
**Hard coal — Determination of
plastometric indices — Automated
Sapozhnikov penetration plastometer
method**

*Houille — Détermination des indices plastométriques — Méthode
automatisée du plastomètre à pénétration Sapozhnikov*



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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 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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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 5, *Methods of analysis*.

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

Historically the determination of plastic layer indices has been performed by manual operation. Firstly, the thickness of the plastic layer is detected with a probe by hand, then curves of the upper and lower layer are manually established and the results calculated. This process is labour intensive and required technicians with vast experience.

In recent years, the automated type of determinator was developed to measure the plastic layer indices. Displacement curves are auto-established by computer. The intelligent manipulator automatically measures the thickness of plastic layer and establishes curves of upper and lower plastic layer. The result is reported by the system automatically.

The objective of this document is to provide an alternative method for determining the plastic layer indices with automated Sapozhnikov penetration plastometer.

Hard coal — Determination of plastometric indices — Automated Sapozhnikov penetration plastometer method

1 Scope

This document specifies a method for the determination of plastometric indices with an automated Sapozhnikov penetration plastometer. These indices are the maximum thickness of the plastic layer, Y , in mm, and the final contraction, X , in mm.

This document is applicable to hard coals with a determined ash level of less than 15 % as dry basis as described in ISO 11722 and ISO 1171.

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 1213-2, *Solid mineral fuels — Vocabulary — Part 2: Terms relating to sampling, testing and analysis*

ISO 3310-2, *Test sieves — Technical requirements and testing — Part 2: Test sieves of perforated metal plate*

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

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

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

ISO 18283, *Coal and coke — Manual sampling*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1213-2 and the following 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/>

3.1

maximum thickness of plastic layer

Y

maximum perpendicular thickness between the upper and lower plastic layer

3.2

final contraction value

plastometric shrinkage

X

distance between the height of the coal sample at the temperature of 250 °C (the zero line) and at 730 °C