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**Kakovost vode - Določevanje učinka odpadne vode, naravne vode in kemikalij na zaviranje rasti vodne leče *Spirodela polyrhiza* - Metoda z neodvisnim mikrobiološkim preskusom z založno kulturo (ISO 20227:2017)**

Water quality - Determination of the growth inhibition effects of waste waters, natural waters and chemicals on the duckweed *Spirodela polyrhiza* - Method using a stock culture independent microbiotest (ISO 20227:2017)

Wasserbeschaffenheit - Bestimmung der wachstumshemmenden Wirkung von Abwässern, natürlichen Wässern und Chemikalien auf die Wasserlinsenart *Spirodela polyrhiza* - Verfahren mittels Stammkultur unabhängigem mikrobiologischem Test (ISO 20227:2017)

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Qualité de l'eau - Détermination des effets d'inhibition sur la croissance de la lentille d'eau *Spirodela polyrhiza* par les eaux usées, les eaux naturelles et les produits chimiques - Méthode utilisant un bioessai miniaturisé indépendant d'une culture mère (ISO 20227:2017)

**Ta slovenski standard je istoveten z: EN ISO 20227:2017**

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**ICS:**

07.100.20	Mikrobiologija vode	Microbiology of water
13.060.70	Preiskava bioloških lastnosti vode	Examination of biological properties of water

**SIST EN ISO 20227:2017**

**en,fr,de**

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EUROPEAN STANDARD

EN ISO 20227

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2017

ICS 13.060.70

English Version

## Water quality - Determination of the growth inhibition effects of waste waters, natural waters and chemicals on the duckweed *Spirodela polyrhiza* - Method using a stock culture independent microbiotest (ISO 20227:2017)

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## European foreword

This document (EN ISO 20227:2017) 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of an identical text or by endorsement, at the latest by January 2018 and conflicting national standards shall be withdrawn at the latest by January 2018.

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INTERNATIONAL  
STANDARDISO  
20227First edition  
2017-06

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**Water quality — Determination of  
the growth inhibition effects of waste  
waters, natural waters and chemicals  
on the duckweed *Spirodela polyrhiza*  
— Method using a stock culture  
independent microbiotest**

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Reference number  
ISO 20227:2017(E)

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## ISO 20227:2017(E)

### Foreword

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

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## Introduction

Duckweeds are free-floating higher water plants commonly used in ecotoxicological research for the assessment of the toxicity of waste waters, natural waters and chemicals (see ISO 20079 and References [6] to [11] and in particular plant protection products, see Reference [12]).

Duckweeds are fast growing plants, many of which have a cosmopolitan distribution, and they are, hence, well suited as primary producers for hazard assessment of pollutants in freshwater environments.

Contrary to terrestrial plants, for which bioassays can be started from the “dormant” life stages (seeds), toxicity tests with duckweeds require continuous culturing and maintenance of live stocks, with the inherent biological, technical and financial costs.

A few duckweed species, however, produce dormant vegetative buds (turions) which can be stored for long periods of time, and which can be germinated on demand at the time of performance of the bioassay.

One of the duckweeds producing turions is *Spirodela polyrhiza*, and this species was eventually selected for a simple and practical microbiotest which is independent of the stock culturing and maintenance of live stocks.

*Spirodela polyrhiza* was found to be as sensitive to toxicants as the conventional bioassays with duckweeds.

The microbiotest procedure for this document involves a 3 d germination of the turions, followed by a 3 d toxicity test in a multiwell test plate, with determination of the growth inhibition of the first fronds via image analysis.

The *Spirodela polyrhiza* microbiotest is very simple and easy to perform:

- a) the assay does not require culturing or maintenance of live stocks of the test species, and can be performed “anytime, anywhere” by the use of stored turions;
- b) stored turions have a shelf life of several months with a high germination success;
- c) the microbiotest requires minimal bench and incubation space, and minimal equipment;
- d) the area measurements of the first fronds do not need to be made immediately and can be postponed to an appropriate timing;
- e) the area measurements by image analysis are very rapid and precise, and take less than 1 h for a complete test.

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