

Water quality — Evaluation of the “ultimate” anaerobic biodegradability of organic compounds in digested sludge — Method by measurement of the biogas production

The European Standard EN ISO 11734:1998 has the status of a British Standard

ICS 07.100.20

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee EH/3, Water quality, to Subcommittee EH/3/5, Biological methods, upon which the following bodies were represented:

- BLWA Ltd. (The Association of the Laboratory Supply Industry)
- Department of Economic Development (Northern Ireland)
- Department of Health
- Department of the Environment (Her Majesty's Inspectorate of Pollution)
- Department of the Environment (Water Directorate)
- Freshwater Biological Association
- Institution of Water and Environmental Management
- Ministry of Agriculture, Fisheries and Food
- National Rivers Authority
- Royal Society of Chemistry
- Scottish Natural Heritage
- Soap and Detergent Industry Association
- Water Research Centre

This British Standard, having been prepared under the direction of the Health and Environment Sector Board, was published under the authority of the Standards Board and comes into effect on 15 July 1996

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The following BSI references relate to the work on this standard:
Committee reference EH/3/5
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Amendments issued since publication

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National foreword

This British Standard is the English language version of EN ISO 11734:1998. It retains a dual identifier as BS 6068-5.21:1996.

It is identical with ISO 11734:1995 published by the International Organization for Standardization (ISO).

The international standard was prepared by ISO Technical Committee 147, Water quality, with the active participation and approval of the UK.

BS 6068 is being published in a series of Parts subdivided into Sections that will generally correspond to particular international standards. Sections are being, or will be, published in Parts 1 to 7, which, together with Part 0, are listed below:

- *Part 0: Introduction;*
- *Part 1: Glossary;*
- *Part 2: Physical, chemical and biochemical methods;*
- *Part 3: Radiological methods;*
- *Part 4: Microbiological methods;*
- *Part 5: Biological methods;*
- *Part 6: Sampling;*
- *Part 7: Precision and accuracy.*

NOTE The tests described in this Section of BS 6068 should only be carried out by suitably qualified persons with an appropriate level of biological expertise. Standard biological procedures should be followed throughout.

Textual errors. When adopting the text of the international standard, the textual errors listed below were discovered. They have been marked in the text and have been reported to ISO in a proposal to amend the text of the international standard.

In **6.7**, line 4, after “(e.g.” insert “producing about”.

In **8.1**, in line 5 of the last paragraph delete “other ingredients” and substitute “sludge inoculum (6.7)”.

In **9.1**, in both definitions of symbol *n* after “gas” insert “in the given volume”.

NOTE *Typographical errors.* In Annex B, The title should read “cumulative” and not “cumulated”.

Cross references. The Technical Committee has reviewed the provisions of ISO 10634:1995 and of the draft of ISO/DIS 11923, to which normative reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN ISO title page, pages 2 to 16, an inside back cover and a back cover,

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

ICS 13.060.40

Descriptors: Water, quality, sewage, sewage treatment sludges, organic compounds, tests, water tests, determination, biodegradability

English version

Water quality — Evaluation of the “ultimate” anaerobic biodegradability of organic compounds in digested sludge — Method by measurement of the biogas production

(ISO 11734:1995)

Qualité de l'eau — Evaluation de la biodégradabilité anaérobie “ultime” des composés organiques dans les boues de digesteurs — Méthode par mesurage de la production de biogaz
(ISO 11734:1995)

Wasserbeschaffenheit — Bestimmung der vollständigen anaeroben biologischen Abbaubarkeit organischer Verbindungen im Faulschlamm — Verfahren durch Messung der Biogasproduktion
(ISO 11734:1995)

This European Standard was approved by CEN on 21 June 1998.

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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 Central Secretariat has the same status as the official versions.

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Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

The text of the International Standard from Technical Committee ISO/TC 147, Water quality, of the International Organization for Standardization (ISO) has been taken over as a European Standard by Technical Committee CEN/TC 230, Water analysis, the Secretariat of which is held by DIN.

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 January 1999, and conflicting national standards shall be withdrawn at the latest by January 1999.

According to CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 11734:1995 has been approved by CEN as a European Standard without any modification.

NOTE Normative references to International Standards are listed in Annex ZA (normative).

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

1 Scope

This International Standard specifies a screening method for the evaluation of the biodegradability of organic compounds at a given concentration by anaerobic microorganisms. The conditions described in this test do not necessarily correspond to the optimal conditions allowing the maximum value of biodegradation to occur, since a dilute sludge is used with a relatively high concentration of test chemical. The test allows exposure of sludge to the chemical for a period of up to 60 d, which is longer than the normal sludge retention time (25 d to 30 d) in anaerobic digesters, though digesters at industrial sites can have much longer retention times.

The method applies to organic compounds with a known carbon content and which are

- soluble in water;
- poorly soluble in water, provided that a method of exact dosing is applicable;
- not inhibitory to the test microorganisms at the concentration chosen for the test; inhibitory effects can be determined in separate tests or by an additional inhibition assay.

For volatile substances a case by case decision is necessary. Some can be tested if handled with special care, for example no release of gas during the test.

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 10634:1995, *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*.

ISO 11923:—, *Water quality — Determination of suspended solids by filtration through glass-fibre filters*¹⁾.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1

ultimate anaerobic biodegradation

the level of degradation achieved when a test compound is utilized by anaerobic microorganisms resulting in the production of carbon dioxide, methane, mineral salts and new microbial cellular constituents (biomass)

3.2

primary anaerobic biodegradation

the level of degradation achieved when a test compound undergoes any structural change, other than complete mineralization, as a result of anaerobic microbial action

3.3

digested sludge

a mixture of the settled phases of sewage and activated sludge, which have been incubated in an anaerobic digester at about 35 °C to reduce biomass and odour problems and to improve the dewaterability of the sludge. Digested sludge consists of an association of anaerobic fermentative and methanogenic bacteria producing carbon dioxide and methane

3.4

concentration of total solids

the amount of solids obtained by drying a known volume of sludge under specified conditions at about 105 °C to constant mass

¹⁾ To be published.