



**SLOVENSKI STANDARD**  
**SIST EN ISO 8692:2005**

**01-februar-2005**

**BUXca Yý U**  
**SIST EN 28692:1998**

---

?U\_cj cghj cXY!`DfYg\_i g'nUj ]fUb`UfUgh]g`UX\_cj cXb]\ `U[ `n`YbcWV] b]a ]n`Yb]a ]  
U[ Ua ]fGC`, \*- &\$\$(\$ Ł

Water quality - Freshwater algal growth inhibition test with unicellular green algae (ISO 8692:2004)

Wasserbeschaffenheit - Süßwasseralgen-Wachstumshemmtest mit einzelligen Grünalgen (ISO 8692:2004)

Qualité de l'eau - Essai d'inhibition de la croissance des algues d'eau douce avec des algues vertes unicellulaires (ISO 8692:2004)

**Ta slovenski standard je istoveten z: EN ISO 8692:2004**

---

**ICS:**

13.060.70	Preiskava bioloških lastnosti vode	Examination of biological properties of water
-----------	------------------------------------	-----------------------------------------------

**SIST EN ISO 8692:2005**

**en,fr,de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 8692:2005](#)

<https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-2741ea87fb32/sist-en-iso-8692-2005>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN ISO 8692**

October 2004

ICS 13.060.70

Supersedes EN 28692:1993

English version

## Water quality - Freshwater algal growth inhibition test with unicellular green algae (ISO 8692:2004)

Qualité de l'eau - Essai d'inhibition de la croissance des algues d'eau douce avec des algues vertes unicellulaires (ISO 8692:2004)

Wasserbeschaffenheit - Süßwasseralgen-Wachstumshemmtest mit einzelligen Grünalgen (ISO 8692:2004)

This European Standard was approved by CEN on 13 September 2004.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

[SIST EN ISO 8692:2005](https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-2741ea87fb32/sist-en-iso-8692-2005)

<https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-2741ea87fb32/sist-en-iso-8692-2005>



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

**EN ISO 8692:2004 (E)****Foreword**

This document (EN ISO 8692:2004) 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 April 2005, and conflicting national standards shall be withdrawn at the latest by April 2005.

This document supersedes EN 28692:1993.

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

**Endorsement notice**

The text of ISO 8692:2004 has been approved by CEN as EN ISO 8692:2004 without any modifications.

**(standards.iteh.ai)**

[SIST EN ISO 8692:2005](https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-2741ea87fb32/sist-en-iso-8692-2005)

<https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-2741ea87fb32/sist-en-iso-8692-2005>

# INTERNATIONAL STANDARD

**ISO  
8692**

Second edition  
2004-10-01

---

---

## Water quality — Freshwater algal growth inhibition test with unicellular green algae

*Qualité de l'eau — Essai d'inhibition de la croissance des algues d'eau  
douce avec des algues vertes unicellulaires*

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 8692:2005](https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-2741ea87fb32/sist-en-iso-8692-2005)

[https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-  
2741ea87fb32/sist-en-iso-8692-2005](https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-2741ea87fb32/sist-en-iso-8692-2005)



Reference number  
ISO 8692:2004(E)

© ISO 2004

## ISO 8692:2004(E)

**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 8692:2005](https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-2741ea87fb32/sist-en-iso-8692-2005)

<https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-2741ea87fb32/sist-en-iso-8692-2005>

© ISO 2004

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

## Contents

Page

Foreword.....	iv
1 Scope.....	1
2 Normative references .....	1
3 Terms and definitions .....	1
4 Principle .....	2
5 Reagents and media .....	2
6 Apparatus.....	4
7 Procedure.....	5
8 Validity criteria .....	7
9 Calculation .....	8
10 Expression of results.....	9
11 Interpretation of results .....	9
12 Precision .....	9
13 Test report.....	10
Annex A (informative) Rapid screening of wastewater algal growth inhibition.....	12
Bibliography .....	15

iTeh STANDARD PREVIEW

(standards.iteh.ai)

SIST EN ISO 8692:2005

<https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-2741ea87fb32/sist-en-iso-8692-2005>

## ISO 8692:2004(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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 8692 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 5, *Biological methods*.

This second edition cancels and replaces the first edition (ISO 8692:1989), which has been technically revised.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 8692:2005](https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-2741ea87fb32/sist-en-iso-8692-2005)

<https://standards.iteh.ai/catalog/standards/sist/68bce05a-e0e7-40fc-8fbd-2741ea87fb32/sist-en-iso-8692-2005>



# Water quality — Freshwater algal growth inhibition test with unicellular green algae

**WARNING** — Persons using this International Standard should be familiar with normal laboratory practice. This International Standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

## 1 Scope

This International Standard specifies a method for the determination of the growth inhibition of unicellular green algae by substances and mixtures contained in water or by wastewater. This method is applicable for substances that are easily soluble in water.

