



BSI Standards Publication

Plastics — Determination of the ultimate anaerobic biodegradation of plastic materials in controlled slurry digestion systems — Method by measurement of biogas production

National foreword

This British Standard is the UK implementation of [ISO 13975:2019](#). It supersedes [BS ISO 13975:2012](#), which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/89, Plastics - Environmental Aspects.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Plastics — Determination of the ultimate anaerobic biodegradation of plastic materials in controlled slurry digestion systems — Method by measurement of biogas production

*Plastiques — Évaluation de la biodégradabilité anaérobie ultime
des matériaux plastiques dans des systèmes de digestion de boue
contrôlés — Méthode par mesurage de la production de biogaz*



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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).

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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.

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

This second edition cancels and replaces the first edition ([ISO 13975:2012](http://www.iso.org/iso/13975:2012)), which has been technically revised. The main changes compared to the previous edition are as follows:

- at least following numbers of test vessels have been provided;
 - three test vessels for the test mixture;
 - three vessels for blank controls;
 - three vessels for checking inoculum activity using a reference material;
- the Clausius-Clapeyron equation has been collected (see [Formula D.1](#)).

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

Biological recycling (biorecycling), together with mechanical recycling and chemical recycling, is a viable option for the recovery of plastic waste. This document specifies a method of evaluating the anaerobic biodegradability of such waste in a controlled anaerobic slurry system. This is a representative anaerobic digestion test method and system for biodegradable plastic waste.

The production of a biogas is observed under anaerobic conditions suitable for the growth of thermophilic or mesophilic microorganisms. The biogas is collected in a bag under atmospheric pressure, and the biogas volume is measured with a syringe or a gas burette. The biodegradability of the test material is evaluated from the sum of the amount of carbon dioxide dissolved in the supernatant and the cumulative quantity of evolved biogas. This document describes a biodegradation test method for plastic materials in a controlled anaerobic slurry system. It differs from [ISO 15985](#) which uses high-solids anaerobic digestion conditions, and [ISO 14853](#) which uses an aqueous system in an anaerobic environment.