INTERNATIONAL STANDARD

ISO 18283

Second edition
2022-03

Coal and coke — Manual sampling

Houille et coke — Échantillonnage manuel

Reference number
ISO 18283:2022(E)

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Published in Switzerland

Contents

Page

Foreword ..... **v**
Introduction ..... **vii**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Establishing a sampling scheme **4**
4.1 General 4
4.1.1 Sampling 4
4.1.2 Sampling scheme 5
4.1.3 Parameters 5
4.1.4 Sampling methods 5
4.2 Design of the sampling scheme 6
4.2.1 General 6
4.2.2 Coal or coke to be sampled and considerations for sampling 6
4.2.3 Division of lots 6
4.2.4 Precision of results 7
4.2.5 Bias of results 7
4.2.6 Requirements for test samples 7
4.3 Precision of sampling 8
4.3.1 General 8
4.3.2 Precision and total variance 8
4.3.3 Primary increment variance 9
4.3.4 Sub-lot variance 10
4.3.5 Preparation and testing variance 10
4.3.6 Number of sub-lots and number of increments per sub-lot 11
4.3.7 Minimum mass of samples for general analysis and determination of total moisture content 12
4.4 Checking the overall precision for the lot by calculation and selection of sampling scheme 15
4.5 Determination of acquired precision by replicate sampling 15
4.5.1 General 15
4.5.2 Method and calculation 15
4.5.3 Precision obtained using normal sampling scheme 16
4.6 Size analysis 16
5 Methods of sampling **17**
5.1 General 17
5.2 Sampling by time interval (time-basis sampling) 17
5.3 Sampling by mass interval (mass-basis sampling) 18
5.4 Stratified random sampling 18
5.4.1 General 18
5.4.2 Stratified random sampling by time interval 18
5.4.3 Stratified random sampling by mass interval 18
5.5 Extracting the increment 18
5.6 Coal or coke in motion 19
5.6.1 General 19
5.6.2 Stopped belt 19
5.6.3 Falling stream 20
5.6.4 Moving belt 20
5.6.5 Stockpiles (building/reclaiming) 21
5.6.6 Grabs/front-end loaders 21
5.6.7 Barges/trucks/railcars/wagons (loading/unloading) 22
5.7 Moisture/common sample 22

5.8 Different coals or cokes 23
5.9 Random selection of increments 23

6 Sampling equipment 24
6.1 General 24
6.2 Examples 25
6.2.1 Ladles 25
6.2.2 Shovels 25
6.2.3 Scoops 25
6.2.4 Probes 25
6.2.5 Manual cutter 26
6.2.6 Stopped-belt sampling frame 26

7 Handling and storage of samples 28
7.1 Sample size 28
7.2 Time 28
7.3 Divided sample 29
7.4 Containers 29
7.5 Moisture loss/breakage or degradation 30
7.6 Identification/labelling 31

8 Sample preparation 31
8.1 General 31
8.2 Constitution of a sample 31
8.3 Division 32
8.3.1 General 32
8.3.2 Mechanical methods 33
8.3.3 Manual methods 36
8.4 Reduction 40
8.4.1 General 40
8.4.2 Reduction mills 40
8.5 Mixing 41
8.6 Air-drying of coal 41
8.7 Coal — Preparation of test samples 42
8.7.1 Types of test samples 42
8.7.2 Preparation of samples for determination of total moisture content 42
8.7.3 Preparation of samples for general analysis 43
8.7.4 Common samples 45
8.7.5 Preparation of size-analysis sample 47
8.7.6 Preparation of samples for other tests 48
8.7.7 Reserve sample 49
8.8 Coke — Preparation of test samples 49
8.8.1 Types of test samples 49
8.8.2 Preparation of coke samples for determination of total moisture content 50
8.8.3 Preparation of samples for general analysis 52
8.8.4 Storage 53
8.8.5 Physical test sample 53
8.8.6 Samples for special properties 53
8.8.7 Reserve sample 53

9 Packing and marking of samples 53

10 Sampling report 54

Annex A (informative) **Example of calculation of precision, mass of increments,number of sub-lots and number of increments per sub-lot 55**

Annex B (informative) **Methods of sampling coal and coke from stationary lots 58**

Bibliography 60

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 27, *Coal and Coke*, Subcommittee SC 4, *Sampling*.

This second edition cancels and replaces the first edition (ISO 18283:2006), which has been technically revised. It also incorporates the Technical Corrigendum ISO 18283:2006/Cor.1:2006.

The main changes are as follows:

— Removal of any reference to intermittent sampling. Only continuous sampling is permitted.

— Discussion of the need to eliminate bias prior to discussing precision.

— Deletion of the separate tables on calculated numbers of increments.

— Deletion of the table on reference increment mass.

— Separation of tables for minimum sample masses for coal and coke.

— Removal of the table for reduced minimum sample mass for large sizes of coal and coke.

— Inclusion of manual sampling from a moving conveyor, provided a risk assessment is conducted at the outset and that this type of sampling is only permitted on a slow-moving belt or at low flow rates. Furthermore, at higher flow rates, mechanical assistance is necessary to ensure that primary increments can be collected safely.

— Restriction of the type of probes that can be used.

— Deletion of augers for manual sampling.

— Inclusion of a photograph of a gated riffle.

— Exclusion of sampling of large fuels in excess of the nominal top sizes in Tables 1, 2 and 4, because it is not practical.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Mechanical sampling from moving streams is the preferred method for sampling coal and coke. However, often mechanical facilities are not available. Moreover, for sized coal or coke, mechanical sampling may be a problem because of (size) degradation by the sampling system.

The fundamental requirements of sampling are that all particles of the coal or coke in the lot are accessible to the sampling instrument and thus have a non-zero chance of being selected, and that each individual particle of equal mass has an equal probability of being selected and included in the sample.

When sampling manually, conditions are often far from ideal. The methods described in this document are intended to obtain the most representative sample that can be safely achieved. Manual sampling should only be applied if no possibility for mechanical sampling exists.

The purpose of taking and preparing a sample of coal or coke is to provide a test sample that, when analysed, provides test results representative of the lot or sub-lot sampled.

The first stage of sampling, known as primary sampling, is the taking from positions distributed over the entire lot of an adequate number of coal or coke portions known as primary increments. The primary increments are then combined into a sample. From this sample, the required number and types of test samples are prepared by a series of processes jointly known as sample preparation.

In devising a sampling procedure, it is also essential to guard against bias in the taking of increments. Bias can arise from:

a) incorrect location/timing of increments,

b) incorrect delimitation and extraction of increments,

c) particle size segregation at the point of sampling,

d) loss of integrity of increments after extraction.

Methods for measuring bias are described in ISO 13909-8.

Coal and coke — Manual sampling

WARNING — This document can involve hazardous materials, operations and equipment, and does not purport to address all the safety issues associated with its use. It is the responsibility of the user of this document to establish appropriate health and safety practices.

1 Scope

This document provides the basic terms used in manual sampling of coal and coke and describes the general principles of sampling. It provides procedures and requirements for establishing a manual sampling scheme, methods of manual sampling, sampling equipment, handling and storage of samples, sample preparation and a sampling report, and applies to manual sampling during the transfer of coal or coke. Guidelines for manual sampling in stationary situations are given in Annex B, but this method of sampling does not provide a representative test sample and the sampling report shall state this.

This document covers sampling of brown coals and lignites, but does not include sampling from coal seams, for which guidance is given in ISO 14180. Mechanical sampling of coal and coke is covered in ISO 13909.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 579, *Coke — Determination of total moisture*

ISO 589, *Hard coal — Determination of total moisture*

ISO 687, *Solid mineral fuels — Coke — Determination of moisture in the general analysis test sample*

ISO 13909-8, *Hard coal and coke — Mechanical sampling — Part 8: Methods of testing for bias*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
air-drying
process of bringing the moisture content of the sample near to equilibrium with the atmosphere in the area in which further reduction and division of the sample are to take place

Note 1 to entry: Air-drying to equilibrium with the atmosphere applies to coal. Drying of coke is generally to facilitate sample preparation.

3.2
bias
systematic error that leads to the average value of a series of results being persistently higher or persistently lower than those that are obtained using a reference sampling method