SLOVENSKI STANDARD
SIST EN 15238:2023

01-marec-2023

Nadomešča:
SIST EN 15238:2007
SIST EN 15238:2007/AC:2009

Izboljševalci tal in rastni substrati - Določanje količine za materiale z velikostjo delcev, večjo od 60 mm

Soil improvers and growing media - Determination of quantity for materials with particle size greater than 60 mm

Bodenverbesserungsmittel und Kultursubstrate - Bestimmung der Menge für Materialien mit einer Partikelgröße über 60 mm

Amendements du sol et supports de culture - Détermination de la quantité pour les matériaux de granulométrie supérieure à 60 mm

Ta slovenski standard je istoveten z: **EN 15238:2022**

ICS:

65.080	Gnojila	Fertilizers

SIST EN 15238:2023 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15238

November 2022

ICS 65.080

Supersedes EN 15238:2006

English Version

Soil improvers and growing media - Determination of quantity for materials with particle size greater than 60 mm

Amendements du sol et supports de culture - Détermination de la quantité pour les matériaux de granulométrie supérieure à 60 mm

Bodenverbesserungsmittel und Kultursubstrate - Bestimmung der Menge für Materialien mit einer Partikelgröße über 60 mm

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

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Ref. No. EN 15238:2022 E

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European foreword

This document (EN 15238:2022) has been prepared by Technical Committee CEN/TC 223 “Soil improvers and growing media”, the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by May 2023 and conflicting national standards shall be withdrawn at the latest by May 2023.

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

This document supersedes EN 15238:2006.

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 have been made;

— references in Clause 2 and the Bibliography have been updated;

— the terms and definitions have been aligned with CEN/TS 17732:2022;

— the figure has been replaced by two other figures with an example of the apparatus.

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

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

Soil improvers and growing media are generally traded by volume as the weight of the product can be greatly affected by the moisture content.

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

It is important for both consumers and traders to know the volume of product being traded. Furthermore, for the cultivation of plants, it is the volume of the product, and not the weight, that is generally important. The volume is calculated from knowing the weight and bulk density of the product, the latter being determined from weighing a known reference volume of product. As some soil improvers and growing media are compressible it is important that this aspect be addressed in the method of determining the bulk density. A suitably competent person should undertake this testing.

For those materials traded by reference to its mass, this document recognizes the effects the moisture content can have on the quantity declared. Therefore, for such transactions, any weight is accompanied by the moisture content so that the solid matter content can be calculated.

1 Scope

This document specifies a method for the determination of quantity of soil improvers and growing media in bulk and in packages. This method is designed with an appropriate precision level so that it can be used to validate any quantity determination made.

This document is applicable to material in any form, reconstituted if necessary, but not to plugs, blocks and slabs sold as such by dimension; for these, see EN 15761.

This document applies to material that is in solid form, but not in block form to be sold by dimension, and which exceeds the particle size restriction in EN 12580 and where the declared nominal particle size is greater than 60 mm.

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 17732:2022, *Soil improvers and growing media - Terminology*

EN 12579:2013, *Soil improvers and growing media - Sampling*

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

EN 45501:2015, *Metrological aspects of non-automatic weighing instruments*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in CEN/TS 17732:2022 and the following apply.

3.1
batch
lot
quantity of goods manufactured by the same process under the same conditions, at the same time, and labelled in the same manner and are assumed to have the same characteristics to be sampled using a particular sampling plan

3.2
bulk material
material that is not packaged

3.3
container
receptacle or vessel in which material is delivered, including a lorry, ship, boat and packaging

3.4
ρ_b
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).

Note 2 to entry: 'Bulk density' in this document refers to the apparent density in air (based on conventional mass) and not the density in vacuum.

3.5
package
container and materials contained therein which are delivered and where the packaging remains with the material after delivery

Note 1 to entry: A package may be a loose-filled sack, a big bale or a compressed block in packaging.

[SOURCE: CEN/TS 17732:2022, 3.1.5, modified – Replaced "container" with "packaging".]

3.6
quantity
out-turn volume or mass being determined in a standardized way

4 Principle

4.1 For each batch of material, whether for delivery in bulk or in packages, the quantity of material is determined and declared either by volume or by weight.

4.2 Where the quantity is declared by volume then the material is weighed and then sampled and its bulk density determined. From this information the volume is calculated (see Clauses 6 to 11).

4.3 Where the quantity is declared by weight then the moisture content is also determined so that the dry matter weight can be determined and declared (see Clause 12).

NOTE The structure of the material can change with time and handling and this can affect the volume of the material.

5 Apparatus

5.1 Measuring cylinder, rigid, 50 l ± 1 l with a height to diameter ratio between 0,95:1 and 1:1, calibrated in accordance with Clause 6. The volume, V_1, shall be determined to the nearest 20 ml at 20 °C, with an uncertainty of measurement (k = 2) of no more than 100 ml.

