AS ISO 14852—2005
ISO 14852:1999

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Australian Standard™

Plastic materials—Determination of the ultimate aerobic biodegradability in an aqueous medium—Method by analysis of evolved carbon dioxide

STANDARDS AUSTRALIA

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PREFACE

This Standard was prepared by Standards Australia Committee EV-017, Degradability of Plastics.

This Standard is identical with and has been reproduced from ISO 14852:1999, *Determination of the ultimate aerobic biodegradability of plastic materials in an aqueous medium—Method by analysis of evolved carbon dioxide*.

The objective of this Standard is to specify a method, for measuring the amount of carbon dioxide evolved for the determination of the degree of aerobic biodegradability of plastic materials, including those containing formulation additives.

As this Standard is reproduced from an international Standard, the following applies:

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(b) In the source text 'this International Standard' should read 'this Australian Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

(d) An upper case 'L' substitutes for 'l' when referring the symbol for the unit, litres.

EV-017 agreed that readers of the Standard should be advised that in Clause 7.1, the conical flask should be reinforced for safety.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

The references to International Standards should be replaced by references to the following Australian Standards.

ISO Standards		*Australian Standards*	
ISO		AS	
10634	Water quality—Guidance for the preparation and treatment of poorly water-soluble organic compounds for the subsequent evaluation of their biodegradability in an aqueous medium	4351	Biodegradability—Organic compound in an aqueous medium
		4351.6	Guidance for the determination of biodegradability of poorly soluble organic compounds

Only international references that have been adopted as Australian Standards have been listed.

INTRODUCTION

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

NOTES

AUSTRALIAN STANDARD

Plastic materials—Determination of the ultimate aerobic biodegradability in an aqueous medium—Method by analysis of evolved carbon dioxide

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 International Standard specifies a method, by measuring the amount of carbon dioxide evolved, for the determination of the degree of aerobic biodegradability of plastic materials, including those containing formulation additives. The test material is exposed in a synthetic medium under laboratory conditions to an inoculum from activated sludge, compost or soil.

If an unadapted activated sludge is used as the inoculum, the test simulates the biodegradation processes which occur in a natural aqueous environment; if a mixed or pre-exposed inoculum is used, the method can be used to investigate the potential biodegradability of a test material.

The conditions used in this International Standard do not necessarily correspond to the optimum conditions allowing maximum biodegradation to occur, but the standard is designed to determine the potential biodegradability of plastic materials or give an indication of their biodegradability in natural environments.

The method enables the assessment of the biodegradability to be improved by calculating a carbon balance (optional, see annex C).

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 8192[2]). 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

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8245:1999, *Water quality — Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC).*

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