



SLOVENSKI STANDARD
SIST ISO 5071-1:1998
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Brown coals and lignites -- Determination of the volatile matter in the analysis sample --
Part 1: Two-furnace method

iTeh STANDARD PREVIEW

Charbons bruns et lignites -- Détermination des matières volatiles dans l'échantillon pour
analyse -- Partie 1: Méthode avec utilisation de deux fours

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Ta slovenski standard je istoveten z: **ISO 5071-1:1997**

ICS:

73.040 Premogi Coals

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INTERNATIONAL STANDARD

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First edition
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Brown coals and lignites — Determination of the volatile matter in the analysis sample —

Part 1: Two-furnace method

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Reference number
ISO 5071-1:1997(E)

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 5071-1 was prepared by Technical Committee ISO/TC 27, *Solid mineral fuels*, Subcommittee SC 5, *Methods of analysis*.

ISO 5071 consists of the following part, under the general title *Brown coals and lignites — Determination of volatile matter in the analysis sample*:

— Part 1: *Two-furnace method*

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Introduction

The volatile matter is determined as the loss in mass, corrected for moisture, when an analysis sample of brown coal or lignite is heated out of contact with air under specified conditions. The test is empirical and, in order to obtain reproducible results, it is essential that the rate of heating, the final temperature and the overall duration of the test be carefully controlled. Due to the nature of brown coals and lignites, initial heating of the sample at 400 °C is necessary to minimize the possibility of ejection of sample from the test crucible.

Mineral matter associated with the sample may also lose mass under the conditions of the test, the magnitude of the loss being dependent on both the nature and the quantity of the minerals present.

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Brown coals and lignites — Determination of the volatile matter in the analysis sample —

Part 1: Two-furnace method

1 Scope

This part of ISO 5071 specifies a method of determining the volatile matter of brown coals and lignites.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 5071. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 5071 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1170:1977, *Coal and coke — Calculation of analyses to different bases — Vocabulary.*

ISO 1213-2:1992, *Solid mineral fuels — Part 2: Terms relating to coal sampling and analysis.*

ISO 5068:1983, *Brown coals and lignites — Determination of moisture content — Indirect gravimetric method.*

ISO 5069-2:1983, *Brown coals and lignites — Principles of sampling — Part 2: Sample preparation for determination of moisture content and for general analysis.*

3 Definitions

For the purposes of this part of ISO 5071, the definitions given in ISO 1213-2 apply.

4 Principle

The coal is heated out of contact with air for 7 min at 400 °C, then immediately transferred to another furnace and heated at 900 °C for a further 7 min. The percentage of volatile matter is calculated from the loss in mass of the oven-dried sample or from the loss in mass of the analysis sample corrected for moisture.

5 Reagents

5.1 Desiccants, fresh or freshly regenerated and preferably self-indicating. Suitable desiccants are magnesium perchlorate, silica gel, activated alumina and anhydrous calcium sulfate.

WARNING — Magnesium perchlorate is a strong oxidizing agent. Do not attempt to regenerate the absorbent. Do not permit contact with organic materials or reducing agent.

5.2 Nitrogen, dry, with a maximum oxygen content of 30 μm per litre.

6 Apparatus

6.1 Furnace, (figure 1) heated by electricity. Two such furnaces are required. One furnace shall have a zone of 160 mm \times 100 mm maintained at a uniform temperature of 400 $^{\circ}\text{C} \pm 10^{\circ}\text{C}$. The second shall have a zone of 160 mm \times 100 mm maintained at a uniform temperature of 900 $^{\circ}\text{C} \pm 5^{\circ}\text{C}$. The furnaces may be the stop-ended type or fitted at the back with a flue approximately 25 mm in diameter by 150 mm long.

The heat capacity of the 900 $^{\circ}\text{C}$ and/or 400 $^{\circ}\text{C}$ furnace shall be such that, with an initial temperature of 900 $^{\circ}\text{C}$ and/or 400 $^{\circ}\text{C}$, a temperature of 900 $^{\circ}\text{C} \pm 10^{\circ}\text{C}$ and/or 400 $^{\circ}\text{C} \pm 10^{\circ}\text{C}$ is regained within 4 min after insertion of a cold stand and its crucibles. The temperature shall be measured with a thermocouple as described in 6.3. The furnace can be designed specifically either for multiple determinations using a number of crucibles in one stand or for receiving one crucible and its stand. A position for the crucible stand shall be chosen within the zone of uniform temperature and this position used for all determinations.

