
**Embalaža - Zahteve za embalažo, primerno za kompostiranje in biorazgradnjo -
Preskusna shema in ovrednotenje meril za sprejemljivost embalaže**

Packaging - Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging

Verpackung - Anforderungen an die Verwertung von Verpackungen durch Kompostierung und biologischen Abbau - Prüfschema und Bewertungskriterien für die Einstufung von Verpackungen (standards.iteh.ai)

Emballage - Exigences relatives aux emballages valorisables par compostage et biodégradation - Programme d'essai et critères d'évaluation de l'acceptation finale des emballages

Ta slovenski standard je istoveten z: EN 13432:2000

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55.020	Pakiranje in distribucija blaga na splošno	Packaging and distribution of goods in general

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EUROPEAN STANDARD
NORME EUROPÉENNE
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English version

**Packaging - Requirements for packaging recoverable through
composting and biodegradation - Test scheme and evaluation
criteria for the final acceptance of packaging**

Emballage - Exigences relatives aux emballages
valorisables par compostage et biodégradation -
Programme d'essai et critères d'évaluation de l'acceptation
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Verpackung - Anforderungen an die Verwertung von
Verpackungen durch Kompostierung und biologischen
Abbau - Prüfschema und Bewertungskriterien für die
Einstufung von Verpackungen

This European Standard was approved by CEN on 4 June 2000.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 261 "Packaging", the secretariat of which is held by AFNOR.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex Z, which is an integral part of this standard.

This standard forms one of a series of standards and reports prepared under Mandate M 200 rev.3 given to CEN by the European Commission and the European Free Trade Association to support the European Council and Parliament Directive on Packaging and Packaging Waste [94/62/EC]. The procedure for applying this standard in conjunction with the other mandated standards and reports is specified in EN 13427.

This standard contains Annexes A and E which are normative and Annexes B, C, D and Z which are informative

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 March 2001, and conflicting national standards shall be withdrawn at the latest by March 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

The Directive on Packaging and Packaging Waste (94/62/EC) defines requirements for packaging to be considered recoverable. This standard amplifies these requirements with respect to organic recovery. The European Standard EN 13427:2000 provides a framework within which this and four other standards may be used together to support a claim that a packaging is in compliance with the essential requirements for packaging to be placed on the market as required by the Directive.

The purpose of packaging is the containment, protection, handling, delivery and presentation of products. Organic recovery of used packaging is one of several recovery options within the overall life cycle of packaging. In order to save resources and minimise waste, the whole system in which the packaging takes part should be optimised. This includes prevention as well as reuse and recovery of packaging waste.

This European Standard presents a framework for self-assessment to determine whether the requirements of this standard have been met. Its approach is similar to that of systems standards such as the EN ISO 9000 and EN ISO 14000 series.

Organic recovery of packaging and packaging materials, which includes aerobic composting and anaerobic biogasification of packaging in municipal or industrial biological waste treatment facilities is an option for reducing and recycling packaging waste. Using these biological technologies, the aims of the Directive 94/62/EC of the European Parliament and of the Council on Packaging and Packaging Waste (Brussels 5 December 1994) in this respect can be met.

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1 Scope

This European Standard specifies requirements and procedures to determine the compostability and anaerobic treatability of packaging and packaging materials by addressing four characteristics :

- 1) biodegradability,
- 2) disintegration during biological treatment,
- 3) effect on the biological treatment process and
- 4) effect on the quality of the resulting compost.

In case of a packaging formed by different components, some of which are compostable and some other not, the packaging itself, as a whole is not compostable. However, if the components can be easily separated by hand before disposal, the compostable components can be effectively considered and treated as such, once separated from the non compostable components.

This European Standard covers the compostability of packaging itself but does not address regulations that may exist regarding the compostability of any residual contents.

This European Standard makes provision for obtaining information on the processing of packaging in controlled waste treatment plants but does not take into account packaging waste which may end up in the environment, through uncontrolled means, i.e. as litter.

The essential relationship between this European Standard and the four other (mandated) European Packaging Standards and one (mandated) CEN Report is specified in EN 13427:2000.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 13193:2000, *Packaging - Packaging and the environment – Terminology*.

