
Polimerni materiali - Ugotavljanje dokončne anaerobne biodegradacije plastičnih materialov v vodnem sistemu - Metoda z merjenjem proizvodnje bioplina (ISO 14853:2016)

Plastics - Determination of the ultimate anaerobic biodegradation of plastic materials in an aqueous system - Method by measurement of biogas production (ISO 14853:2016)

Kunststoffe - Bestimmung der vollständigen anaeroben Bioabbaubarkeit von Kunststoff-Materialien in einem wässrigen Medium - Verfahren mittels Analyse der Biogasentwicklung (ISO 14853:2016)

Plastiques - Évaluation de la biodégradabilité anaérobie ultime des matériaux plastiques en milieu aqueux - Méthode par détermination de la production de biogaz (ISO 14853:2016)

Ta slovenski standard je istoveten z: EN ISO 14853:2017

ICS:

83.080.01	Polimerni materiali na splošno	Plastics in general
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SIST EN ISO 14853:2018

en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 14853

December 2017

ICS 83.080.01

English Version

**Plastics - Determination of the ultimate anaerobic
biodegradation of plastic materials in an aqueous system -
Method by measurement of biogas production (ISO
14853:2016)**

Plastiques - Évaluation de la biodégradabilité
anaérobie ultime des matériaux plastiques en milieu
aqueux - Méthode par détermination de la production
de biogaz (ISO 14853:2016)

Kunststoffe - Bestimmung der vollständigen anaeroben
Bioabbaubarkeit von Kunststoff-Materialien in einem
wässrigen Medium - Verfahren mittels Analyse der
Biogasentwicklung (ISO 14853:2016)

This European Standard was approved by CEN on 17 October 2017.

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European foreword

The text of ISO 14853:2016 has been prepared by Technical Committee ISO/TC 61 “Plastics” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 14853:2017 by 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of an identical text or by endorsement, at the latest by June 2018, and conflicting national standards shall be withdrawn at the latest by June 2018.

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.

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INTERNATIONAL STANDARD

**ISO
14853**

Second edition
2016-07-15

Plastics — Determination of the ultimate anaerobic biodegradation of plastic materials in an aqueous system — Method by measurement of biogas production

*Plastiques — Évaluation de la biodégradabilité anaérobie ultime des
matériaux plastiques en milieu aqueux — Méthode par détermination
de la production de biogaz*

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Reference number
ISO 14853:2016(E)

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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 on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*.

This second edition cancels and replaces the first edition (ISO 14853:2005), which has been technically revised. It also incorporates the Technical Corrigendum ISO 14853:2005/Cor.1:2009.

Introduction

With the increasing use of plastics, their recovery and disposal have become a major issue. As a first priority, recovery should be promoted. For example, plastic litter, which originates mainly from consumers, is difficult to recover completely. Additional examples of materials difficult to recover are found in the disposal of fishing tackle, agricultural mulch films and water-soluble polymers. These plastic materials tend to leak from closed waste management infrastructures into natural environments. Biodegradable plastics are now emerging as one of the available options to solve such environmental issues. Plastic materials, such as products or packaging, which are sent to anaerobic treatment facilities should be potentially biodegradable. Therefore, it is very important to determine the potential biodegradability of such materials and to obtain a quantitative measure of their biodegradability in anaerobic environments.

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Plastics — Determination of the ultimate anaerobic biodegradation of plastic materials in an aqueous system — Method by measurement of biogas production

WARNING — Sewage and activated sludge may contain potentially pathogenic organisms. Therefore, appropriate precautions should be taken when handling them. Digesting sewage sludge produces flammable gases which present fire and explosion risks. Care should be taken when transporting and storing quantities of digesting sludge. Toxic test chemicals and those whose properties are not known should be handled with care and in accordance with safety instructions. The pressure meter and microsyringes should be handled carefully to avoid needle stick injuries. Contaminated syringe needles should be disposed of in a safe manner.

1 Scope

This International Standard specifies a method for the determination of the ultimate anaerobic biodegradability of plastics by anaerobic microorganisms. The conditions described in this International Standard do not necessarily correspond to the optimum conditions for the maximum degree of biodegradation to occur. The test calls for exposure of the test material to sludge for a period of up to 90 d, which is longer than the normal sludge retention time (25 to 30 d) in anaerobic digesters, although digesters at industrial sites can have much longer retention times.

The method applies to the following materials:

- natural and/or synthetic polymers, copolymers or mixtures thereof;
- plastic materials which contain additives such as plasticizers, colorants or other compounds;
- water-soluble polymers;
- materials which, under the test conditions, do not inhibit the microorganisms present in the inoculum. Inhibitory effects can be determined using an inhibition control or by another appropriate method (see e.g. ISO 13641). If the test material is inhibitory to the inoculum, a lower test concentration, another inoculum or a pre-exposed inoculum can be used.

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.

3.1

ultimate anaerobic biodegradation

breakdown of an organic compound by microorganisms in the absence of oxygen to carbon dioxide, methane, water and mineral salts of any other elements present (mineralization) plus new biomass

3.2

primary anaerobic biodegradation

structural change (transformation) of a chemical compound by microorganisms, resulting in the loss of a specific property