

STN	Stanovenie úplnej aeróbnej biodegradability plastových materiálov za podmienok kontrolovaného kompostovania Metóda analýzou uvoľneného oxidu uhličitého Časť 2: Gravimetrické meranie uvoľneného oxidu uhličitého v laboratórnych podmienkach (ISO 14855-2: 2018)	STN EN ISO 14855-2 64 8003
------------	--	--

Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions - Method by analysis of evolved carbon dioxide - Part 2: Gravimetric measurement of carbon dioxide evolved in a laboratory-scale test (ISO 14855-2:2018)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/19

Obsahuje: EN ISO 14855-2:2018, ISO 14855-2:2018

Oznámením tejto normy sa ruší
STN EN ISO 14855-2 (64 8003) z decembra 2009

127962

EUROPEAN STANDARD

EN ISO 14855-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2018

ICS 83.080.01

Supersedes EN ISO 14855-2:2009

English Version

Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions - Method by analysis of evolved carbon dioxide - Part 2: Gravimetric measurement of carbon dioxide evolved in a laboratory-scale test (ISO 14855-2:2018)

Détermination de la biodégradabilité aérobie ultime des matériaux plastiques dans des conditions contrôlées de compostage - Méthode par analyse du dioxyde de carbone libéré - Partie 2: Mesurage gravimétrique du dioxyde de carbone libéré lors d'un essai de laboratoire (ISO 14855-2:2018)

Bestimmung der vollständigen aeroben Bioabbaubarkeit von Kunststoff-Materialien unter den Bedingungen kontrollierter Kompostierung - Verfahren mittels Analyse des freigesetzten Kohlenstoffdioxides - Teil 2: Gravimetrische Messung des freigesetzten Kohlenstoffdioxides im Labormaßstab (ISO 14855-2:2018)

This European Standard was approved by CEN on 21 August 2018.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey 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

EN ISO 14855-2:2018 (E)

Contents	Page
European foreword.....	3

European foreword

This document (EN ISO 14855-2:2018) has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 "Plastics" the secretariat of which is held by NBN.

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 February 2019, and conflicting national standards shall be withdrawn at the latest by February 2019.

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 ISO 14855-2:2009.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 14855-2:2018 has been approved by CEN as EN ISO 14855-2:2018 without any modification.

INTERNATIONAL STANDARD

ISO
14855-2

Second edition
2018-07

Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions — Method by analysis of evolved carbon dioxide —

Part 2: Gravimetric measurement of carbon dioxide evolved in a laboratory-scale test

Détermination de la biodégradabilité aérobie ultime des matériaux plastiques dans des conditions contrôlées de compostage — Méthode par analyse du dioxyde de carbone libéré —

Partie 2: Mesurage gravimétrique du dioxyde de carbone libéré lors d'un essai de laboratoire



Reference number
ISO 14855-2:2018(E)

© ISO 2018

ISO 14855-2:2018(E)**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	3
5 Reagents	3
6 Apparatus	4
7 Procedure	5
7.1 Preparation of the inoculum.....	5
7.2 Preparation of the sea sand.....	5
7.3 Preparation of test material and reference material.....	5
7.4 Starting up the test.....	6
7.5 Measurement of the evolved carbon dioxide.....	7
7.6 Incubation period.....	7
7.7 Termination of the test.....	8
8 Calculation	8
8.1 Theoretical amount of carbon dioxide evolved by test material.....	8
8.2 Percentage biodegradation.....	8
9 Expression and interpretation of results	9
10 Validity of results	9
11 Test report	9
Annex A (informative) Basic principle of the test	11
Annex B (informative) Example of an apparatus using an electrically heated composting vessel	13
Annex C (informative) Derivation of the formula used to calculate the degree of biodegradation from the amount of carbon dioxide evolved	15
Bibliography	16

ISO 14855-2:2018(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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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.

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

This second edition cancels and replaces the first edition (ISO 14855-2:2007), which has been technically revised. It also incorporates the Technical Corrigendum ISO 14855-2:2007/Cor.1:2009.

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

- The correct values for the particle size of soda talc given in the Technical Corrigendum 1 ISO 14855-2:2007/Cor.1:2009 have been adopted.
- The following numbers of composting vessels have been provided:
 - a) three test vessels for the test mixture;
 - b) three vessels for blank controls;
 - c) three vessels for checking inoculum activity using a reference material.
- The next criterion has been added to the list of validity criteria in [Clause 10](#):
 - c) the inoculum in the blank has produced more than 50 mg but less than 150 mg of carbon dioxide per gram of volatile solids (mean values) after 10 days of incubation.

A list of all parts in the ISO 14855 series can be found on the ISO website.

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.

Introduction

Management of plastics waste is a serious problem in the world. Plastics recovery technologies include material recovery (mechanical recycling, chemical or feedstock recycling, and biological or organic recycling) and energy recovery (heat, steam or electricity as a substitute for fossil fuels or other fuel resources). The use of biodegradable plastics is one valuable recovery option (biological or organic recycling).

Several ISO standards for determining the ultimate aerobic/anaerobic biodegradability of plastic materials have been published. In particular, ISO 14855-1 is a common test method that measures the amount of carbon dioxide evolved using methods such as continuous infrared analysis, gas chromatography or titration.

Compared with ISO 14855-1, the amounts of compost inoculum and test sample used in this document are one-tenth the size. In order to ensure the activity of the compost inoculum, inert material that gives the mixture the same texture as soil is mixed into the inoculum. The carbon dioxide evolved from the test vessel is determined by absorbing it in a carbon dioxide trap and carrying out gravimetric analysis of the absorbent. The method described in this document, which uses a closed system to capture the carbon dioxide evolved, can also be used to obtain valuable information, by means of isotopic-labelling studies, on the way in which the molecular structure of co-polymers degrades.

Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions — Method by analysis of evolved carbon dioxide —

Part 2: Gravimetric measurement of carbon dioxide evolved in a laboratory-scale test

WARNING — Sewage, activated sludge, soil and compost may contain potentially pathogenic organisms. Therefore, appropriate precautions should be taken when handling them. Toxic test compounds and those whose properties are unknown should be handled with care.

1 Scope

This document specifies a method for determining the ultimate aerobic biodegradability of plastic materials under controlled composting conditions by gravimetric measurement of the amount of carbon dioxide evolved. The method is designed to yield an optimum rate of biodegradation by adjusting the humidity, aeration and temperature of the composting vessel.

The method applies to the following materials:

- natural and/or synthetic polymers and copolymers, and mixtures of these;
- plastic materials that contain additives such as plasticizers or colorants;
- water-soluble polymers;
- materials that, under the test conditions, do not inhibit the activity of microorganisms present in the inoculum.

If the test material inhibits microorganisms in the inoculum, another type of mature compost or pre-exposure compost can be used.

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.

ISO 11721-1, *Textiles — Determination of resistance of cellulose-containing textiles to micro-organisms — Soil burial test — Part 1: Assessment of rot-retardant finishing*

ISO 14855-1, *Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions — Method by analysis of evolved carbon dioxide — Part 1: General method*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN