



# SLOVENSKI STANDARD

## SIST EN 15761:2010

01-februar-2010

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

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

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

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**Ta slovenski standard je istoveten z: EN 15761:2009**

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**ICS:**

65.080

Gnojila

Fertilizers

**SIST EN 15761:2010**

**en,fr,de**

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EUROPEAN STANDARD

EN 15761

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2009

ICS 65.080

English Version

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

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

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## Foreword

This document (EN 15761:2009) 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of an identical text or by endorsement, at the latest by June 2010, and conflicting national standards shall be withdrawn at the latest by June 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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## Introduction

This European Standard has been produced 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.

Pre-shaped growing media is generally at present made from Stonewool or Rockwool or mineral wool. They are known by various names, typically:

- "plugs" are small blocks used for seedlings, which are generally cylindrical in shape and with a diameter from 20 mm; once the seed has germinated the seedling in the plug may then be placed into "blocks";
- "blocks" may have holes to take plugs and can vary in size from 40 mm × 40 mm × 40 mm up to 100 mm × 200 mm × 65 mm; they are generally used for propagation purposes;
- "slabs" are used for growing vegetables and range in size from 370 mm × 240 mm × 100 mm to 2 000 mm × 200 mm × 75 mm.

It is anticipated that this standard will be developed to encompass other new pre-shaped growing media in due course, e.g. coir blocks.

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## 1 Scope

This European Standard describes a method of determination of length, width, height, volume and bulk density of rectangular pre-shaped growing media.

In this standard "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 corners are stable, and the surfaces and edges are perpendicular to each other – including mineral wool and polyurethane products;
- 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.

The minimum linear dimension (length, width or height) for blocks to which this standard applies is 40 mm, and the maximum dimension is 2 000 mm.

## 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.

CR 13456:1999, *Soil improvers and growing media — Labelling, specifications and product schedules*

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## 3 Terms and definitions

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For the purposes of this document, the terms and definitions given in CR 13456:1999 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 perpendicularly to the length and the width planes

### 3.4

#### depth

*d*

linear dimension measuring how deep recess intrude into the media

### 3.5

#### bulk density

indication of how much 1 l of the product weighs, with the volume being determined in a standardized way

NOTE The bulk density is expressed in grams per litre (g/L) or in kilograms per cubic metre (kg/m<sup>3</sup>).

**EN 15761:2009 (E)****4 Principle**

The test specimen is placed on a flat surface and measurements for length, width and height 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* [1], Class II are appropriate. This can be obtained from <http://www.oiml.org/publications/>.

**5.3 Height gauge**, having an accuracy of at least 0,5 mm.

**5.4 Pressure plate**, square with a flat base and having sides of dimensions 100 mm x 100 mm, which weighs  $(50 \pm 1)$  g.

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

**5.5 Balance**, having an accuracy 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* [2], Class II is appropriate. This can be obtained from <http://www.oiml.org/publications/>.

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**6 Procedure****6.1 Accuracy**

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

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

**6.2 Number of measurements**

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

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.

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.



## 6.3 Test procedure

### 6.3.1 General

Lay the test specimen carefully on a flat surface. Determine the linear measurements by making the required number of measurements (6.2) between undamaged edges of the test specimen, keeping the tape or rule perpendicular to the edge.

### 6.3.2 Test specimens with holes or grooves

If the test specimen has holes or grooves, such as a mineral wool block for culturing, 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.

## 6.4 Determining the weight

After determining length, width and height (6.2), determine the weight of the test specimen using the balance (5.5).

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## 7 Calculations and expression of results

### 7.1 Length, width and height SIST EN 15761:2010

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Use the recorded values of the length, width and height of the test specimen, which are all expressed in millimetres, to calculate the mean values for  $l$ ,  $w$  and  $h$ . Round each mean to the nearest millimetre.

### 7.2 Volume

#### 7.2.1 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.

#### 7.2.2 Test specimens with no recesses

Determine the volume by multiplying the values or, where more than one value has been determined, the mean values for the length, width and height measurements.

#### 7.2.3 Test specimens with recesses

In the case of test specimens that have recesses, e.g. rock wool blocks, subtract the volume of plant holes and grooves from the externally measured volume. Calculate the volume of the recesses in the following way:

In the case of a rectangular recess, substitute the mean values for the length ( $l$ ), width ( $w$ ) and depth ( $d$ ) into the following formula:

$$v = l \times w \times d \quad (1)$$

where