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**Polimerni materiali - Ugotavljanje stopnje razpada polimernih materialov pri določenih pogojih kompostiranja v pilotnem merilu (ISO/DIS 16929:2020)**

Plastics - Determination of the degree of disintegration of plastic materials under defined composting conditions in a pilot-scale test (ISO/DIS 16929:2020)

Kunststoffe - Bestimmung des Zersetzungsgrades von Kunststoffmaterialien unter festgelegten Bedingungen der Kompostierung mittels einer Technikumsmaßstab-Prüfung (ISO/DIS 16929:2020)

Plastiques - Détermination du degré de désintégration des matériaux plastiques dans des conditions de compostage définies lors d'un essai à échelle pilote (ISO/DIS 16929:2020)

**Ta slovenski standard je istoveten z: prEN ISO 16929**

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**ICS:**

83.080.01	Polimerni materiali na splošno	Plastics in general
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## Plastics — Determination of the degree of disintegration of plastic materials under defined composting conditions in a pilot-scale test

*Plastiques — Détermination du degré de désintégration des matériaux plastiques dans des conditions de compostage définies lors d'un essai à échelle pilote*

ICS: 83.080.01

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# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Principle</b> .....	<b>2</b>
<b>5 Apparatus</b> .....	<b>3</b>
<b>6 Test procedure</b> .....	<b>4</b>
6.1 Actions before and during incubation.....	4
6.1.1 Start-up of the test.....	4
6.1.2 Turning.....	5
6.1.3 Termination of the test.....	5
6.2 Analysis and process control.....	6
6.2.1 Start-up of the test.....	6
6.2.2 During the test.....	7
6.2.3 Termination of the test.....	8
<b>7 Calculation</b> .....	<b>8</b>
<b>8 Validity of the test</b> .....	<b>9</b>
<b>9 Test report</b> .....	<b>9</b>
<b>Bibliography</b> .....	<b>10</b>

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## ISO/DIS 16929:2020(E)

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 14, *Environmental aspects*.

This fourth edition cancels and replaces the third edition (ISO 16929:2019), which has been technically revised.

The main changes compared to the previous edition are as follows:

- in [6.1.1](#), the minimum amount of biowaste has been changed to 15 kg from 30 kg due to the smaller size of composting bins;
- in [6.2.2.3](#), a separate temperature profile has been added to cover tests including also production of compost for ecotoxicity tests .

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

The biological treatment of biodegradable plastic materials includes aerobic composting in well-operated, municipal or industrial biological waste treatment facilities. Determining the degree of disintegration of plastic materials in a pilot-scale plant is an important step within a test scheme to evaluate the compostability of such materials.

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# Plastics — Determination of the degree of disintegration of plastic materials under defined composting conditions in a pilot-scale test

**WARNING** — Compost can contain potentially pathogenic organisms. Therefore, appropriate precautions should be taken when handling it.

## 1 Scope

This document is used to determine the degree of disintegration of plastic materials in a pilot-scale aerobic composting test under defined conditions. It forms part of an overall scheme for the evaluation of the compostability of plastics as outlined in ISO 17088.

The test method laid down in this document is also used to determine the influence of the test material on the composting process and the quality of the compost obtained. It cannot be used to determine the aerobic biodegradability of a test material. Other methods are available for this (for example, see ISO 14851, ISO 14852 or ISO 14855-1 and ISO 14855-2).

## 2 Normative references

There are no normative references in this document.

## 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 <http://www.electropedia.org/>

### 3.1

#### **degradation**

irreversible process leading to a significant change in the structure of a material, typically characterized by a loss of properties (e.g. integrity, molecular mass or structure, mechanical strength) and/or by fragmentation, affected by environmental conditions, proceeding over a period of time and comprising one or more steps

### 3.2

#### **biodegradation**

*degradation* (3.1) caused by biological activity especially by enzymatic action leading to a significant change in the chemical structure of a material

### 3.3

#### **disintegration**

physical breakdown of a material into very small fragments

### 3.4

#### **compost**

organic soil conditioner obtained by *biodegradation* (3.3) of a mixture principally consisting of various vegetable residues, occasionally with other organic material, and having a limited mineral content

## ISO/DIS 16929:2020(E)

## 3.5

**composting**

aerobic process designed to produce *compost* (3.4)

## 3.6

**compostability**

property of a material to be biodegraded in a *composting* (3.5) 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* (3.3) during the end-use of the compost. The compost shall meet the relevant quality criteria. Quality criteria include low content of regulated metals, no ecotoxicity, no obviously distinguishable residues.

## 3.7

**maturity of compost**

assignment of the maturity of a *compost* (3.4) based on the measurement of the maximum temperature in a self-heating test using Dewar vessels

Note 1 to entry: It is expressed in terms of the so-called "Rottegrad" (see 6.2.3.1).

## 3.8

**total dry solids**

amount of solids obtained by taking a known volume of test material or *compost* (3.4) and drying at about 105 °C to constant mass

## 3.9

**volatile solids**

amount of solids obtained by subtracting the residues of a known volume of test material or *compost* (3.4) after incineration at about 550 °C from the *total dry solids* (3.8) content of the same sample

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

## 4 Principle

The disintegration test is performed under defined and standardized composting conditions on a pilot-scale level.

The test material is mixed with fresh biowaste in a precise concentration and introduced into a defined composting environment. A natural ubiquitous microbial population starts the composting process spontaneously and the temperature increases. The composting mass is regularly turned over and mixed. Temperature, pH-value, moisture content and gas composition are regularly monitored. They should fulfil certain requirements to ensure sufficient and appropriate microbial activity. The composting process is continued until a fully stabilized compost is obtained. This is usually the case after 12 weeks.

The compost is visually observed at regular time intervals to detect any adverse effect of the test material on the composting process. At the end of the test, the maturity of compost is determined, and the mixture of compost and test material is sieved through 2 mm and 10 mm mesh sieves. The disintegration of the test material is evaluated based on the total dry solids by comparing the fraction of test material retained by the 2 mm sieve and the amount tested. The compost obtained at the end of the composting process may be used for further measurements, such as chemical analyses and ecotoxicity tests.