



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

GB/T 19494.2-2023

**Mechanical sampling of coal - Part 2: Method for sample
preparation**

Issued on: November 27, 2023

Implemented on: March 1, 2024

Issued by: SAMR; SAC

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1 Scope

This document specifies the precision of coal sample preparation, specimen composition, division, reduction, mixing and air-drying, as well as the preparation of various coal samples, coal sample for back-check and the design requirements for sample preparation equipment.

This document is applicable to lignite, bituminous coal and anthracite coal.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB/T 211 Determination of Total Moisture in Coal

GB/T 19494.1 Mechanical Sampling of Coal - Part 1.Method for Sampling

GB/T 19494.3 Mechanical Sampling of Coal - Part 3.Determination of Precision and Bias

Test

3 Terms and Definitions

What is defined in GB/T 19494.1, and the following terms and definitions are applicable to this document.

3.1 sample preparation

The process of bringing coal samples to analysis or testing status.

3.2 on-line sample preparation

Samples are prepared using equipment integrated into the sampling system.

3.3 off-line sample preparation

Use equipment that is not integrated with the mechanized sampling system to prepare coal samples taken by the mechanical sampling system by manual or mechanized methods.

3.4 sample division

The sample preparation process that divides a specimen into representative and discrete parts.

3.5 fixed mass division

A division method, in which, the mass of the retained specimen is fixed and has nothing to do with the mass of the specimen being divided.

3.6 fixed ratio division

A division method with a certain division ratio, that is, the retained specimen amount is in a certain proportion to the divided specimen amount.

4 Precision of Coal Sample Preparation

In accordance with the description in GB/T 19494.3, under continuous sampling, the precision estimated (absolute) value PL of the determination results of a batch of coal under a confidence probability of 95% is calculated in accordance with Formula (1).

5.1 Overview

A specimen is generally merged by many individual sub-samples, or all sub-samples of the entire sampling unit, or a part of sub-samples of a sampling unit. Under certain circumstances, such as particle size analysis and bias test, a sub-sample constitutes a

specimen.

Sub-sample merging procedures vary with the sampling mode---time-based sampling or mass-based sampling (see 5.2).

5.2.1 Time-based sampling

The mass of sub-samples of time-based sampling is proportional to the coal flow rate at the time of sampling. At this time, the specimen can be directly merged by primary sub-samples or merged by divided sub-samples prepared by the fixed ratio division method to a certain stage

5.2.2 Mass-based sampling

If the mass of the primary sub-samples is close to uniform (that is, the coefficient of variation of the sub-sample mass is less than 20%, and there is no correlation between the sub-sample mass and the coal flow rate, see GB/T 19494.1), then, the primary sub-samples can be merged into a specimen, or directly merged, or merged after the primary sub-samples are divided by the fixed ratio division method to a certain stage (see Chapter 6).

If the mass of the primary sub-samples is non-uniform, then, they shall be divided by the fixed mass division method to a certain mass, then, merged into a specimen.

5.3 Specimen Merging

During specimen merging, the mass of each specimen shall be proportional to the mass of each sampled coal, so that the quality parameter value of the merged specimen is the weighted average value of the quality parameter value of each merged specimen. The division of each specimen before merging shall adopt the fixed ratio division method (see Chapter 6).

6.1 Basic Requirements

Division is the most critical procedure in sample preparation, and its purpose is to reduce the amount of coal sample. The division of coal sample can be carried out online or offline using mechanical methods, or manually. Whenever the conditions permit, mechanical division shall be applied, so as to minimize human error.

6.2.1 Division and dividing machinery

Mechanical division can be performed on individual sub-samples or total specimens that have not been reduced, or on specimens that have been reduced to a certain particle size. Division can be carried out by the mode of fixed mass division or fixed ratio division, but it shall comply with the requirements specified in 6.2.3. Specifically speaking, the fixed ratio

division is relatively simple and easy to implement.

6.2.3 Cutting interval

In order to minimize the bias, when dividing, the first cutting shall be performed randomly within the first cutting interval. For the second and third dividers, the cutting cycle of the latter cutter shall not coincide with the cycle of the previous cutter.

6.2.4.1 Number of cuttings

The number of cuttings for one sub-sample.

- a) For fixed mass division, the minimum number of cuttings for primary sub-sample is 4, and the number of cuttings for each primary sub-sample of the same sampling unit shall be equal;
- b) For fixed ratio division, the minimum number of cuttings for primary sub-sample with an average mass is 4;
- c) When the divided primary sub-sample is further divided, each cut shall be cut again at least once.

The division and re-division procedures of a single sub-sample are shown in Figure 3.

- a) Stage 1 division of a single sub-sample

6.2.4.2 Minimum mass of divided sub-sample

The minimum mass of the divided sub-sample shall satisfy the following requirements. the mass of the total specimen merged by all the divided sub-samples in each division stage shall be greater than the mass under the corresponding sample purpose and the nominal maximum particle size specified in Table 1, and satisfy the requirements of Formula (2); if the sub-sample mass is too small to satisfy the two requirements, then, it shall be further reduced, then, divided.

Specimen division (at least 60 cuttings)

6.2.5.1 Number of cuttings

The minimum number of cuttings for the division of coal sample merged by all sub-samples or divided sub-samples is 60.

If the mass of the coal sample is too small, then, the manual methods shall be used for division.

6.2.5.2 Minimum mass of divided specimens

The minimum mass of the divided specimens (see Table 1) depends on the nominal