

TAHKED MINERAALSED KÜTUSED
Üldväävli määramine
Eschka meetod

Solid mineral fuels
Determination of total sulfur
Eschka method
(ISO 334:2013, modified)

EESTI STANDARDI EESSÕNA**NATIONAL FOREWORD**

See Eesti standard EVS-ISO 334:2019 „Tahked mineraalsed kütused. Üldväävli määramine. Eschka meetod“ sisaldab rahvusvahelise standardi ISO 334:2013 „Solid mineral fuels. Determination of total sulfur. Eschka method“ modifitseeritud ingliskeelset teksti.	This Estonian Standard EVS-ISO 334:2019 consists of the modified English text of the International Standard ISO 334:2013 „Solid mineral fuels. Determination of total sulfur. Eschka method“.
Ettepaneku rahvusvahelise standardi ümbertrüki meetodil ülevõtuks on esitanud EVS/TK 57, standardi avaldamist on korraldanud Eesti Standardikeskus.	Proposal to adopt the International Standard by reprint method has been presented by EVS/TK 57, the Estonian Standard has been published by the Estonian Centre for Standardisation.
Standard EVS-ISO 334:2019 on jõustunud sellekohase teate avaldamisega EVS Teataja 2019. aasta märtsikuu numbris.	Standard EVS-ISO 334:2019 has been endorsed with a notification published in the March 2019 issue of the official bulletin of the Estonian Centre for Standardisation.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available at the Estonian Centre for Standardisation.

Käsitlusala

See rahvusvaheline standard käsitleb üldväävli määramist kivisöes, pruunsöes, ligniidis **[MOD]**, põlevkivis ja poolkoksis ning nende termilise töötlemise ja põletamise tahketes jääkides **[MOD]**, kasutades Eschka meetodit.

Selles standardis on tehtud järgmised muudatused:

Sellesse standardisse on sisse viidud täiendused, mis võimaldavad standardi alusel määrata üldväävli sisaldust põlevkivis ja poolkoksis, kasutades Eschka meetodit. Täiendused, mille algus ja lõpp on tähistatud märgisega **[MOD]** on sisse viidud järgmistesse jaotistesse:

- Foreword;
- Introduction;
- peatükk 1;
- peatükk 2;
- peatükk 3;
- jaotised 4.2 ja 4.5;
- peatükk 6;
- jaotised 7.1.1, 7.3.1, 7.4, 7.5, 7.6 ja 7.7;
- Bibliography.

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ICS 73.040; 75.160.10

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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. www.iso.org/directives

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The committee responsible for this document is ISO/TC 27, *Solid mineral fuels*, Subcommittee SC 5, *Methods of analysis*.

This third edition cancels and replaces the second edition (ISO 334:1992), of which it constitutes a minor revision.

[MOD] In Estonian modifications to this standard, the scope of the standard has been extended to oil shale and its thermal processing products, taking into account the specific properties of oil shale and its thermal processing products. According to these differences, an alternative extraction method with water (7.5.2.a) was added. Additionally, some insignificant specifications have been added to the conditions of analyses performing. **[MOD]**

Introduction

An alternative reference method to that specified in this International Standard is given in ISO 351:1996.

Instrumental methods for a more rapid determination of total sulfur are now available. If such a method is to be used, it is important to demonstrate that the method is free from bias, when compared to this reference method, and will give levels of repeatability and reproducibility which are the same as, or better than, those quoted for the reference method (see Clause 9).

[MOD] Estonian modifications are based on GOST 8606:2015, because this standard includes directly the determination of total sulfur of oil shale and its thermal processing products. The Estonian standard EVS 668:2018 is used to describe the preparation of oil shale samples. **[MOD]**

1 Scope

This International Standard specifies a reference method for determining the total sulfur content of hard coal, brown coals and lignites, and coke [MOD], and oil shale, and solid residues of their thermal processing and combustion [MOD], by the Eschka method.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 1170, Coal and coke — Calculation of analyses to different bases

ISO 5068-1, Brown coals and lignites — Determination of moisture content — Part 1: Indirect gravimetric method for total moisture

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

ISO 11722, Solid mineral fuels — Hard coal — Determination of moisture in the general analysis test sample by drying in nitrogen

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

[MOD] EVS 668:2018, Oil shale — Determination of moisture [MOD]

3 Principle

A test portion is ignited in intimate contact with the Eschka mixture in an oxidizing atmosphere at 800 °C to remove combustible matter and to convert the sulfur to sulfate. This is then extracted with hydrochloric acid solution [MOD] or water [MOD] and determined gravimetrically by precipitation with barium chloride

4 Reagents

WARNING — Care should be exercised when handling the reagents, many of which are toxic and corrosive.

During the analysis, unless otherwise stated, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

4.1 Eschka mixture

Mix two parts by mass of light calcined magnesium oxide with one part by mass of anhydrous sodium (or potassium) carbonate. The mixture shall entirely pass a test sieve of 212 µm nominal size of openings.