NOTE 1 Information about the measurement and expression of uncertainty is given in the OIML Guide (G1) to the expression of uncertainty in measurement, (sometimes referred to as GUM) [5].

NOTE 2 A 400 mm internal diameter pipe of height 398 mm with an end cap might be suitable.

NOTE 3 For easy and safe handling of the filled measuring cylinder, lifting and emptying handles are advisable. For health and safety reasons, the filled measuring cylinder might require two persons to lift it.

5.2 Collar, rigid, of the same diameter as the measuring cylinder (5.1) and with a height of 75 mm ± 5 mm. Equipped with locating lugs to enable it to sit on the measuring cylinder correctly.

5.3 Fall controller, 100 mm ± 5 mm mesh size, held no more than 50 mm above the collar.

The fall controller shall be separated from the measuring cylinder (5.1) with collar (5.2) to avoid jogging or vibrating material in the measuring cylinder during the filling process.

NOTE Wires crossing each other perpendicularly form the mesh with 100 mm square holes.

5.4 Weighing instrument, used to determine the bulk density of the material by this method conforming to EN 45501:2015 and with a scale division no larger than 0,01 kg.

NOTE National legislation is likely to require that the equipment be verified before use, and so it will be marked with the 'CE' mark and a green 'M' to show it is legal to use for trade purposes, as required by European Directive 2014/31/EU [4].

The weighing instrument used for determining the mass of the total quantity of product (a bag or consignment) shall conform to class III of EN 45501:2015.

In order for the error on the weighing instrument to be acceptable the maximum scale interval shall conform to the requirements in Table 1.

Table 1 — Maximum scale intervals for weighing instruments

Mass kg	**Maximum scale interval for analogue instrument** g	**Maximum scale interval for digital instrument** g
up to 100	20	10
> 100 to 1 000	200	100
> 1 000 to 5 000	2 000	1 000
> 5 000	20 000	10 000

5.5 Straight edge, rigid, of rectangular cross section, of thickness not exceeding 5 mm, preferably with a sharp edge, and at least 700 mm long.

5.6 Shovel or scoop, which preserves the characteristics of the product, with dimensions sufficient to take a representative portion.

NOTE 1 Use of hands is unlikely to ensure a representative sample is transferred to the measuring cylinder.

NOTE 2 A snow or grain shovel might be suitable for large, coarse material.

5.7 Strike, transparent sheet of flat material, for instance toughened glass or acrylic glass which is easily large enough to cover the top of the measuring cylinder. Used to calibrate the measuring cylinder (5.1).

6 Calibration of the measuring cylinder

To calibrate the measuring cylinder (5.1), place the measuring cylinder and sufficient water together in a room so that the temperature of both stabilizes. Determine the temperature, T. Weigh it empty together with a strike, note its mass in kilograms, m_e. Weighing shall be made in kilograms on a weighing instrument with no greater than 10 g divisions, which complies with EN 45501:2015.

Fill to the brim with water using the strike. When the water level is near the top of the measuring cylinder, start to slide the strike onto the rim of the measuring cylinder and pick up the meniscus of the water on its underside. Filling continues gradually, continuing to slide the strike over the surface of the measuring cylinder so that no air bubbles are trapped under it. The measuring cylinder is completely filled when the strike covers the top of the measuring cylinder without any air being trapped under it.

Weigh the filled measuring cylinder and strike in kilograms, mass, m_f.

Calculate the volume of water by multiplying by the factor given in Table 2. This gives the volume of the measuring cylinder, V_T, in litres, at the temperature, T, at which it has been calibrated. Weigh the filled measuring cylinder and strike, mass, m_f. Calculate the mass of water, $m_w = m_f - m_e$.

Table 2 — Multiplication factor at various temperatures for the calculation of the volume of the measuring cylinder

Temperature °C	Factor
10	1,001 35
11	1,001 45
12	1,001 55
13	1,001 67
14	1,001 81
15	1,001 96
16	1,002 11
17	1,002 29
18	1,002 47
19	1,002 66
20	1,002 86
21	1,003 07
22	1,003 29
23	1,003 52
24	1,003 76
25	1,004 02
26	1,004 29
27	1,004 56
28	1,004 84
29	1,005 14

Calculate the volume of the measuring cylinder at 20 °C using the formula:

$$V_1 = V_T \left[E\left(20 - T\right) \right] \quad (1)$$

where

E is the coefficient of cubical expansion for the material from which the measuring cylinder is made, in 1/°C. For steel this is 0,000 033 /°C.

The volume shall be rounded to the nearest 10 ml.

NOTE In some countries there is a legal requirement to have the measuring cylinder calibrated by an accredited calibration laboratory.