
Polimerni materiali - Določanje aerobne biorazgradljivosti neplavajočih materialov, izpostavljenih morskim sedimentom - Metoda z analizo sproščenega ogljikovega dioksida (ISO 22404:2019)

Plastics - Determination of the aerobic biodegradation of non-floating materials exposed to marine sediment - Method by analysis of evolved carbon dioxide (ISO 22404:2019)

Kunststoffe - Bestimmung des aeroben Bioabbaus von nicht-schwimmenden Materialien, die marinem Sediment ausgesetzt sind - Verfahren mittels Analyse des freigesetzten Kohlenstoffdioxids (ISO 22404:2019)

Plastiques - Détermination de la biodégradation aérobie des matériaux non flottants exposés aux sédiments marins - Méthode par analyse du dioxyde de carbone libéré (ISO 22404:2019)

Ta slovenski standard je istoveten z: EN ISO 22404:2021

ICS:

13.020.40	Onesnaževanje, nadzor nad onesnaževanjem in ohranjanje	Pollution, pollution control and conservation
83.080.01	Polimerni materiali na splošno	Plastics in general

SIST EN ISO 22404:2022**en,fr,de**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 22404:2022

<https://standards.iteh.ai/catalog/standards/sist/5e60df6-c4ff-4dea-98d3-f73214c597d8/sist-en-iso-22404-2022>

EUROPEAN STANDARD

EN ISO 22404

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2021

ICS 83.080.01

English Version

Plastics - Determination of the aerobic biodegradation of
non-floating materials exposed to marine sediment -
Method by analysis of evolved carbon dioxide (ISO
22404:2019)

Plastiques - Détermination de la biodégradation
aérobie des matériaux non flottants exposés aux
sédiments marins - Méthode par analyse du dioxyde de
carbone libéré (ISO 22404:2019)

Kunststoffe - Bestimmung des aeroben Bioabbaus von
nicht-schwimmenden Materialien, die marinem
Sediment ausgesetzt sind - Verfahren mittels Analyse
des freigesetzten Kohlenstoffdioxids (ISO 22404:2019)

This European Standard was approved by CEN on 8 November 2021.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, 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

Contents	Page
European foreword.....	3

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 22404:2022
<https://standards.iteh.ai/catalog/standards/sist/5e60df6-c4ff-4dea-98d3-f73214c597d8/sist-en-iso-22404-2022>

European foreword

The text of ISO 22404:2019 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 22404:2021 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 May 2022, and conflicting national standards shall be withdrawn at the latest by May 2022.

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.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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

iTeh STANDARD PREVIEW

(standards.iteh.ai)

Endorsement notice

The text of ISO 22404:2019 has been approved by CEN as EN ISO 22404:2021 without any modification.

SIST EN ISO 22404:2022
<https://standards.iteh.ai/catalog/standards/sist/5e60dfe6-c4ff-4dea-98d5-f73214c597d8/sist-en-iso-22404-2022>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 22404:2022](https://standards.iteh.ai/catalog/standards/sist/5e60df6-c4ff-4dea-98d3-f73214c597d8/sist-en-iso-22404-2022)

<https://standards.iteh.ai/catalog/standards/sist/5e60df6-c4ff-4dea-98d3-f73214c597d8/sist-en-iso-22404-2022>

INTERNATIONAL
STANDARD

ISO
22404

First edition
2019-09

**Plastics — Determination of the
aerobic biodegradation of non-
floating materials exposed to marine
sediment — Method by analysis of
evolved carbon dioxide**

*Plastiques — Détermination de la biodégradation aérobie des
matériaux non flottants exposés aux sédiments marins — Méthode
par analyse du dioxyde de carbone libéré*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 22404:2022](https://standards.iteh.ai/catalog/standards/sist/5e60df66-c4ff-4dea-98d3-f73214c597d8/sist-en-iso-22404-2022)

<https://standards.iteh.ai/catalog/standards/sist/5e60df66-c4ff-4dea-98d3-f73214c597d8/sist-en-iso-22404-2022>



Reference number
ISO 22404:2019(E)

© ISO 2019

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 22404:2022

<https://standards.iteh.ai/catalog/standards/sist/5e60df6-c4ff-4dea-98d3-f73214c597d8/sist-en-iso-22404-2022>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

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.....	2
5 Test environment.....	2
6 Reagents.....	2
7 Apparatus.....	3
8 Procedure.....	3
8.1 Test material.....	3
8.2 Reference material.....	4
8.3 Preparation of the sediment.....	4
8.4 Test setup.....	4
8.5 Pre-conditioning phase.....	4
8.6 Start of the test.....	5
8.7 Carbon dioxide measurement.....	5
8.8 End of the test.....	6
9 Calculation and expression of results.....	6
9.1 Calculation.....	6
9.1.1 Amount of CO ₂ produced.....	6
9.1.2 Percentage of biodegradation.....	8
9.2 Expression and interpretation of results.....	8
10 Validity of results.....	9
11 Test report.....	9
Bibliography.....	10

ISO 22404:2019(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 on 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 the following URL: www.iso.org/iso/foreword.html. (standards.iteh.ai)

This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 14, *Environmental aspects*. SIST EN ISO 22404:2022

[https://standards.iteh.ai/catalog/standards/sist/5e60df66-c4ff-4dea-98d3-](https://standards.iteh.ai/catalog/standards/sist/5e60df66-c4ff-4dea-98d3-7321-6f97d71e-d1e6-2014-01-01)

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

Products made with biodegradable plastics and other biodegradable materials are designed to be recoverable by means of organic recycling in composting plants or in anaerobic digesters. The uncontrolled dispersion of biodegradable plastics in natural environments is not desirable. The biodegradability of products cannot be considered as an excuse to spread wastes that should be recovered and recycled. However, test methods to measure rate and level of biodegradation in natural environments (such as soil or the marine environment) are of interest in order to better characterize the behaviour of plastics in these very particular environments. As a matter of fact, some plastics are used in products that are applied in the sea (for example, fishing gear) and sometimes they can get lost or put willingly in marine environment. The characterization of biodegradable plastic materials can be enlarged by applying specific test methods that enable the quantitative assessment of biodegradation of plastics exposed to marine sediment and seawater. In order to carry out a proper product design, it is important to know whether a plastic material is inherently biodegradable when exposed to marine inocula.

This document provides a test method for calculating and reporting biodegradation level obtained under laboratory conditions using a marine inoculum. The marine inoculum is sediment sampled at the tidal zone. The plastic material is exposed to this environmental matrix and biodegradation is followed by measuring the evolved CO₂.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 22404:2022](https://standards.iteh.ai/catalog/standards/sist/5e60df66-c4ff-4dea-98d3-f73214c597d8/sist-en-iso-22404-2022)

<https://standards.iteh.ai/catalog/standards/sist/5e60df66-c4ff-4dea-98d3-f73214c597d8/sist-en-iso-22404-2022>