SLOVENSKI STANDARD
oSIST prEN 15761:2022

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Rastni substrati - Določanje dolžine, širine, višine, volumna in prostorninske gostote

Pre-shaped growing media - Determination of length, width, height, volume and bulk density

Vorgeformte Kultursubstrate - Bestimmung von Länge, Breite, Dicke, Volumen und Schüttdichte

Supports de culture préformés - Détermination de la longueur, de la largeur, de la hauteur, du volume et de la masse volumique apparente

Ta slovenski standard je istoveten z: **prEN 15761**

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65.080 Gnojila Fertilizers

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English Version

Pre-shaped growing media - Determination of the dimensions measured and bulk density

Supports de culture préformés - Détermination de la longueur, de la largeur, de la hauteur, du volume et de la masse volumique apparente

Vorgeformte Kultursubstrate - Bestimmung von Länge, Breite, Dicke, Volumen und Schüttdichte

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 223.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 15761:2021) has been prepared by Technical Committee CEN/TC 223 “Soil improvers and growing media”, the secretariat of which is held by NEN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 15761:2009.

In comparison with the previous edition, the following technical modifications have been made:

— the text has been editorially revised, no technical changes to the described method itself have been made;

— plugs have been excluded from the scope;

— updated references in Clause 2;

— the terms and definitions are aligned with CEN/TS 17732:—;

— a dimensional measuring instrument has been added to Clause 5 and 7.3.1;

— a clause on sampling has been added;

— descriptions for other shapes, such as (truncated) conical material and cylindrical material, have been added to the text.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association.

Introduction

This document has been developed so that there is a standard method to measure and weigh pre-shaped growing media and to calculate the volume and bulk density.

The volume of growing media is a useful attribute for growers and is critical for ensuring plants have sufficient growing media for their root system.

The bulk density is crucial as the reporting of all chemical analyses is expressed in units of weight per volume, and the volume is determined from the weight of the sample used for the chemical analyses.

NOTE 1 In this document, mass and weight are used interchangeably with the same meaning.

Pre-shaped growing media are generally made from mineral wool, some are manufactured using polyurethane and others from stabilized organic material. They are known by various names, typically:

— “plugs” are small blocks used for seedlings, which are generally cylindrical in shape; once the seed has germinated the seedling in the plug might then be placed into “blocks”;

NOTE 2 Plugs are excluded in the scope of this document.

— “blocks” might have holes to take plugs and can vary in size; they are generally used for propagation purposes;

— “slabs” are used for growing vegetables and range in size.

1 Scope

This document describes a method for the determination of and the dimensions measured of the bulk density of pre-shaped growing media.

In this document, “pre-shaped growing media”:

— includes solid, regular shaped, stable growing media sold, which are ready for use as a growing media, where the dimensions and any corners are stable;

— does not include plugs;

— does not include solid growing media that has to be hydrated for it to form, varies in dimension with varying water content – for example, coir or peat slabs or growing bags.

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.

CEN/TS 17732[1], *Soil improvers and growing media — Terminology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TS 17732 and the following apply.

3.1
length
l
longer linear dimension of the major surface of the test specimen

3.2
width
w
shorter linear dimension of the major surface of the test specimen measured at right angles to the length

3.3
height
h
linear dimension measured top to bottom

3.4
depth
d
linear dimension measuring how deep recess intrude into the media

3.5
diameter
D
chord that runs through the centre point of the circle

[1] Under preparation. Current stage is: FprCEN/TS 17732:2021.

3.6
bulk density
indication of how much 1 l of the product weighs, being determined in a standardized way

Note 1 to entry: The bulk density is expressed in grams per litre (g/l) or in kilograms per cubic metre (kg/m^3).

3.7
plug
pre-shaped growing medium that consists of small blocks used for seedlings, which are generally cylindrical in shape

Note 1 to entry: Once the seed has germinated the seedling in the plug might then be placed into a "block".

3.8
block
pre-shaped growing medium that might have holes to take plugs

Note 1 to entry: Blocks are generally used for propagation purposes.

Note 2 to entry: Blocks can vary in size.

3.9
slab
pre-shaped growing medium used for growing vegetables

Note 1 to entry: Slabs can vary in size.

4 Principle

The test specimen is placed on a flat surface.

For regular rectangular material, measurements for the length, width and height are taken.

For (truncated) conical material and cylindrical material, measurements for height and diameter are taken.

The volume is calculated from these dimensions and, after the determination of the weight, the bulk density is calculated.

