faces and other working faces underground in all

kinds of mines.

2.0.2 Pre-grouting at mine working face: grouting operations carried out from the working face into the underground rock strata during shaft sinking and roadway driving.

2.0.3 Backfill grouting between shaft liners: grouting operations performed on the voids between two layers of shaft liner, where the shaft is supported by a double-layer liner, to prevent or seal water leakage through the shaft liner.

2.0.4 Post grouting: grouting operations performed on the voids within or behind the shaft and roadway walls and on the rock mass after the shaft and roadway have been excavated.

2.0.5 Backfill grouting: grouting operations performed on the outside of the shaft liner and on the fissures and pores of the surrounding rock.

2.0.6 Upward grouting: grouting operations in which the grouting hole is drilled to the design depth in one pass and grouting is then carried out layer by layer or section by section from the bottom upwards.

2.0.7 Downward grouting: grouting operations in which borehole drilling and grouting alternate layer by layer or section by section from the top downwards.

2.0.8 Height of grouting section: the grouting length of each section when the rock strata to be grouted are divided into several sections that are grouted in sequence.

2.0.9 Grouting cushion; grouting pad: a concrete structure constructed in advance above the aquifer during working face grouting of a vertical shaft, capable of withstanding the maximum grouting pressure and preventing grout leakage and grout escape towards the heading face.

2.0.10 Grouting rock plug: a rock pillar temporarily left above (in front of) the aquifer during working face pre-grouting of shafts and roadways, capable of withstanding the maximum grouting pressure and preventing grout leakage and grout escape towards the heading face.

2.0.11 Grouting plug wall: a structure constructed in advance in the section of a roadway to be grouted, capable of withstanding the maximum grouting pressure and preventing grout leakage and grout escape into the roadway.

2.0.12 Grouting pressure: the pressure required during grouting to overcome the flow resistance of the grout and to make the grout spread over a certain range.

2.0.13 Final grouting pressure; grouting terminal pressure: the pressure of the grout fed in at the grouting hole collar at the end of grouting.

2.0.14 Final grouting volume: the flow rate of the grout fed in at the grouting hole collar at the end of grouting.

2.0.15 Effective diffusion distance of grout: the effective distance, measured radially