EN 13427:2000, *Packaging and the environment - Requirements for the use of European standards in the field of packaging and packaging waste*.

.ISO 14851 : 1999, *Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium - Method by measuring the oxygen demand in a closed respirometer*.

ISO 14852 : 1999, *Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium - Method by analysis of evolved carbon dioxide*.

ISO 14855 : 1999, *Determination of the ultimate aerobic biodegradability and disintegration of plastic materials under controlled composting conditions - Method by analysis of evolved carbon dioxide..*

3 Terms and definitions

For the purposes of this standard, the following terms and definitions and those given in EN 13193:2000 and EN 13427:2000 apply :

3.1

constituent of a packaging material

all pure chemical materials and substances of which a packaging material is composed

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3.2

packaging component

part of packaging that can be separated by hand or by using simple physical means

3.3

disintegration

the physical falling apart into very small fragments of packaging and packaging materials

3.4

ultimate biodegradability

breakdown of an organic chemical compound by micro-organisms in the presence of oxygen to carbon dioxide, water and mineral salts of any other elements present (mineralization) and new biomass or in the absence of oxygen to carbon dioxide, methane, mineral salts and new biomass

3.5

total dry solids

amount of solids obtained by taking a known amount of test material or compost and drying at about 105 °C to constant weight

3.6

volatile solids

amount of solids obtained by subtracting the residues of a known amount of test material or compost after incineration at about 550 °C from the total dry solids content of the same sample. The volatile solids content is an indication of the amount of organic matter.

4 Requirements

4.1 Control of constituents

Constituents known to be, or expected to become, harmful to the environment during the biological treatment process (see clause 8), in excess of the limits given in Annex A.1, shall not be deliberately introduced into packaging or packaging materials intended to be designated as suitable for organic recovery.

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4.2 Assessment

4.2.1 General

Except as identified in clause 4.3, assessment of the biological treatability of packagings and packaging components shall include the following 5 assessment procedures as a minimum :

- characterization (see 4.2.2) ;
- biodegradability (see 4.2.3) ;
- disintegration including effects on the biological treatment process (see 4.2.4) ;
- compost quality (see 4.2.5) ;
- recognizability (see 4.2.6).

4.2.2 Characterization

Each packaging material under investigation shall be identified and characterized prior to testing including at least :

- information on, and identification of, the constituents of the packaging materials ;
- determination of the presence of hazardous substances, e.g. heavy metals ;
- determination of the organic carbon content, total dry solids and volatile solids of the packaging material used for biodegradation and disintegration tests.

NOTE In addition to the chemical characteristics for volatile solids, pass levels for heavy metals are also provided as their total absence is not possible.

4.2.3 Biodegradability

To be designated as organically recoverable, each packaging, packaging material or packaging component shall be inherently and ultimately biodegradable as demonstrated in laboratory tests (clause 6) and to the criteria and pass levels given in Annex A.2.

4.2.4 Disintegration

To be designated as organically recoverable, each packaging, packaging material or packaging component shall disintegrate in a biological waste treatment process (see clause 7) to the criteria and pass levels given in Annex A.3, without any observable negative effect on the process.

4.2.5 Compost quality

To be designated as organically recoverable, no packaging or packaging component thereof, submitted to a biological waste treatment process, shall be recorded as having a negative effect on the quality of the resulting compost (see clause 8).

4.2.6 Recognizability

The packaging or packaging component which is intended for entering the biowaste stream must be recognizable as compostable or biodegradable by the end user by appropriate means.

4.3 Exemptions

4.3.1 Equivalent form

A packaging material demonstrated to be organically recoverable in a particular form, shall be accepted as being organically recoverable in any other form having the same or a smaller mass to surface ratio or wall thickness.

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4.3.2 Materials of natural origin

Chemically unmodified packaging materials and constituents of natural origin, such as wood, wood fibre, cotton fibre, starch, paper pulp or jute shall be accepted as being biodegradable without testing (see clause 6) but shall be chemically characterized (see 4.2) and fulfil the criteria for disintegration (see clause 7) and compost quality (see clause 8).

