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Replacing GB/T 15458-1995

Determination of abrasion index of coal

煤的磨损指数测定方法

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Determination of abrasion index of coal

1 Scope

This standard specifies the method summary, terminology, equipment, determination procedure, result calculation, precision and test report for the determination of abrasion index of coal.

This standard applies to lignite, bituminous coal and anthracite.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) 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/T 211-1996 Determination of total moisture in coal (neq ISO 589:1981)

GB 474 Preparation of coal sample (GB 474-1996, eqv ISO 1988:1975)

GB 475 Sampling for commercial coal (GB 475-1996, eqv ISO 1988:1975)

GB/T 483 General rules for analytical and testing methods of coal

GB/T 700 Carbon structural steels

GB/T 6003 Test sieves

GB/T 19494.1 Mechanical sampling of coal - Part 1: Method for sampling (GB/T 19494.1-2004, ISO 13909-1:2001, NEQ)

GB/T 19494.2 Mechanical sampling of coal - Part 2: Method for sample preparation (GB/T 19494.2-2004, ISO 13909-1:2001, NEQ)

3 Terms and definitions

Abrasion index

Milligrams of metal abrasion per kilogram of coal under specified conditions.

5.1.1 Blade

There are two types of blades: reference blade and working blade.

5.1.1.1 Reference blade

A set of four blades, the size is 38 mm × 38 mm × 11 mm, the tolerance is ± 0.1 mm, as shown in Figure 2. The Vickers hardness is 160 ± 15. In order to reduce the change of blade's surface hardness, it shall minimize the surface deformation and heat generation during processing. The mass difference between the blades of the same set is not more than 1 g. The blade is made of 15# steel (GB/T 700 carbon structural steel). Blades shall be grouped and numbered, for example, the first group is numbered by 1.1, 1.2, 1.3, 1.4.

Each set of blades shall be pre-ground before the formal use, that is, the same coal sample shall be used each time (2 kg each time) to perform multiple determinations of abrasion index, until the difference between the two consecutive abrasion index values meets the repeatability limit (see Chapter 9).

After the blade is roughened due to frequent use, it shall be carefully polished by fine emery paper and pre-ground before use.

When the blades are not in use, they shall be wiped clean first; then wiped by a cloth soaked with antiseptic solution; stored in a desiccator. Before the blades are used, use solvents such as alcohol to wipe them clean and put them in a desiccator.

When any of the following conditions occur, the reference blade shall be invalidated or downgraded to a working blade:

a) The blade's leading edge or angle abrasion exceeds 3 mm;

b) The mass difference of blades in a group exceeds 1 g;

c) The total abrasion of a group of blades is greater than 2% of the initial total mass;

d) There are obvious scratches on the surface of the blade;

e) The blade cannot be reasonably adjusted in the tank to a clearance of (6.4 ± 0.1) mm from the tank wall and the bottom plate.

of revolutions can be accumulated; it stops automatically when reaching to (12000 ± 20) r.

5.1.6 Fixtures

The dimensions and structure are as shown in Figure 3. It is used to determine the installation position of the blade on the cross-shaped seat. The size of the fixture shall be such that when the blade is fixed on the cross-shaped arm, the blade can touch the wall and bottom of the fixture. When the cross-shaped seat and the blade assembly are moved into the tank, it can ensure that there is a clearance of (6.4 ± 0.1) mm between the blade and the tank wall and the bottom plate of the grinding tank.

5.2 Plug gauge

It is used to check the clearance between the blade and the tank wall and the bottom plate of the grinding tank.

5.3 Balance

The maximum weighing is 5 kg and the sensing mass is 10 g.

5.4 Analytical balance

The maximum weighing is 200 kg and the sensing mass is 0.1 g.

5.5 Jaw crusher

Can break coal samples to 9.5 mm below.

5.6 Test sieve

Round hole sieve which has a mesh size of 1.25 mm, 9.5 mm, 13 mm and conforms to GB/T 6003.

5.7 Divider

Meet the requirements of GB 474 and can reduce coal samples which have a particle size of less than 9.5 mm.

5.8 Fine copper wire brush

Used for cleaning blades.

6 Coal sample

6.1 According to the provisions of GB 474 or GB/T 19494.2, prepare a coal sample into a coal sample which has a particle size of less than 13 mm, from

which no less than 20 kg shall be divided. Make it air dry.

6.2 Crush the coal sample step by step until all it passes through the round hole sieve which has a mesh size of 9.5 mm. The composition of the coal sample which has a particle size of less than 1.25 mm does not exceed 30%.

6.3 Spread the coal sample into a thin layer and place it in the laboratory atmosphere, to make it air dry in laboratory. This is the coal sample to be tested.

7 Determination procedures

7.1 Check and thoroughly clean the grinding tank, the grinding tank's lid, the grinding tank's bottom plate, the cross-shaped seat. If necessary, it can be wiped by a suitable solvent such as alcohol and then placed in a desiccator to dry.

7.2 Remove the blade from the desiccator and accurately weigh it to 0.1 mg.

7.3 Fix the cross-shaped seat in the fixture. Use M6 semi-cylindrical head bolts, nuts and washers to fix the blade to the four arms of the cross-shaped seat (the round head of the bolt shall be on the same side as the blade). Adjust the blade so that its round end and bottom edge are in contact with the wall and bottom of the fixture. Tighten the nut. Install the cross-shaped seat with the blade installed on the drive shaft of the measuring instrument. Tighten the nut on the shaft.

7.4 Weigh two sets of (500 ± 0.5) g coal samples and determine the moisture according to the provisions of method D of GB/T 211-1996. The determination of the moisture content of coal samples shall be carried out simultaneously with the determination of the abrasion index.

7.5 Use a divider to divide the coal sample to be tested and weigh (2 ± 0.01) kg of coal sample. Put the tank on the boss. Place the coal sample into the tank and spread it flatly.

Note: Use a plug gauge to regularly check whether the clearance between the blade and the inner wall of the tank and the bottom plate of the grinding tank meets the requirements.

7.6 Set the counting controller to zero and start the analyzer. It automatically stops when it rotates to (12000 ± 20) r.

7.7 Open the lid. Take out the tank. Cool it and remove the coal powder. Remove the cross-shaped seat and blades from the drive shaft. Clean them and put them in the fixture to check the position of the blades. If the blades deviate from the original position, the test is invalid.

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