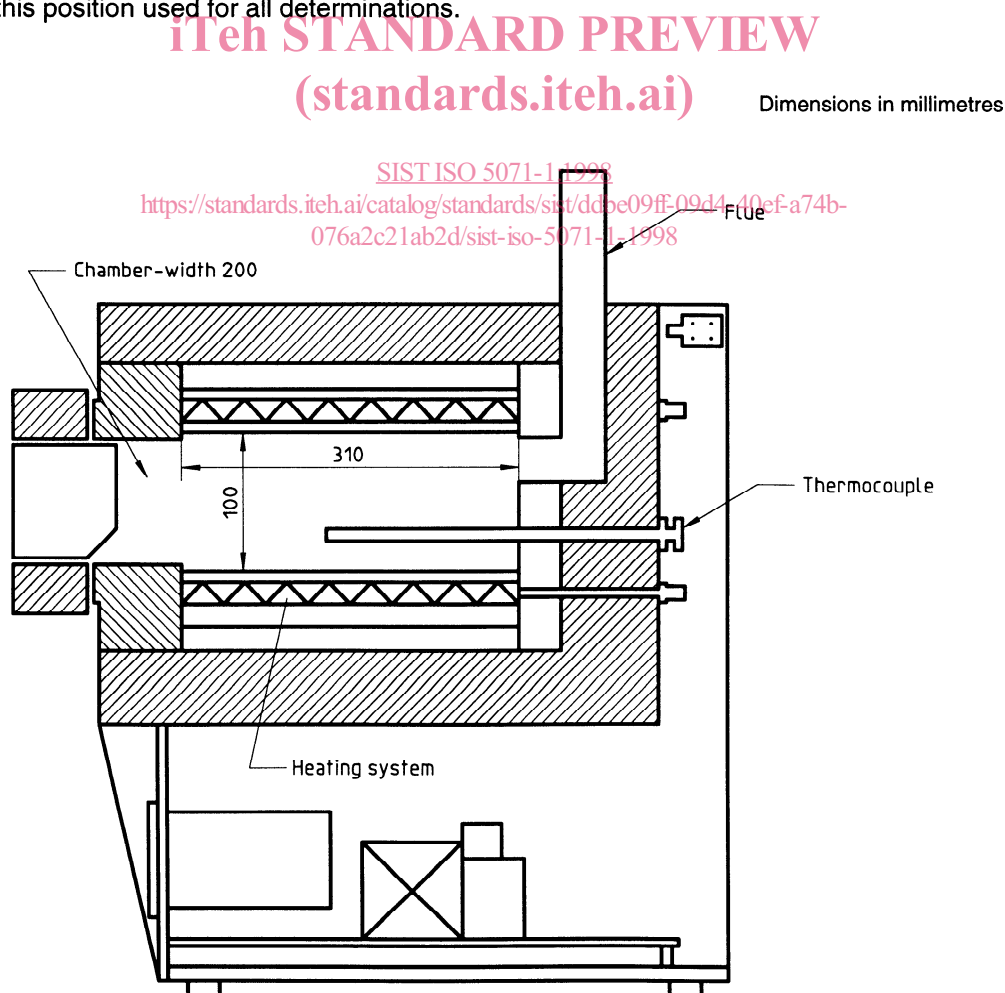


Figure 1 — Example of a suitable furnace

6.2 Oven, capable of being controlled at a temperature within the range 105 °C to 110 °C and with provision for passing a current of dry oxygen-free nitrogen through it at a rate sufficient to change the atmosphere 15 times per hour. The size of the chamber is suitable for containing the crucible (6.4).

6.3 Thermocouple, the temperature characteristics of the furnace shall be checked with an unsheathed thermocouple, of wire not thicker than 1 mm. The thermo-junction shall be inserted midway between the base of the crucible in its stand and the floor of the furnace. If the stand holds more than one crucible, the temperature under each crucible shall be checked in the same manner. If desired, a sheathed thermocouple may be permanently installed in the furnace with its thermo-junction as close as possible to the centre of the zone of uniform temperature; in this case, its temperature readings shall be correlated at frequent intervals with those of the unsheathed thermocouple, which is then inserted only when necessary.

NOTE — The temperature/electromotive force relationship of a thermo-junction maintained at elevated temperatures gradually changes with time.

6.4 Crucible and lid, a cylindrical crucible with a well fitting lid, both made of fused silica. The crucible and lid shall weigh between 10 g and 14 g and have dimensions approximating to those shown in figure 2. The fit of the lid on the crucible is critical to the determination and a lid shall be selected to match the crucible so that the horizontal clearance between them is not greater than 0,5 mm. After selection, the crucible and the lid shall be ground together to give smooth surfaces and then be given a common distinguishing mark. Crucibles of other refractory materials, or of platinum, can be used, provided that they give the results which agree with the recommended silica crucible, within the stated precision of the method (clause 10).

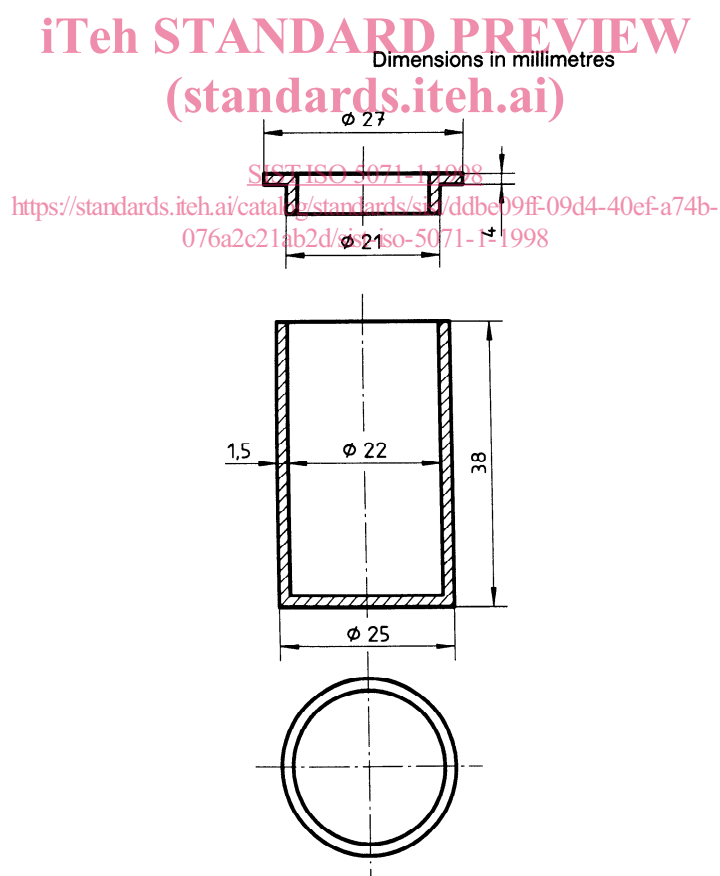


Figure 2 — Silica crucible and lid