

INTERNATIONAL STANDARD

**ISO
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Second edition
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Water quality — Determination of biochemical oxygen demand after 5 days (BOD₅) — Dilution and seeding method

*Qualité de l'eau — Détermination de la demande biochimique en oxygène après
5 jours (DBO₅) — Méthode par dilution et ensemencement*



Reference number
ISO 5815 : 1989 (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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 5815 was prepared by Technical Committee ISO/TC 147, *Water quality*.

This second edition cancels and replaces the first edition (ISO 5815 : 1983), of which it constitutes a minor revision.

Annex A of this International Standard is for information only.

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Water quality — Determination of biochemical oxygen demand after 5 days (BOD₅) — Dilution and seeding method

1 Scope

This International Standard specifies a method for the empirical and conventional determination of the biochemical oxygen demand of waters by dilution and seeding.

The method is applicable to all waters having biochemical oxygen demands greater than or equal to 3 mg of oxygen per litre and not exceeding 6 000 mg of oxygen per litre. For biochemical oxygen demands greater than 6 000 mg of oxygen per litre, the method is still applicable, but the errors caused by the dilutions necessary require the results to be interpreted with circumspection.

The results obtained are the product of a combination of biochemical and chemical actions. They do not have the rigorous and unambiguous character of those resulting from, for example, a single, well-defined, chemical process. Nevertheless, they provide an indication from which the quality of waters can be estimated.

The test may be influenced by the presence of various substances. Those which are toxic to micro-organisms, for example bactericides, toxic metals or free chlorine, will inhibit biochemical oxidation. The presence of algae or nitrifying micro-organisms may produce artificially high results.

Annex A gives information on alternative incubation periods and temperatures.

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 5813 : 1983, *Water quality — Determination of dissolved oxygen — Iodometric method*.

ISO 5814 : 1984, *Water quality — Determination of dissolved oxygen — Electrochemical probe method*.

ISO 6107-2 : 1981, *Water quality — Vocabulary — Part 2*.

ISO 7393-1 : 1985, *Water quality — Determination of free chlorine and total chlorine — Part 1 : Titrimetric method using N,N-diethyl-1,4-phenylenediamine*.

ISO 7393-2 : 1985, *Water quality — Determination of free chlorine and total chlorine — Part 2 : Colorimetric method using N,N-diethyl-1,4-phenylenediamine, for routine control purposes*.

3 Definition

For the purposes of this International Standard, the following definition applies.

biochemical oxygen demand (BOD): The mass concentration of dissolved oxygen consumed under specified conditions by the biological oxidation of organic and/or inorganic matter in water. (Definition taken from ISO 6107-2.)

For the purpose of this International Standard, “biological oxidation” is taken to mean “biochemical oxidation”.

4 Principle

Neutralization of the sample of water to be analysed and dilution with varying amounts of a dilution water rich in dissolved oxygen and containing a seed of aerobic micro-organisms, with or without suppression of nitrification, as desired.

Incubation at a controlled temperature for a defined period, 5 days, in the dark, in a completely filled and stoppered bottle. Determination of the dissolved oxygen concentration before and after incubation. Calculation of the mass of oxygen consumed per litre of water.

Simultaneous performance of a check test on a standard solution of glucose and glutamic acid.

5 Reagents

During the analysis, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity (water distilled in an all-glass apparatus or demineralized water).