SLOVENSKI STANDARD
SIST EN 12580:2023

01-marec-2023

Nadomešča:
SIST EN 12580:2013

Izboljševalci tal in rastni substrati - Določanje količine

Soil improvers and growing media - Determination of a quantity

Bodenverbesserungsmittel und Kultursubstrate - Bestimmung der Menge

Amendements organiques et supports de culture - Détermination de la quantité

Ta slovenski standard je istoveten z: **EN 12580:2022**

ICS:

65.080	Gnojila	Fertilizers

SIST EN 12580:2023 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12580

November 2022

ICS 65.080

Supersedes EN 12580:2013

English Version

Soil improvers and growing media - Determination of a quantity

Amendements organiques et supports de culture - Détermination de la quantité

Bodenverbesserungsmittel und Kultursubstrate - Bestimmung der Menge

This European Standard was approved by CEN on 5 July 2022.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN 12580:2022 E

Contents

Page

European foreword ... 3
Introduction ... 4
1 Scope ... 5
2 Normative references ... 5
3 Terms and definitions ... 5
4 Principle ... 6
5 Apparatus ... 6
6 Calibration of the measuring cylinder ... 8
7 Sampling ... 9
8 Determination of quantity by volume ... 9
9 Calculation and expression of results ... 11
10 Precision ... 12
11 Test report for determination of volume ... 12
12 Determination of quantity by weight ... 12
13 Test report for determination of weight ... 13
Annex A (informative) **Results of an interlaboratory trial to determine bulk density** ... 14
Bibliography ... 15

European foreword

This document (EN 12580:2022) 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 12580:2013.

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

As some soil improvers and growing media are compressible (and some might be presented in compressed blocks or bales), it is important that this aspect be addressed in the method of determining the bulk density. A suitably competent person should undertake this testing.

Even for materials traded by volume, the moisture content can have an effect as high moisture levels increase agglomerations, can reduce the ability to decompress or reconstitute materials, reduce their flow characteristics and give higher bulk densities and lower volumes.

NOTE Mass and weight are used interchangeably with the same meaning within this document.

The sampling of all materials prior to quantity determination is covered in EN 12579. The sample preparation is covered in EN 13040.

Quantity determination will be performed as soon as possible after preparation and sampling.

1 Scope

This document specifies methods for the determination of a 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 is not applicable for material with more than 10 % (*V*/*V*) of particles greater than 60 mm in size; for these, see EN 15238.

The requirements of this document might differ from the national legal requirements for the determination of the products concerned.

Material which has become excessively wet and which cannot be easily broken down into a flowable material will not be suitable for the determination of quantity and might not give a representative result. However, because of the diverse nature and bulk density of these materials, it is not possible to quantify what is 'excessive'.

This document is intended to be used by manufacturers, buyers and enforcement agencies in verifying claims made for these products.

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 reported either by volume or by weight.

4.2 The unit of measurement (volume or weight) used for the quantity determination needs to comply with specific regulations.

4.3 Where the quantity is declared by volume then the material is weighed and then sampled and its bulk density is determined. From this information, the volume is then calculated (see Clauses 6 to 10).

4.4 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 Clauses 11 to 13).

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, 20 l ± 0,4 l with a height to diameter ratio between 0,9:1 and 1:1. The volume V_1 shall be known to the nearest 10 ml at 20 °C, with an uncertainty of measurement (k = 2) of no more than 50 ml.

NOTE 1 A standard 300 mm internal diameter pipe of height 283 mm with an end cap can be suitable.

NOTE 2 The apparent weight of 1 l of water at 20 °C is 997,15 g. Therefore, no air buoyancy correction needs to be made.

NOTE 3 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 4 For convenience and ease of use it is advisable to have handles on the measuring cylinder.

NOTE 5 For stability it is useful to have three short legs/feet on the base of the measuring cylinder.

5.2 Collar, rigid, of the same diameter as the measuring cylinder (5.1) and with a height of 75 mm ± 2 mm, equipped with locating lugs to enable it to sit on the measuring cylinder correctly without friction.

NOTE For convenience and ease of use it is advisable to have two handles on the collar.

5.3 Fall controller, of either 20 mm ± 0,6 mm or 40 mm ± 1,3 mm or 60 mm ± 2 mm mesh size as required (see 8.5), held not more than 50 mm above the collar.

NOTE 1 Wires crossing each other at right angles form the mesh with the appropriately sized square holes.

NOTE 2 For convenience and ease of use it is advisable to have two handles on the fall controller.

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.

5.4 Equipment to retain the fall controller.

This may be a tripod but there may be other suitable means.

5.5 Weighing instrument.

For packaged material, the weighing instrument shall conform to Table 1 below with class III tolerances as specified in EN 45501:2015, unless more restrictive provisions exist in national regulations.

For bulk material, the weighing instrument shall conform to class III of EN 45501:2015.

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].

Table 1 — Maximum scale intervals for weighing instruments

Mass kg	**Maximum scale interval for analogue scales** g	**Maximum scale interval for digital scales** g
> 1 to 2,5	10	5
> 2,5 to 5	20	10
> 5 to 10	50	20
> 10 to 40	100	50
> 40	200	100

5.6 Straight-edge, rigid, of rectangular cross section, of thickness not exceeding 5 mm, preferably with a sharp edge, and at least 500 mm long.

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.

6 Calibration of the measuring cylinder

To calibrate the measuring cylinder (5.1), place the measuring cylinder and sufficient distilled water together in a room so that the temperature of both stabilizes. Determine the temperature, T. Weigh it empty together with a strike (5.7), mass m_e.

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 grams, mass, m_f. Calculate the mass of water using the formula:

$$m_w = m_f - m_e \quad (1)$$

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.

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