



BSI Standards Publication

**Water quality — Larval
development test with the
harpacticoid copepod *Nitocra
spinipes***

National foreword

This Published Document is the UK implementation of ISO/TS 18220:2016.

The UK participation in its preparation was entrusted to Technical Committee EH/3/5, Biological Methods.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2016.
Published by BSI Standards Limited 2016

ISBN 978 0 580 82028 1

ICS 13.060.70

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 June 2016.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

**Water quality — Larval development
test with the harpacticoid copepod
*Nitocra spinipes***

*Qualité de l'eau — Essai de développement larvaire avec le
copépode harpacticoïde Nitocra spinipes*





COPYRIGHT PROTECTED DOCUMENT

© ISO 2016. Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Terms and definitions	1
3 Principle	2
4 Reagents	2
5 Cultivation	3
5.1 Test organism.....	3
5.2 Algae for feeding.....	3
6 Apparatus	3
7 Procedure	4
7.1 Production of nauplii to be used in test.....	4
7.2 Choice of test concentrations.....	4
7.2.1 Hypothesis testing.....	5
7.2.2 Regression analysis.....	5
7.3 Preparation of solutions to be used in test.....	5
7.3.1 Stock solution.....	5
7.3.2 Test solutions.....	5
7.4 Start of test.....	6
7.5 Incubation/exposure.....	6
7.6 Maintenance.....	6
7.7 Measurements/observations.....	6
7.7.1 Mortality.....	6
7.7.2 Larval development ratio (LDR).....	7
7.7.3 Physical-chemical parameters — oxygen, pH and salinity.....	7
7.7.4 Concentration of the test substance.....	7
8 Validity criteria	7
9 Evaluation of results	8
9.1 Calculation of results.....	8
9.2 Expression of results.....	8
9.3 Interpretation of results.....	8
10 Reproducibility	8
11 Test report	8
Annex A (informative) biology and cultivation of <i>Nitocra spinipes</i>	10
Annex B (informative) <i>Nitocra spinipes</i> larval development ratio	15
Annex C (informative) Calculations	17
Bibliography	19

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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 147, *Water quality*, Subcommittee SC 5, *Biological methods*.

Introduction

Harpacticoid copepods are predominantly benthic, occurring widely in marine, brackish and fresh water ecosystems. They represent important prey items for the benthic larvae of many fish species and larger invertebrates and constitute an ecologically important energy-transfer link between the organic phase of the sediment and higher trophic levels.

The euryhaline brackish water harpacticoid *Nitocra spinipes* (Crustacea) is a common component of the benthic meiofauna in shallow coastal waters around the world (see Reference [6]).

Currently in preview, click buy full version

Currently in preview, click buy full version

Water quality — Larval development test with the harpacticoid copepod *Nitocra spinipes*

WARNING — Persons using this Technical Specification should be familiar with normal laboratory practice. This Technical Specification 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.

IMPORTANT — It is absolutely essential that tests conducted in accordance with this Technical Specification be carried out by suitably qualified staff.

1 Scope

This Technical Specification specifies an early-life stage procedure for determination of the toxic effects of chemicals and water samples on a cold-water brackish water copepod species under semi-static conditions. The biological test variables include survival and development of the early-life stages. The exposure starts with newly hatched (<24 h) nauplii (larvae) and is continued until emergence of (c. 50 %) copepodites (juveniles) in the control.

The benthic living *Nitocra* complements the planktonic *Acartia* species in ISO 16778. These organisms represent different life-history strategies as *Nitocra* is egg-eating, whereas *Acartia* is a broadcasting calanoid copepod and thus, different sensitivities of specific life stages. *Nitocra* is a fresh to brackish water species, which allows testing low salinity waters and is complementary to *A. tonsa*, which is of marine origin and poorly tolerates low salinities.

2 Terms and definitions

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

2.1

nauplii
larvae

2.2

copepodites
juveniles

2.3

larval development ratio
LDR

ratio of *copepodites* (2.2) to the total number of surviving early-life stages (nauplii + copepodites) at the end of the test

2.4

lowest observed effect concentration
LOEC

lowest concentration within the experimental range at which a significant effect is observed

2.5

no observed effect concentration
NOEC

tested concentration just below the LOEC (2.4)