SLOVENSKI STANDARD
oSIST prEN 17428:2020

01-april-2020

Embalaža - Določevanje stopnje razkroja v simuliranih pogojih kompostiranja doma

Packaging - Determination of the degree of disintegration under simulated home composting conditions

Verpackung - Bestimmung des Zersetzungsgrades unter simulierten Heimkompostierungsbedingungen

Ta slovenski standard je istoveten z: prEN 17428

ICS:

13.030.99	Drugi standardi v zvezi z odpadki	Other standards related to wastes
55.020	Pakiranje in distribucija blaga na splošno	Packaging and distribution of goods in general

oSIST prEN 17428:2020 **en,fr,de**

EUROPEAN STANDARD

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ICS 13.030.99; 55.040

English Version

Packaging - Determination of the degree of disintegration under simulated home composting conditions

Verpackung - Bestimmung des Zersetzungsgrades unter simulierten Heimkompostierungsbedingungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 261.

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 17428:2020) has been prepared by Technical Committee CEN/TC 261 “Packaging”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

Introduction

The test method described in this document determines the degree of disintegration of test materials when exposed to a simulated well-managed home composting environment.

The disintegration of test materials is determined either by means of a weight evaluation method or by means of a surface evaluation method.

Determining the degree of disintegration of test materials under simulated home composting conditions is an important step within a test scheme to evaluate test materials such as carrier bags suitable for treatment in well-managed home composting installations.

1 Scope

This document specifies two methods of determining the degree of disintegration of test materials when exposed to a well-managed home composting conditions:

— weight evaluation method (WE method) using sieving and evaluation by weighing;

— surface evaluation method (SE method) using photographic slide frames and evaluation by surface area measurement.

The method is not applicable to the determination of the biodegradability of test materials under home composting conditions. Additional testing is necessary to be able to claim home compostability.

NOTE 1 The weight evaluation method using minimum 3 replicates is corresponding to the quantitative determination of disintegration, as expressed in prEN 17427[1].

NOTE 2 The weight evaluation method using 2 replicates and the surface evaluation method are corresponding to the qualitative determination of disintegration as expressed in prEN 17427[1].

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.

EN 13432, *Packaging — Requirements for packaging recoverable through composting and biodegradation — Test scheme and evaluation criteria for the final acceptance of packaging*

EN 15933, *Sludge, treated biowaste and soil — Determination of pH*

ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ISO 10390, *Soil quality — Determination of pH*

ISO 16929, *Plastics — Determination of the degree of disintegration of plastic materials under defined composting conditions in a pilot-scale test*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

[1] These notes could be deleted once prEN 17427 will be updated using the new names of the methods.

3.1
compost
organic soil conditioner obtained by biodegradation of a mixture consisting principally of vegetable residues, occasionally with other organic material and having a limited mineral content

[SOURCE: EN ISO 20200:2015 [1], 3.1]

3.2
compostability
ability of a material to be biodegraded in a composting process

Note 1 to entry: To claim compostability it shall have been demonstrated that a material can be biodegraded and disintegrated in a composting system (as can be shown by standard test methods) and completes its biodegradation during the end-use of the compost. The compost shall meet the relevant quality criteria. Quality criteria are e.g. low regulated metal content, no ecotoxicity, no obviously distinguishable residues.

[SOURCE: EN ISO 20200:2015 [1], 3.2]

3.3
composting
aerobic process designed to produce compost

[SOURCE: EN ISO 20200:2015 [1], 3.3]

3.4
home composting
composting process performed by a private individual with the aim of producing compost for his own use

[SOURCE: prEN 17427:2020 [7], 3.3]

3.5
disintegration
physical breakdown of a material into very small fragments

[SOURCE: EN ISO 20200:2015 [1], 3.4]

3.6
dry mass
mass of a sample measured after drying

Note 1 to entry: Dry mass is expressed as a percentage of the mass of the wet sample.

[SOURCE: EN ISO 20200:2015 [1], 3.5]

3.7
total dry solids
amount of solids obtained by taking a known volume of test material or compost and drying at about 105 °C to constant mass

[SOURCE: EN ISO 20200:2015 [1], 3.8]

3.8
volatile solids
amount of solids obtained by subtracting the residue obtained from a known volume of test material or compost after incineration at about 550 °C from the total dry solids content of the same sample

Note 1 to entry: The volatile-solids content is an indication of the amount of organic matter present.

[SOURCE: EN ISO 20200:2015 [1], 3.9]

3.9
well-managed home composting
home composting practice which meets the minimum required conditions to convert biowaste into compost

Note 1 to entry: See prEN 17427:2020, Annex E.

4 Weight evaluation method (WE Method)

4.1 Principle

The method determines the degree of disintegration of test materials on a laboratory scale test under conditions simulating well managed an aerobic home composting process. The solid waste test matrix used consists of a mixture of mature compost taken from a municipal or industrial composting plant, starch and rabbit food or of a mixture of mature compost taken from a municipal or industrial composting plant and municipal organic waste.

