



# SLOVENSKI STANDARD

## oSIST prEN ISO 20200:2023

01-februar-2023

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### Polimerni materiali - Ugotavljanje razpada polimernih materialov pri kompostiranju v laboratorijskem merilu (ISO/DIS 20200:2022)

Plastics - Determination of the degree of disintegration of plastic materials under composting conditions in a laboratory-scale test (ISO/DIS 20200:2022)

Kunststoffe - Bestimmung des Zersetzungsgrades von Kunststoffmaterialien unter nachgebildeten Kompostierungsbedingungen mittels einer Prüfung im Labormaßstab (ISO/DIS 20200:2022)

Plastiques - Détermination du degré de désintégration de matériaux plastiques dans des conditions de compostage lors d'un essai de laboratoire (ISO/DIS 20200:2022)

**Ta slovenski standard je istoveten z: prEN ISO 20200**

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#### **ICS:**

83.080.01	Polimerni materiali na splošno	Plastics in general
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**oSIST prEN ISO 20200:2023**

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# DRAFT INTERNATIONAL STANDARD

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

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 Synthetic solid waste</b> .....	<b>2</b>
<b>6 Composting reactor</b> .....	<b>3</b>
<b>7 Procedure</b> .....	<b>3</b>
7.1 Test material preparation.....	3
7.2 Start-up of the test.....	4
7.3 Incubation.....	4
7.3.1 General.....	4
7.3.2 Type 1: constant thermophilic incubation.....	4
7.3.3 Type 2: two-stages incubation.....	4
7.3.4 Mesophilic incubation (optional).....	5
<b>8 Monitoring the composting process</b> .....	<b>5</b>
<b>9 Diagnostic parameters</b> .....	<b>5</b>
9.1 Odour.....	5
9.2 Visual appearance.....	5
9.3 Chemical analysis.....	6
9.4 Determination of dry mass and volatile solids.....	6
<b>10 Termination of the test and measurement of the degree of disintegration</b> .....	<b>6</b>
<b>11 Calculation of degree of disintegration</b> .....	<b>6</b>
<b>12 Expression of results</b> .....	<b>7</b>
<b>13 Validity of the test</b> .....	<b>7</b>
<b>14 Test report</b> .....	<b>7</b>
<b>Bibliography</b> .....	<b>9</b>

## ISO/DIS 20200:2022(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 third edition cancels and replaces the second edition (ISO 20200:2015), which has been technically revised.

The main changes are as follows:

- the [Clause 3](#) “Terms and definitions” has been updated;
- a new incubation mode (type 2) has been added, based on two stages ([Clause 4](#) and [7.3](#));
- the dimensions of the samples has been modified ([7.1](#)).

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 test method described in this document determines the degree of disintegration of plastic materials when exposed to a composting environment. The method does not require special bioreactors, and is scaled for use in any general-purpose laboratory. It requires the use of a standard and homogeneous synthetic solid waste. The synthetic waste components are dry, clean, safe products, which can be stored in the laboratory without any odour or health problems. The synthetic waste is of constant composition and devoid of any undesired plastic material which could be erroneously identified as test material at the end of testing, altering the final evaluation. The bioreactors are small, as is the amount of synthetic waste to be composted (approximately 3 l). With the limited amount of test material, this method provides a simplified test procedure. This test method is not aimed at determining the biodegradation of plastic materials under composting conditions. Further testing will be necessary before being able to claim compostability.

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

## 1 Scope

This document specifies a method of determining the degree of disintegration of plastic materials when exposed to a laboratory-scale composting environment. The method is not applicable to the determination of the biodegradability of plastic materials under composting conditions. Further testing is necessary to be able to claim compostability.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

## 3 Terms and definitions

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

### 3.1

#### **compost**

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

[SOURCE: ISO 14855-2:2018, 3.1, modified — “fruit and garden” was added.]

### 3.2

#### **compostability**

potential of a material to be biodegraded and disintegrated in a defined and controlled composting process without leaving visible and toxic residues

Note 1 to entry: Should be demonstrated in accordance with ISO 17088 or another suitable standard.

### 3.3

#### **composting**

aerobic process designed to produce compost

### 3.4

#### **laboratory scale composting**

aerobic process designed to produce compost at laboratory scale under environmental conditions simulating those experienced in an industrial compost pile

### 3.5

#### **disintegration**

physical breakdown of a material into very small fragments

## ISO/DIS 20200:2022(E)

### 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.

### 3.7

#### **mesophilic incubation**

incubation carried out within a temperature range between 15 °C and 45 °C to allow the development of mesophilic microorganisms

### 3.8

#### **thermophilic incubation**

incubation carried out within a temperature range between 40 °C and 75 °C to allow the development of thermophilic microorganisms

### 3.9

#### **total dry solids**

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

[SOURCE: ISO 18606:2013, 3.4]

### 3.10

#### **volatile solids**

amount of solids obtained by subtracting the residue obtained from a known mass of test material or compost after heating in inert atmosphere 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.

## 4 Principle

The method determines the degree of disintegration of test materials on a laboratory scale under conditions simulating an intensive aerobic composting process. The solid matrix used consists of a synthetic solid waste inoculated with mature compost taken from a municipal or industrial composting plant. Pieces of the plastic test material are incubated with this prepared solid matrix. There are two types of incubation. The first (type 1) is the one originally applied to this test method. It involves maintaining the reactors at a constant temperature of 58 °C for 84 days. The second (type 2) involves a first incubation period at 58 °C (duration 56 days), followed by a second period at 45 °C (until 84 days). The second method has been added to simulate a decreasing temperature profile over time similar to the one set for standard test method ISO 16929:2021. 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.

## 5 Synthetic solid waste

The composition of the synthetic waste used in this method is described in [Table 1](#).

Well aerated compost from a municipal or industrial aerobic composting plant shall be used as the inoculum. The compost inoculum shall be homogeneous and free from large inert objects such as glass, stones, or pieces of metal. Remove any such objects manually and then sieve the compost on a screen of mesh aperture between 0,5 cm and 1 cm. Compost from a plant composting the organic fraction of solid municipal waste should be used in order to ensure sufficient diversity of microorganisms. If such a compost is not available, then compost from plants treating farmyard waste or mixtures of garden waste and solid municipal waste can be used. The compost shall not be older than four months.