With modifications to this method, as described in ISO 14442 and ISO 5667-16, the inhibitory effects of poorly soluble organic and inorganic materials, volatile compounds, heavy metals and waste water can be tested.

A rapid algal growth inhibition screening test for wastewater is included in Annex A.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5667-16:1998, *Water — Sampling — Part 16: Guidance on biotesting of samples*

ISO 14442:1999, *Water quality — Guidelines for algal growth inhibition tests with poorly soluble materials, volatile compounds, metals and waste water*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1 cell density

$x$   
number of cells per unit volume of medium

NOTE Cell density is expressed in cells per millilitre.

### 3.2 specific growth rate

$\mu$   
proportional rate of increase in cell density per unit of time:

$$\mu = \frac{1}{x} \frac{dx}{dt}$$

**ISO 8692:2004(E)**

where

$x$  is the cell density, expressed in cells per millilitre;

$t$  is the time, expressed in days

NOTE Specific growth rate is expressed in inverse days ( $\text{day}^{-1}$ ).

**3.3 growth medium**  
mixture of water and nutrients in which algal cells are incubated, which is used for pre-cultures and controls

**3.4 test sample**  
aqueous sample (e.g. wastewater), chemical substance or mixture for which the inhibitory effects on the growth of algae are determined

**3.5 test medium**  
mixture of water, nutrients and test sample

**3.6 test batch**  
mixture of water, nutrients and test sample (test medium 3.5), inoculated with algae

**3.7 control**  
mixture of water, nutrients (growth medium 3.3) without test sample, inoculated with algae

**3.8 effective concentration**  
 $E_r C_x$   
concentration of test sample which results in a reduction of  $x$  % in the specific growth rate relative to the controls

NOTE To unambiguously denote an EC value deriving from growth rate it is proposed to use the symbol " $E_r C$ ".

## 4 Principle

Monospecies algal strains are cultured for several generations in a defined medium containing a range of concentrations of the test sample, prepared by mixing appropriate quantities of growth medium, test sample and an inoculum of exponentially growing algal cells. The test batches are incubated for a period of  $(72 \pm 2)$  h during which the cell density in each test solution is measured at least every 24 h.

Inhibition is measured as a reduction in growth rate, relative to control cultures grown under identical conditions.

## 5 Reagents and media

**5.1 Test organism**, using either of the following planktonic fresh water algae species:

- a) *Desmodesmus subspicatus*<sup>1)</sup> (86.81 SAG).
- b) *Pseudokirchneriella subcapitata* (Korshikov) Hindak<sup>2)</sup> (ATCC 22662, CCAP 278/4 or 61.81 SAG).

---

1) This species is formerly known as *Scenedesmus subspicatus* Chodat.

NOTE 1 Both algae species are planktonic green algae belonging to the order of *Chlorococcales* (*Chlorophyta*, *Chlorophyceae*), and are usually unicellular in culture.

The strains recommended are available in unialgal, non-axenic cultures from the following collections<sup>3)</sup>.

— SAG: Collection of Algal Cultures  
Inst. Plant Physiology  
University of Göttingen  
Nikolausberger Weg 18  
D-37073 Göttingen  
Germany

— ATCC: American Type Culture Collection  
12301 Parklane Drive  
Rockville  
Maryland 20852  
USA

— CCAP: Culture Centre of Algae and Protozoa  
Freshwater Biological Association  
The Ferry House  
Ambleside  
Cumbria LA22 0LP  
United Kingdom

Algothèque du laboratoire de cryptogamie  
Muséum National d'Histoire Naturelle  
12, rue Buffon  
75005 Paris  
France

NOTE 2 Stock cultures can be maintained in the medium described in 5.3. and 7.1. However, a frequent sub-culturing is necessary (once a week) to prevent failure of growth. The stock culture can be maintained for extended periods on richer algal media such as those recommended by the culture collection.

Alternatively algae can be stored for several months in alginate beads<sup>4)</sup>, without losing their viability<sup>[1]</sup>. The algae can be easily liberated from the algal beads when needed to perform the toxicity tests.

**5.2 Water**, deionized or of equivalent purity (conductivity < 10 µS/cm), for use in the preparation of the growth medium and test substance solutions.

Take special care to avoid contamination of the water by inorganic or organic substances during preparation and storage. Equipment made of copper shall not be used.

2) This species is formerly known as *Selenastrum capricornutum* Prinz. The new name is currently cited by culture collections.

3) Trade name of strains are examples of suitable strains available commercially. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of these products.

4) The algae beads supplied by MICROBIOTESTS Inc., Venecoweg 19, 9810 Nazareth, Belgium. Tel. (32) 9 380 8545, fax (32) 9 380 8546, e-mail [microbiotests@skynet.be](mailto:microbiotests@skynet.be), are an example of a suitable commercially available product. This information is given for the convenience of users of this International Standard and does not constitute an endorsement by ISO of this product. Equivalent products may be used if they can be shown to lead to the same results.