International Standard

ISO 13909-7

Third edition
2025-07

Coal and coke — Mechanical sampling —

Part 7: Methods for determining the precision of sampling, sample preparation and testing

Charbon et coke — Échantillonnage mécanique —

Partie 7: Méthodes pour la détermination de la fidélité de l'échantillonnage, de la préparation de l'échantillon et de l'essai

Reference number
ISO 13909-7:2025(en)

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

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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 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 document 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 third edition cancels and replaces the second edition (ISO 13909-7:2016), which has been technically revised.

The main changes are as follows:

— references have been updated;

— the results discussed in Clause B.4 have been clarified.

A list of all parts in the ISO 13909 series can be found on the ISO website.

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.

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Introduction

Two different situations are considered when a measure of precision is required. In the first, an estimate is made of the precision that can be expected from an existing sampling scheme and, if this is different from that desired, adjustments are made to correct it. In the second, the precision that is achieved on a particular lot is estimated from the experimental results actually obtained using a specifically designed sampling scheme.

The formulae developed in this document are based on the assumption that the quality of the fuel varies in a random manner throughout the mass being sampled and that the observations will follow a normal distribution. Neither of these assumptions are strictly correct. Although the assumption that observations will follow a normal distribution is not strictly correct for some fuel parameters, this deviation from assumed conditions will not materially affect the validity of the formulae developed for precision checking since the statistics used are not very sensitive to non-normality. Strictly speaking, however, confidence limits will not always be symmetrically distributed about the mean. For most practical uses of precision, however, the errors are not significant.

In this document, the term “fuel” is used where the method is applicable to both coal and coke and either “coal” or “coke” where the method is exclusively applicable to that commodity.

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Coal and coke — Mechanical sampling —

Part 7: Methods for determining the precision of sampling, sample preparation and testing

1 Scope

This document defines methods for estimating overall precision and for deriving values for primary increment variance which can be used to modify the sampling scheme to change the precision. Methods for checking the variance of sample preparation and testing are also described.

In this document, formulae are developed which link the variables that contribute to overall sampling precision.

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 13909-1, *Coal and coke — Mechanical sampling — Part 1: General introduction*

ISO 13909-2:2025, *Coal and coke — Mechanical sampling — Part 2: Sampling of coal from moving streams*

ISO 13909-3, *Coal and coke — Mechanical sampling — Part 3: Sampling of coal from stationary lots*

ISO 13909-4, *Coal and coke — Mechanical sampling — Part 4: Preparation of test samples of coal*

ISO 13909-5, *Coal and coke — Mechanical sampling — Part 5: Sampling of coke from moving streams*

ISO 13909-6, *Coal and coke — Mechanical sampling — Part 6: Preparation of test samples of coke*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13909-1 apply.

ISO and IEC maintain terminology 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/

4 General

When designing a sampling scheme in order to meet a required precision of results, formulae that link certain fuel and sampling characteristics to that precision are necessary. The main factors to be considered are the variability of primary increments, preparation and testing errors, the number of increments and samples taken to represent the lot, and the mass of the samples. These formulae are derived in Clause 5. Methods for estimating the parameters used in those formulae are given in Clause 6.

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