International Standard ISO 5069/1

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Brown coals and lignites — Principles of sampling — Part 1 : Sampling for determination of moisture content and for general analysis

Charbons bruns et lignites — Principes d'échantillonnage — Partie 1 : Échantillonnage pour la détermination de l'humidité et pour l'analyse générale

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 5069/1 was developed by Technical Committee ISO/TC 27, *Solid mineral fuels*, and was circulated to the member bodies in March 1982.

It has been approved by the member bodies of the following countries :

Australia	Egypt, Arab Rep. of	Romania
Austria	Germany, F. R.	Spain
Belgium	Hungary	Turkey
Canada	India	USSR
China	New Zealand	
Czechoslovakia	Poland	

The member body of the following country expressed disapproval of the document on technical grounds :

Japan

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Brown coals and lignites — Principles of sampling — Part 1 : Sampling for determination of moisture content and for general analysis

0 Introduction

This International Standard deals with aspects of the sampling of brown coals and lignites.

Part 1 presents the principles of methods for the sampling of brown coals and lignites from streams, wagons, barges and stock-piles which differ from those described in sampling of hard coals. Other general principles and the procedure of replicate sampling are the same as for hard coals.

Part 2 gives methods for the preparation of laboratory and analysis samples of brown coals and lignites for the determination of moisture content and general analysis.

NOTE — Attention is drawn to ISO 1213.

1 Scope and field of application

This part of ISO 5069 establishes the principles of the methods to be used for the sampling of brown coals and lignites (herein after called "coals") from streams, wagons, barges and stock-piles when the sample is to be used for the determination of moisture content and general analysis. These methods differ from those specified in ISO 1988.

2 References

ISO 1213, *Solid mineral fuels — Vocabulary*

Part 1 : Terms relating to coal preparation.[1)]

Part 2 : Terms relating to coal sampling and analysis.[2)]

ISO 1988, *Hard coal — Sampling.*

ISO 5068, *Brown coals and lignites — Determination of moisture — Indirect gravimetric method.*

ISO 5069/2, *Brown coals and lignites — Principles of sampling — Part 2 : Sample preparation for determination of moisture content and for general analysis.*

3 General principles

3.1 Types of gross samples

Usually one gross sample is taken, and is used for both moisture and general analysis (common sample). Under certain circumstances (for example visibly wet coal), it may be necessary to take a separate gross sample for the determination of moisture (special moisture sample). The types of samples are shown in figure 1 of ISO 5069/2.

3.2 General directives for collecting moisture samples

The sample destined for moisture determination should be stored in moisture-tight containers. Precautions shall be taken when handling to avoid loss of moisture.

3.3 Precision

In this International Standard all references to precision imply a 95 % probability level. Standards of precision are specified in table 1.

Table 1 — Standards of precision

Parameter	Value of parameter	Standard of precision
Ash (dry basis)	Up to 20 %	± One-tenth of true ash content
	More than 20 %	± 2 % absolute
Moisture (as received)	Up to 20 %	± One-tenth of true moisture content
	More than 20 %	± 2 % absolute

1) At present at the stage of draft. (Revision of ISO/R 1213/1.)

2) At present at the stage of draft. (Revision of ISO/R 1213/2.)

3.4 Minimum mass and minimum number of increments

3.4.1 Minimum mass of increment

The minimum mass of increment P is determined, in kilograms, from the empirical formula

$$P = 0{,}06\,D$$

where D is the nominal top size limit, in millimetres, except that P should never be less than

a) 0,5 kg for coals up to 12,5 mm top size, and

b) 10 kg for coals over 150 mm top size.

3.4.2 Minimum number of increments

The minimum number of increments of a consignment of up to 2 500 t is given in table 2. Numbers given in table 2 refer to raw coals. For cleaned coals, the number of increments divided by 2 shall be used.

For consignments over 2 500 t, alternative procedures are permitted :

a) the total consignment shall be divided into a number of portions, each of 2 500 t or less, from each of which a separate sample consisting of the specified number of increments shall be taken;

b) one gross sample only may be taken, but the minimum number of increments for the particular case shall be multiplied by the following empirical factor :

$$\sqrt{\frac{\text{consignment mass (in tonnes)}}{2\,500}}$$

Table 2 — Minimum number of increments

Sampling from	For special moisture sample	For common sample
Conveyors and streams	16	32
Wagons and barges	16	48
Stock-piles	16	64

4 General directives for sampling

4.1 Sampling from streams of coal

4.1.1 General principles

It is recommended that power-operated equipment for the collection of samples be used when available. Hand sampling may be used only in cases when the particle size of the coal is below 80 mm, provided that agreement between the interested parties is reached. The increments shall be collected at regular intervals of time when there is a normal load on the belt at the point of sampling.

4.1.2 Technological requirements

4.1.2.1 Increments shall be collected at regular intervals. These shall be determined from the minimum number of increments required for the given tonnage and belt speed.

4.1.2.2 It is essential that the sampler does not cause systematic errors whilst the increments are collected.

4.1.2.3 The capacity of the sampling equipment shall be such that during the collection of each increment it is not filled more than three-quarters full, preventing, at the same time, the scattering of any particles.

4.1.2.4 It is essential that the sampler should not alter the characteristics of the samples, e.g. by reducing the moisture content, pushing particles aside or crushing larger pieces.

4.1.2.5 When the increments have been collected, the sampling equipment shall be completely emptied in the end position of its travel. An exception to this rule is a flaptype sampler, provided that its collector section is the proper part of the transport track (for example the chute).

4.1.2.6 The basic functional parts of the machines, namely the width of the collector slot, the length of the sampling equipment travel, the running speed, and others shall be adjustable.

4.1.3 Machinery requirements

4.1.3.1 The sampling equipment shall cut the width and length of the conveyed coal without omitting any part of it. In the case of stationary sampling, the sampling equipment shall cut through the total height of the loaded coal.

4.1.3.2 The increments shall be collected from the cross-section of the coal stream either in one pass or, alternatively, from both halves of the stream.

4.1.3.3 The speed of the sample cutter shall be uniform whilst it traverses the stream.

4.1.3.4 The width of the sampling equipment slot shall be at least 2,5 times the upper limit of the particle size of the coal being sampled. The minimum width shall be not less than 50 mm.

4.1.3.5 The sampler cutter shall be approximately 20 cm longer than the width of the coal stream.

4.1.3.6 The electrical control equipment of the sampler shall be capable of varying the time-interval of increment collection and of manual operation.

4.1.4 Safety conditions

4.1.4.1 The starting and stopping of the belt and minor faults in the mechanical and electrical systems of the equipment shall be indicated to the operator by visual (e.g. coloured lights) or sound signals.