

Soil quality - Pretreatment of samples by freeze-drying for subsequent analysis

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 16720:2007 sisaldab Euroopa standardi EN ISO 16720:2007 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 31.05.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 16720:2007 consists of the English text of the European standard EN ISO 16720:2007.</p> <p>This document is endorsed on 31.05.2007 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>This International Standard specifies a method for pretreatment of soil samples by freeze-drying for subsequent analysis. This International Standard is applicable to soil samples for subsequent determination of elements or organic compounds recognized as non-volatile under freeze-drying conditions. Generally, this International Standard can also be applied to samples from sludges and sediments. This method is also applicable as a first step for the determination of dry matter (or water) content, for instance in the case of samples with high water content.</p>	<p>Scope:</p> <p>This International Standard specifies a method for pretreatment of soil samples by freeze-drying for subsequent analysis. This International Standard is applicable to soil samples for subsequent determination of elements or organic compounds recognized as non-volatile under freeze-drying conditions. Generally, this International Standard can also be applied to samples from sludges and sediments. This method is also applicable as a first step for the determination of dry matter (or water) content, for instance in the case of samples with high water content.</p>
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ICS 13.080.20

Võtmesõnad:

ICS 13.080.20

English Version

Soil quality - Pretreatment of samples by freeze-drying for
subsequent analysis (ISO 16720:2005)

Qualité du sol - Prétraitement des échantillons par
lyophilisation pour analyse subséquente (ISO 16720:2005)

Bodenbeschaffenheit - Vorbehandlung von Proben durch
Gefriertrocknung für die anschließende Analyse (ISO
16720:2005)

This European Standard was approved by CEN on 25 February 2007.

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Foreword

The text of ISO 16720:2005 has been prepared by Technical Committee ISO/TC 190 "Soil quality" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 16720:2007 by Technical Committee CEN/TC 308 "Characterization of sludges", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2007, and conflicting national standards shall be withdrawn at the latest by September 2007.

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Endorsement notice

The text of ISO 16720:2005 has been approved by CEN as EN ISO 16720:2007 without any modifications.

**Soil quality — Pretreatment of samples
by freeze-drying for subsequent analysis**

*Qualité du sol — Prétraitement des échantillons par lyophilisation pour
analyse subséquente*



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Foreword

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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.

ISO 16720 was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 3, *Chemical methods and soil characteristics*.

Soil quality — Pretreatment of samples by freeze-drying for subsequent analysis

1 Scope

This International Standard specifies a method for pretreatment of soil samples by freeze-drying for subsequent analysis.

This International Standard is applicable to soil samples for subsequent determination of elements or organic compounds recognized as non-volatile under freeze-drying conditions. Generally, this International Standard can also be applied to samples from sludges and sediments.

This method is also applicable as a first step for the determination of dry matter (or water) content, for instance in the case of samples with high water content.

2 Normative references

The following referenced documents are indispensable for the application 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 11464, *Soil quality — Pretreatment of samples for physico-chemical analyses*

ISO 11465, *Soil quality — Determination of dry matter and water content on a mass basis — Gravimetric method*

3 Principle and general requirements

Before freeze-drying, samples shall be cooled below their eutectic points. These are rarely known, but freezing the samples below $-40\text{ }^{\circ}\text{C}$ is usually sufficient.

During freeze-drying, water is removed from the sample under vacuum conditions by direct conversion from ice to vapour (sublimation) which is collected in a condenser where it releases its heat energy and turns again into ice. Generally a temperature below $-50\text{ }^{\circ}\text{C}$ inside the condenser is suitable for usual applications.

Sublimation requires heat in order to take place within an acceptable range of time. When the frozen sample containers are connected to an external inlet manifold (see 5.1.2), heat energy is supplied by the laboratory atmosphere. In case of a drying chamber equipped with temperature-controlled carriers (see 5.1.1), this energy is provided by heating the carriers.

Vacuum conditions shall allow the generation of vapour pressure difference needed for sublimation and the continuous evacuation of water vapour from the sample. Throughout the drying process, the pressure inside the apparatus and the temperature of the sample(s) shall be such as to avoid sample thawing and loss of any compound of interest. This last point may be difficult to achieve due to the large range of possible energy levels of the bonds between compounds of interest and the solid phase. For compounds known as non-volatile, a final temperature of the sample between $-20\text{ }^{\circ}\text{C}$ to $-25\text{ }^{\circ}\text{C}$ is suitable. Other final temperatures may be needed for compounds recognized as more volatile. In all cases, the final step shall be as short as possible.