4.4 Recording of assessment outcome

4.4.1 Check list

For each packaging the result of each assessment or test undertaken (as required in 4.2.1), shall be recorded on an assessment check list and their combined outcome used to determine whether a packaging material or a packaging is biologically treatable and therefore suitable for organic recovery. The check list shall provide for the identification of any supplementary information (see Annex C).

4.4.2 Supporting documentation

The check list together with any other information(including externally sourced technical data) necessary to support the conclusions reached in the assessments shall be retained and made available for inspection if required.

4.5 Application

The application of this standard to any particular packaging shall be as specified in EN 13427:2000.

5 Organization of a test scheme

In view of the relative complexity of some of the procedures involved, it is essential that assessment and testing be undertaken in a formal and organized way. Whilst this standard does not attempt to specify such organization, a flowchart of a recommended scheme is provided in Annex B.

Where required the disintegration test may also be used to obtain information on any negative effects that the packaging material or packaging could have on the composting process.

Compost is not only the final product of the aerobic composting process but also the aerobically stabilized product of the anaerobic biogasification process. Where appropriate an anaerobic disintegration test may be performed additionally.

NOTE It is important to recognise that it is not necessary that biodegradation of packaging material or packaging be fully completed by the end of biological treatment in technical plants but that it can subsequently be completed during the use of the compost produced.

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6 Laboratory tests on biodegradability

Only biodegradation tests that provide unequivocal information on the inherent and ultimate biodegradability of a packaging material or its significant organic constituents shall be used.

The controlled aerobic composting test, which is technically identical with ISO 14855:1999 shall be used unless inappropriate to the type and properties of the material under test.

In the event that alternative methods are necessary an internationally standardized biodegradability test method (see ISO/TR 15462) shall be used, in particular ISO 14851:1999 and ISO 14852:1999 which are designed for polymeric materials.

NOTE 1 Information on how to handle materials having poor water solubility for use in aquatic biodegradation tests may be obtained from ISO 10634.

NOTE 2 For the purpose of this standard it is sufficient to determine biodegradability under aerobic conditions. If in a special case additional information on biogasification is required, a method with a high-solids test environment such as ISO 15985 should preferably be used. For screening anaerobic biodegradability for example ISO 14853:1999 or ISO 11734 may be used.

7 Determination of disintegration

Unless technically impossible the packaging, packaging material or packaging component shall be tested for disintegration in the form in which it will ultimately be used. The controlled pilot-scale test shall be used as the reference test method. A test in a full-scale treatment facility, may, however, be accepted as equivalent. The pilot-scale test simulates, as closely as possible, the real conditions of a high-level aerobic composting facility whereas a full-scale facility (technical composting plant) has always by definition real conditions and treatment periods.

In practice packaging materials are tested and from this it is concluded that a complete packaging will be disintegrated if all of its materials are capable of disintegration. A complete packaging should, however, be tested in cases where a direct conclusion is not possible e.g. if two or more packaging materials are firmly joined together forming a fixed multi-layer structure.

Due to the nature and analytical conditions of the disintegration test the test results cannot differentiate between biodegradation and abiotic disintegration but they are required to demonstrate that a sufficient disintegration of the test material is achieved within the specified treatment time of biowaste. By combining these observations with the information obtained from the laboratory tests it can be concluded whether a test material is sufficiently biodegradable under the known conditions of biological waste treatment and whether biodegradability can be brought to a conclusion with the use of the compost.

Pilot-scale composting tests are also suitable instruments for investigating any negative effects of the test material on the composting process if sufficient test material is introduced. This can be achieved by direct comparison of process parameters in reactors with and without test material.

The compost obtained at the end of the disintegration test may be used for analytical and biological quality control testing. When tests on ecotoxicity are performed it is important to use compost from disintegration tests which have been run with and without the test material to compare the test results directly and to find out any relative ecotoxic effects (see clause 8).

NOTE 1 For the purpose of this standard it is sufficient to determine disintegration under aerobic composting conditions. If in a special case information on anaerobic treatability is required an anaerobic pilot-scale test or a full-scale facility for solid waste treatment should be used.

NOTE 2 Special attention should be given to the visual aspects of compost. Visual contamination of compost, as evidenced by reduction of aesthetic acceptability, should not be significantly increased by any post composting residues of the packaging material introduced.