SLOVENSKI STANDARD
SIST EN 13039:2001

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Izboljševalci tal in rastni substrati - Določevanje organske snovi in pepela

Soil improvers and growing media - Determination of organic matter content and ash

Bodenverbesserungsmittel und Kultursubstrate - Bestimmung des Gehaltes an organischer Substanz und Asche

Amendements du sol et supports de culture - Détermination de la matiere organique et des cendres

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65.080 Gnojila Fertilizers

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EUROPEAN STANDARD
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English version

Soil improvers and growing media - Determination of organic matter content and ash

Amendements du sol et supports de culture - Détermination de la matière organique et des cendres

Bodenverbesserungsmittel und Kultursubstrate - Bestimmung des Gehaltes an organischer Substanz und Asche

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 223 "Soil improvers and growing media", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by June 2000, and conflicting national standards shall be withdrawn at the latest by June 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies a routine method for determining the organic matter and the ash content of soil improvers and growing media.

NOTE 1 The method is not applicable to liming materials or sewage sludges and is not suitable for materials like rockwool and foam slabs.

NOTE 2 The requirements of the standard may differ from the national legal requirements for the declaration of the products concerned.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 12579	Soil improvers and growing media - Sampling
EN 13040:1999	Soil improvers and growing media - Sample preparation for chemical and physical tests, determination of dry matter content, moisture content and laboratory compacted bulk density

3 Terms and definitions

For the purposes of this standard the terms and definitions in EN 12579 and the following apply.

3.1
organic matter
carbon fraction of a sample which is free from water and inorganic substances. The organic matter for the purposes of this standard is taken as equal to loss on dry incineration.

3.2
ash
residual mineral matter remaining after the destruction of organic matter/material by controlled burning.

4 Principle

The test portion is dried at 103 ºC, then ashed at 450 ºC. The ash is determined as the residue on ignition. The organic matter is taken to be the loss of mass on ignition. Both are expressed as a percentage by mass of the dried sample.

5 Apparatus

5.1 **Drying oven**, capable of maintaining a temperature of 103 °C ± 2 ºC.

5.2 **Electric muffle furnace**, capable of maintaining temperatures of 450 ºC ± 10 ºC and 550 ºC ± 10 ºC.

5.3 **Basin**, made from fused silica or quartz, of shallow form with a flat bottom, capable of holding a sample of 5 g. Typical dimensions are 70 mm width and 20 mm height.

5.4 **Desiccator** containing an active drying agent.

5.5 **Analytical balance** with a scale interval 0,001 g

6 Procedure

6.1 Test Sample

Prepare the test sample in accordance with clause 9 of EN 13040 : 1999.

6.2 Preparation of the basin

Heat the basin (**5.3**) for 16 h in the muffle furnace (**5.2**) at 550 ºC ± 10 ºC. Cool in the desiccator (**5.4**). After cooling, weigh to the nearest 0,001 g. Note the mass of the basin m_0.

NOTE The basin is heated to 550 °C to ensure that all volatile material is removed prior to the test.

6.3 Determination

Spread evenly over the surface of the basin (**5.3**) approximately 5 g of the test sample (**6.1**) and dry in the oven (**5.1**) at a temperature of 103 ºC ± 2 ºC for 4 h.

Allow the basin and contents to cool to room temperature in the desiccator (**5.4**) and weigh to the nearest 0,001 g. Place the basin and contents in the oven (**5.1**) maintained at 103 ºC ± 2 ºC for a further 1 h.

Allow the basin and contents to cool to room temperature in the desiccator (**5.4**) and weigh to the nearest 0,001 g. Repeat the operations of heating, cooling and weighing until the difference between two successive weighings is less than 0,01 g. Note the mass of the basin and dried sample m_1.

Place the basin and contents in the cool muffle furnace (**5.2**) and raise the temperature over approximately 1 h to 450 ºC ± 10 ºC. Maintain this temperature for 6 h. Allow the basin and contents to cool to room temperature in the desiccator (**5.4**) and weigh to the nearest 0,001 g. Place the basin and contents into the muffle furnace (**5.2**) maintained at 450 ºC ± 10 ºC for a further 1 h.

Allow the basin and contents to cool room temperature in the desiccator (**5.4**) and weigh to the nearest 0,001 g. Repeat the operations of heating, cooling and weighing until the difference between two successive weighings is less than 0,01 g. Note the mass of the basin and sample after ignition m_2.

7 Calculation and expression of results

The organic matter content, expressed as a percentage by mass of the dried sample, is given by the following equation:

$$W_{om} = \frac{m_1 - m_2}{m_1 - m_0} x100 \qquad (1)$$

The ash content, expressed as a percentage by mass of the dried sample, is given by the following equation.

$$W_{ash} = \frac{m_2 - m_0}{m_1 - m_0} x100 \qquad (2)$$

where W_{om} is the organic matter content in % m/m
W_{ash} is the ash content in % m/m
m_0 is the mass of the basin (in g);
m_1 is the mass of the basin and the sample after drying in grams;
m_2 is the mass of the basin and the sample after ignition in grams.

8 Precision

The repeatability and reproducibility of the organic matter (ash) of the sample measured in 2 separately prepared samples should be in accordance with Table A.1.

A summary of the results of an interlaboratory trial to determine the precision of the method in accordance with ISO 5725 is given in Annex A.

NOTE The values derived from the interlaboratory trial may not be applicable to concentrations and matrices other than those given.

9 Test Report

The test report shall include the following;

a) a complete identification of the sample;
b) a reference to this European Standard;
c) the results expressed in accordance with point 7;
d) any unusual features noticed during the determination;
e) details of any operation not specified in the European Standard or regarded as optional, as well as any factor which may have affected the results.

Annex A

(informative)

Results of an interlaboratory trial to determine the organic matter

An interlaboratory trial was organized in 1995 under the auspices of the European Committee for Standardization, to test the procedures specified in this European Standard

In this trial the number of laboratories given in Table A.1 determined the organic matter in three types of samples.

Table A.1 - Summary of the results of the interlaboratory trial for the determination of organic matter

Sample	Unfertilized peat perlite	Composted coarse bark	Composted straw and domestic sewage
Number of laboratories retained after eliminating outliers	19	18	19
Number of outliers (laboratories)	0	1	0
Mean Value [m/m %]	79,86	76,03	44,34
Repeatability standard deviation ,s_r [% m/m]	1,00	1,29	1,20
Repeatability relative standard deviation (%)	3,51	4,74	7,60
Repeatability limit, r = 2,8s_r [% m/m]	2,8	3,60	3,37
Reproducibility standard deviation ,s_R [% m/m]	1,51	2,33	2,26
Reproducibility relative standard deviation (%)	5,29	8,56	14,28
Reproducibility limit, r = 2,8s_R [% m/m]	4,23	6,51	6,33