



SLOVENSKI STANDARD SIST EN ISO 5667-16:2017

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Nadomešča:

SIST EN ISO 5667-16:2000

**Kakovost vode - Vzorčenje - 16. del: Navodilo za biološko preskušanje vzorcev
(ISO 5667-16:2017)**

Water quality - Sampling - Part 16: Guidance on biotesting of samples (ISO 5667-16:2017)

Wasserbeschaffenheit - Probenahme - Teil 16: Anleitung zur Probenahme und Durchführung biologischer Testverfahren (ISO 5667-16:2017)

Qualité de l'eau - Échantillonnage - Partie 16: Lignes directrices pour les essais biologiques des échantillons (ISO 5667-16:2017)

Ta slovenski standard je istoveten z: EN ISO 5667-16:2017

ICS:

13.060.70	Preiskava bioloških lastnosti vode	Examination of biological properties of water
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EUROPEAN STANDARD

EN ISO 5667-16

NORME EUROPÉENNE

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Supersedes EN ISO 5667-16:1998

English Version

Water quality - Sampling - Part 16: Guidance on biotesting of samples (ISO 5667-16:2017)

Qualité de l'eau - Échantillonnage - Partie 16: Lignes
directrices pour les essais biologiques des échantillons
(ISO 5667-16:2017)

Wasserbeschaffenheit - Probenahme - Teil 16:
Anleitung zur Probenahme und Durchführung
biologischer Testverfahren (ISO 5667-16:2017)

This European Standard was approved by CEN on 9 February 2017.

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European foreword

This document (EN ISO 5667-16:2017) has been prepared by Technical Committee ISO/TC 147 “Water quality” in collaboration with 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of an identical text or by endorsement, at the latest by November 2017, and conflicting national standards shall be withdrawn at the latest by November 2017.

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Second edition
2017-04

**Water quality — Sampling —
Part 16:
Guidance on biotesting of samples**

Qualité de l'eau — Échantillonnage —

*Partie 16: Lignes directrices pour les essais biologiques des
échantillons*

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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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This document was prepared by ISO/TC 147, *Water quality*, Subcommittee SC 6, *Sampling (general methods)*.

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This second edition cancels and replaces the first edition (ISO 5667-16:1998), which has been technically revised.

A list of all parts in the ISO 5667 series can be found on the ISO website.

ISO 5667-16:2017(E)

Introduction

Biological tests are suitable for determining the effect of environmental samples or chemical substances on the respective test organism under the specific standardized test conditions. Environmental samples are e.g. treated communal and industrial waste water, fresh water, aqueous extracts of solid material (e.g. leachates, eluates), pore water of sediments. The effect can be stimulative or inhibiting, and can be determined by the reaction of the test organism (e.g. death, growth, morphological and physiological changes or generally, changes in molecular mechanisms of action). Inhibiting effects can be triggered by toxic water constituents or by other noxious influences.

The toxicity measurable in the biological test is the result of the interaction between a single toxic substance, a mixture of substances or the constituents of an environmental sample and the test organism. The protective potential of the biological system, i.e. the test organism, for instance by metabolic detoxification and excretion, is an integral part of the biological test.

Apart from the direct toxic effect of one or more sample constituents, biological effects can be exerted by the combined action of all constituents of a sample. Such a combined effect includes the impact of, for example, substances which are not toxic *per se* but affect the chemical or physical properties of the test batches by interfering with the test specific additives (e.g. nutrients, salts) and, consequently, the living conditions for the test organisms. This applies for instance to oxygen-depleting substances, coloured substances or turbid matter which reduce light exposure.

Biological tests also include those tests which examine the effect of organisms on substances (e.g. microbial degradation studies).

The results of the biological test refer primarily to the organism used in the test and the defined conditions stipulated for the test procedure. A harmful effect stated by means of standardized biological tests can justify concern that aquatic organisms and biocoenosis might be endangered. The results, however, do not permit direct or extrapolative conclusions as to the occurrence of similar effects in the aquatic environment. This applies in particular to suborganismic tests, as important properties and physiological functions of intact organisms (e.g. protective integuments, repair mechanisms) are removed or deactivated.

In principle there is no test organism which can be used to test all the effects on the biocoenosis or the ecosystem possible under the various combinations of abiotic and biotic conditions. Only a few ("model") species representing relevant ecological functions can be tested in practice.

Besides these fundamental and practical limitations in the selection of test organisms some issues should be taken into account during sampling and sample treatment in order to avoid a change in the sample properties. This applies to the method of sampling, including the sampling equipment and sample container as well as the transport to the laboratory. The method of sample pre-treatment and storage, as well as the preparation of, for example, stock solutions, may have an influence on the test result as well.

Furthermore, the sample to be tested can pose experimental problems on biotesting. Environmental samples (e.g. waste water, eluates) are complex mixtures and may contain, for example, sparingly soluble, volatile, unstable, coloured substances or suspended, sometimes colloidal, particles. The complexity and heterogeneity of materials give rise to a variety of experimental problems when performing biotests.

Special problems are related to the instability of the test material due to reactions and processes such as

- physical (e.g. phase separation, sedimentation, volatilization),
- chemical (e.g. hydrolysis, photodegradation, precipitation), and/or
- biological (e.g. biodegradation, biotransformation, biological uptake in organisms).

Other problems, especially if spectrometric measurements are applied, relate to turbidity and colour of the test batch.