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Evaluation of Coal Quality in Coal Resource Exploration

煤炭资源勘查煤质评价规范

(English Translation)

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1 Scope

This Standard specifies the requirements for evaluation of coal quality at various stages of the coal resource exploration.

This Standard is applicable to the design preparation, sampling test, coal quality research, and preparation of exploration report at various stages of the coal resource exploration.

2 Normative References

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) 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.

GB 5751 Chinese Classification of Coal

GB 6566 Limit for Radionuclides in Building Materials

GB/T 13908 General Requirements for Solid Mineral Exploration

GB/T 15224.1 Classification for Quality of Coal Part 1: Ash

GB/T 15224.2 Classification for Quality of Coal Part 2: Sulfur Content

GB/T 15224.3 Classification for Quality of Coal Part 3: Calorific Value

GB/T 16417 Method for Evaluating the Washability of Coal

GB/T 19224 Determining the Relative Degree of Oxidation in Bituminous Coal

GB/T 20104 Method for Identifying Tendency of Coal to Spontaneous Combustion by Oxygen Absorption with Chromatograph researching its process performance; evaluating their industrial use; proposing the coal processing and their utilization direction; so that provide data for the study of coal sedimentary environment, coal seam comparison and environmental protection. At each stage of the coal resource exploration, coal quality data of neighboring production mines shall be fully collected to provide basic data for the further development of coal quality work.

3.2 Coal quality work in the reconnaissance stage

Generally-understand the general characteristics of coal types and coal quality; study the original materials of coal, coal rock composition, as well as types of coal formation;

study the coal quality characteristics of each major coal seam, its changing law, and the changing rules of major harmful components in coal; preliminarily analyze the coal metamorphic factors. Sampling types, quantities, and test items can refer to Tables A.1 and A.2 in Appendix A.

3.3 Coal quality work in the prospecting stage

Roughly-determine the characteristics of coal types and coal quality in the mineable coal seam; study the original materials of coal, coal rock composition, as well as types of coal formation; study the coal quality characteristics of each major coal seam, its changing law, and the changing rules of major harmful components in coal; further analyze the metamorphic factors in each major coal seam. Sampling types, quantities, and test items can refer to Tables A.1 and A.2 in Appendix A.

3.4 Coal quality work in general exploration stage

Basically-identify the coal quality characteristics and process performance of the mineable coal seam; determine the coal types of the mineable coal seam; evaluate the industrial utilization direction of coal; preliminarily identify the weathering zone boundary of the major mineable coal seam; evaluate the degree of change of the coal quality of coal seam; comprehensively study the physical and chemical characteristics and changing law of each mineable coal seam; study the coal distribution law; make a preliminary evaluation of the comprehensive utilization direction of coal and its impact on the coal seam mining. The sampling types, quantities and test items can refer to

Tables A.1, A.2, and A.3 in Appendix A.

3.5 Coal quality work in detailed exploration stage

Find out in detail the characteristics of coal types and coal quality of mineable coal seam, and their changes within the pre-mined area. According to the requirements of development and construction, focus on studying the coal quality characteristics and process performance related to the mining, washing, processing, sales, environmental protection, utilization, etc. of the coal; and make corresponding evaluation. The sampling types, quantities, and test items can refer to Appendix A, and Tables A.1, A.2, and A.3.

4.2.2 The coal sample of coal core is generally taken as full-layer sample based on the independent coal seam. When the coal quality is significantly different and the layer thickness is greater than 0.5m, then take the stratified coal sample. When sampling from the coal seam with complex structures, it shall be taken separately according to the gangue and coal stratification.

4.2.3 The gangue larger than 0.01m to the minimum mineable thickness of coal seam shall be sampled separately. For the gangue greater than the minimum mineable thickness of coal seam, if it belongs to non-carbonaceous mudstones, it shall not be sampled; if it belongs to carbonaceous mudstones or soft rocks, it shall be sampled separately. The gangue with thickness less than or equal to 0.01m, it shall be sampled together with the connected coal layer rather than be removed. The gangue of multiple thin coal seam can be sampled separately, or combined with the same lithology to be sampled.

4.2.4 When the false top and false bottom of the coal seam are carbonaceous mudstones, full-layer samples shall be taken separately. If it belongs to the non- carbonaceous mudstone, the layer thickness is greater than 0.1m, take sample of 0.1m;

if the layer thickness is less than 0.1m, all shall be sampled.

4.2.5 The coal sample of coal core needs to be sampled according to different coal seams without shrinkage. When the coal seam thickness is large, it shall be sampled in sections. The section thickness is generally no greater than 3.0m; the interval of steeply inclined coal seams can be appropriately relaxed.

4.2.6 When taking out the coal core from the borehole to the end of the sampling, it shall not exceed 8h for lignite, not exceed 24h for bituminous coal, and not exceed 48h for anthracite. The mass of the coal sample of coal core shall be at least 1.5kg. If special items of test are required, the number of samples can be determined according to the test requirements.

4.3 Coal sample for testing washability

4.3.1

The coal sample for testing washability can be divided into two types including size and float-sink test coal sample (also known as production sample), and coal sample for testing

washability of coal core coal sample (also known as simple sample).

4.3.2

The size and float-sink test coal sample shall be taken in the production mines or exploration tunnels with a mass of no less than 10t. The sampling points shall be arranged below the oxidized zone and in areas with normal coal seam thickness, structure, and coal quality. Detailed geological records shall be made near the sampling points. The coal sample shall include the mined gangues and naturally mixed false top and false bottom vermiculite. Except where stratified sampling is required, full-layer sampling is generally adopted. When taking all the coal from the coal seam roof and floor in the sampling laneway, if the amount of mined coal is too large, it can of the sample groove; calculate its volume. Use the same method to calculate the volume of gangue (if the gangue shape is irregular, immerse it into the water to measure its volume) with thickness greater than 0.05m. Accurately measure the mass of all coal samples in the dry-air state; shrink a sample to determine the moisture, ash, true density and apparent density, etc. Two volume and mass coal samples with similar specifications shall be taken from the same sampling point; their measurement results difference shall be no greater than 0.05t/m³. If the above value is exceeded, take a third sample.

4.4.3 When taking full-moisture coal sample in the tunnel, select the fresh coal surfaces with no water dropping and normal temperature to take according to the requirements;

or use the size and float-sink coal sample and production coal sample to shrink by quarter method. Place the coal sample with particle size less than 13mm and mass no less than 2kg into ground-mouth sample bottle (the sample volume shall not exceed

3/4 of the volume of the coal sample bottle). The coal sample shrinkage, shipping into bottle must be finished as quickly as possible in the sampling location, then immediately sealed by the black tape, sealed by wax after transferring into the room.

Wipe the container surface, weigh it accurately (use a tray balance with sensitivity of 0.1g); label it properly; send it to the laboratory within 5d.

4.5 Coal sample of coal rock

4.5.1

For the coal sample of coal rock that reflects normal coal quality, its sampling points shall avoid the abnormal zones such as fracture zone, wind-oxidization zone, magmatite contact zone, spontaneous combustion metamorphic zone, etc. The coal sample of coal rock with special research purposes needs to be taken at specific location.

4.5.2

When sampling, the following contents shall be described in detail, such as coal seam structure of the sampling point, physical properties of coal, macro coal type, top and bottom