Pieces of the plastic test material are composted with this prepared solid waste test matrix. The degree of disintegration is determined after a composting cycle, by sieving the final matrix through a 2 mm sieve in order to recover the non-disintegrated residues. The reduction in mass of the test sample is considered as disintegrated material and used to calculate the degree of disintegration.

4.2 Solid waste test matrix

The solid waste test matrix shall consist either

a) of a weight based mixture of 90/1/1 ratio of mature compost of Rottegrad V with a total solids content of 50 % ± 5 %, chemically unmodified starch and rabbit feed, or

b) of a weight based mixture of 80/20 ratio of mature compost of Rottegrad V with a total solids content of 50 % ± 5 % and municipal organic waste cut to a grain size of less than 1 cm.

The same amount of chemically unmodified starch and rabbit feed or municipal organic waste may be re-inoculated once after a minimum test duration of 12 weeks.

NOTE The assignment of a maturity level to compost using the “Rottegrad” scale takes place on the basis of the determination of the maximum temperature (T_{max}) in a self-heating test using Dewar vessels. The measured maximum temperature after about 2 to 5 days is used to classify the compost as follows:

— Rottegrad I: T_{max} > 60 °C (fresh biowaste)

— Rottegrad II: T_{max} 50,1 °C to 60 °C

— Rottegrad III: T_{max} 40,1 °C to 50 °C

— Rottegrad IV: T_{max} 30,1 °C to 40 °C

— Rottegrad V: $T_{max} \leq 30$ °C (mature compost)

For details of the method, see Reference [8].

Well aerated compost from a municipal or industrial aerobic composting plant shall be used as the inoculum. Sieve the compost using a screen of mesh aperture of minimum 5 mm and maximum 10 mm. Afterwards remove any inert objects from the screen underflow, such as glass, stones, plastic or metal, larger than 2 mm manually. It is recommended that compost from a plant composting the organic fraction of solid municipal waste be used in order to ensure sufficient diversity of microorganisms. The compost shall not be older than four months.

The rabbit-feed shall be a commercial product based on alfalfa (lucerne) (*Medicago sativa*) and vegetable meal. If a product with a different composition is used, the composition shall be given in the test report. The protein content of the rabbit-feed shall be approximately 15 % and the cellulose content approximately 20 %.

The pH-value of the as prepared solid waste shall not be below 6. In this case the solid waste shall be replaced.

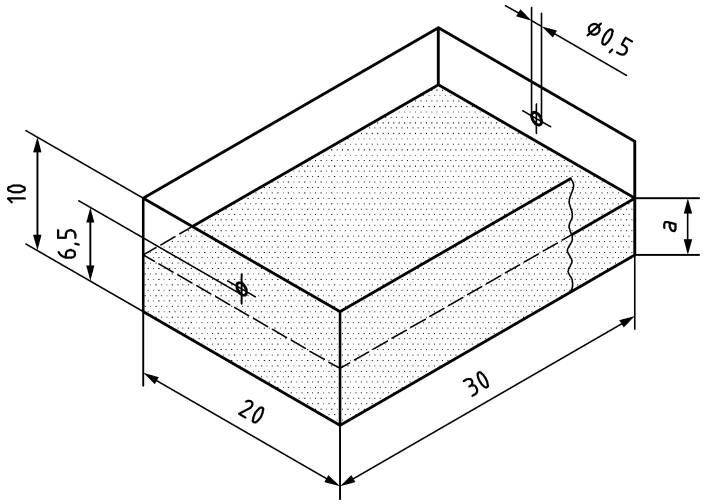
4.3 Composting reactor

The preferred composting reactor is a box made of polypropylene or other inert material, having the following dimensions: 30 cm × 20 cm × 10 cm (l, w, h). The box shall be covered with a lid assuring a tight seal to avoid excessive evaporation. Additionally, any gap between box and lid may be sealed with adhesive tape. In the middle of the two 20 cm wide sides, a hole of 5 mm diameter shall be made approximately 6,5 cm from the bottom of the box. These two holes provide gas exchange between the inner atmosphere and the outside environment and shall not be blocked.

Similar containers with a volume of a minimum of 5 l and a maximum of 10 l may also be used, provided that it can be verified that no unfavourable anaerobic conditions are generated. The container shall be closed in a way which avoids excessive drying-out of the contents. Again, openings shall be provided in order to allow gas exchange and ensure aerobic conditions throughout the composting phase.

NOTE Container volumes larger than 10 l increase the probability of exceeding the T_{max}: ≤ 30 °C.

An example of a suitable composting reactor filled with solid waste test material is given in Figure 1.



Key

1 Height of the matured compost

Figure 1 —Example of a suitable composting reactor filled with solid waste test material