

This is a preview of "ISO 17556:2012". [Click here to purchase the full version from the ANSI store.](#)

Second edition
2012-08-15

Plastics — Determination of the ultimate aerobic biodegradability of plastic materials in soil by measuring the oxygen demand in a respirometer or the amount of carbon dioxide evolved

Plastiques — Détermination de la biodégradabilité aérobie ultime des matériaux plastiques dans le sol par mesure de la demande en oxygène dans un respiromètre ou de la teneur en dioxyde de carbone libéré



Reference number
ISO 17556:2012(E)

© ISO 2012

This is a preview of "ISO 17556:2012". [Click here to purchase the full version from the ANSI store.](#)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2012

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

This is a preview of "ISO 17556:2012". [Click here to purchase the full version from the ANSI store.](#)

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Principle	3
5 Test environment	4
6 Materials	4
7 Apparatus	4
8 Procedure	4
8.1 Preparation of the test material	4
8.2 Preparation of the reference material	5
8.3 Preparation of the test soil	5
8.4 Start-up and execution of the test	7
9 Calculation and expression of results	9
9.1 Calculation	9
9.2 Expression and interpretation of results	10
10 Validity of results	10
11 Test report	10
Annex A (informative) Principle of a manometric respirometer (example)	12
Annex B (informative) Example of a system for measuring the amount of carbon dioxide evolved	13
Annex C (informative) Examples of methods for the determination of evolved carbon dioxide	14
Annex D (informative) Theoretical oxygen demand (ThOD)	16
Annex E (informative) Example of a determination of the amount and the molecular mass of water-insoluble polymer remaining at the end of a biodegradation test	17
Annex F (informative) Examples of long-term tests	18
Annex G (informative) Round-robin testing	22
Bibliography	26

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 17556 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*.

This second edition cancels and replaces the first edition (ISO 17556:2003), which has been technically revised. The main changes are as follows:

- a) the introduction has been revised;
- b) a definition of the term "total organic carbon" has been added (see 3.14);
- c) the temperature of the test environment has been changed (see Clause 5);
- d) the specifications for the analytical instrument for determining the amount of carbon dioxide evolved have been revised (see 7.2.3);
- e) Subclause 8.1 describing the preparation of the test material has been revised;
- f) Subclause 8.3.1 describing the collection and sieving of soil has been revised;
- g) the use of a standard soil is now permitted as an alternative to natural soil (see 8.3.2);
- h) Subclause 8.4 describing the start-up and execution of the test has been revised;
- i) the test report has been extended (see Clause 11);
- j) a new annex (Annex F) giving examples of long-term tests has been added;
- k) a new annex (Annex G) giving the results of round-robin testing has been added.

This is a preview of "ISO 17556:2012". [Click here to purchase the full version from the ANSI store.](#)

Introduction

A number of plastic materials and products have been designed for applications ending up in or on soil. They have been developed for applications where biodegradation is beneficial from a technical, environmental, social or economic standpoint. Examples can be found in agriculture (e.g. mulching film), horticulture (e.g. twines and clips, flower pots, pins), funeral items (e.g. body bags), recreation (e.g. plastic "clay" pigeons for shooting, hunting cartridges), etc. In many cases, recovery and/or recycling of these plastic items is either difficult or not economically viable. Various types of biodegradable plastics have been developed which have been designed to biodegrade and disappear *in situ* at the end of their useful life. Several International Standards specify test methods for determining the ultimate aerobic or anaerobic biodegradation of plastic materials in aqueous or compost conditions. Considering the use and disposal of biodegradable plastics, it is important to establish a test method to determine the ultimate aerobic biodegradation of such plastic materials in soil.