5 Apparatus

5.1 Flat surface, horizontal, flat stable surface, e.g. table top, which is large enough for the test specimen and the measuring devices.

5.2 Metal rule or metal tape, graduated in millimetres and permitting reading to 0,5 mm or less.

NOTE Measures conforming to the requirements of OIML R35-1:2007, *Material measures of length for general use. Part 1: Metrological and technical requirements* [2], Class II are appropriate. This can be obtained from http://www.oiml.org/publications/.

5.3 Height gauge, having a maximum scale interval of 0,5 mm.

5.4 Pressure plate, square with a flat base and having sides of dimensions 100 mm × 100 mm, which weighs (50 ± 1) g.

NOTE Any other linear measuring device might be used if the results can be determined to within 0,5 mm.

5.5 Balance, having a maximum scale interval of 0,1 g.

NOTE Any balance conforming to the requirements of OIML R76-1:2006, *Non-automatic weighing instruments. Part 1: Metrological and technical requirements – Tests* [3], Class II is appropriate. This can be obtained from http://www.oiml.org/publications/.

5.6 Dimensional measuring instrument, with a maximum scale of 0,5 mm.

NOTE Any instrument conforming to the requirements of Directive 2019/32/EU is appropriate.

6 Sampling and sample preparation

Sampling is not part of the method specified in this document. A recommended sampling method is given in EN 12579 [1].

7 Procedure

7.1 Accuracy

Record all dimensional measurements to the nearest 0,5 mm or less.

Record weight to the nearest 0,1 g or less.

7.2 Number of measurements

7.2.1 Measurement of 150 mm or less

For measurement of a nominal dimension of 150 mm or less, make one measurement using the pressure plate (5.4) and the height gauge (5.3). Position the pressure plate (5.4) centrally on the test specimen, covering the maximum area possible.

7.2.2 Measurement of more than 150 mm but less than 600 mm

For measurement of a nominal dimension of more than 150 mm or less than 600 mm, make two measurements at one-third and two-third intervals laterally across the surface being measured, using an appropriate rule or tape (5.2).

7.2.3 Measurement of more than 600 mm

For measurement of a nominal dimension of more than 600 mm, make three measurements at one-quarter, one-half and three-quarter intervals laterally across the surface being measured, using an appropriate rule or tape (5.2).

7.3 Test procedure

7.3.1 General

Lay the test specimen carefully on a flat surface (5.1). Either:

a) determine the dimensions of volume using a dimensional measuring instrument (5.6), or

b) determine the linear measurements by making the required number of measurements (7.2) between undamaged edges of the test specimen, keeping the tape or rule (5.2) perpendicular to the edge.

7.3.2 Test specimens with holes or grooves

If the test specimen has holes or grooves, such as a mineral wool blocks, then determine the volume of these recesses for subtracting from the external volume. Using the metal rule or tape (5.2), determine the length, width and determine the depth of each rectangular recess at two points on each axis.

Determine the diameter and depth of each cylindrical recess at two points for each axis. Ensure the depth is measured to the major recessed plane, and not to the depth of any guide hole used to drill the recessed hole.

If the recess is neither rectangular nor cylindrical, then determine its volume in a mathematically correct manner by using the average of at least two measurements per axis.

7.4 Determining the weight

After determining the dimensions of volume determine the weight of the test specimen using the balance (5.5).

8 Calculations and expression of results

8.1 Length, width, diameter and height

The recorded values of the appropriate dimension (length, width, diameter and height) of the test specimen, all expressed in millimetres, to calculate the mean values for *l*, *w, D* and *h*. Round each mean to the nearest millimetre.

8.2 Volume

8.2.1 Accuracy

Record all values for volume to the nearest cubic millimetre, and then divide by 10^6 to obtain the volume in litres. Record to four significant figures.

8.2.2 Test specimens with no recesses

Where more than one value has been measured, the mean value shall be used in the formulas to determine the volume.

Pre-shaped growing media come in different shapes. For rectangular material, (truncated) conical material and cylindrical material, formulas are given below. Other regular shapes are possible, including (truncated) pyramids with three-, four- or multi-sides. For these other regular shapes, use the appropriate dimensions and the appropriate formula.

For regular rectangular material, determine the volume by multiplying the values measured using Formula (1):

$$V = l \times w \times h \qquad (1)$$

where

- V is the volume, expressed in cubic millimetres (mm^3);
- l is the length, expressed in millimetres (mm);
- w is the width, expressed in millimetres (mm);
- h is the height, expressed in millimetres (mm).