

VEE KVALITEET. HÄGUSUSE MÄÄRAMINE. OSA 1:  
KVANTITATIIVSED MEETODID

Water quality - Determination of turbidity - Part 1:  
Quantitative methods (ISO 7027-1:2016)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 7027-1:2016 sisaldab Euroopa standardi EN ISO 7027-1:2016 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 7027-1:2016 consists of the English text of the European standard EN ISO 7027-1:2016.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 29.06.2016.	Date of Availability of the European standard is 29.06.2016.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile [standardiosakond@evs.ee](mailto:standardiosakond@evs.ee).

ICS 13.060.60

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Koduleht [www.evs.ee](http://www.evs.ee); telefon 605 5050; e-post [info@evs.ee](mailto:info@evs.ee)

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage [www.evs.ee](http://www.evs.ee); phone +372 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

English Version

Water quality - Determination of turbidity - Part 1:  
Quantitative methods (ISO 7027-1:2016)

Qualité de l'eau - Détermination de la turbidité - Partie  
1: Méthodes quantitatives (ISO 7027-1:2016)

Wasserbeschaffenheit - Bestimmung der Trübung - Teil  
1: Quantitative Verfahren (ISO 7027-1:2016)

This European Standard was approved by CEN on 15 April 2016.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

## European foreword

This document (EN ISO 7027-1:2016) 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 December 2016, and conflicting national standards shall be withdrawn at the latest by December 2016.

This document supersedes EN ISO 7027:1999.

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

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

### Endorsement notice

The text of ISO 7027-1:2016 has been approved by CEN as EN ISO 7027-1:2016 without any modification.

# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Sampling and samples</b> .....	<b>2</b>
<b>5 Quantitative methods of turbidity measurement using optical nephelometers and turbidimeters</b> .....	<b>2</b>
5.1 General principles.....	2
5.2 Reagents.....	3
5.3 Measurement of diffuse radiation (nephelometry).....	5
5.3.1 Apparatus.....	5
5.3.2 Calibration.....	5
5.3.3 Procedure.....	5
5.3.4 Expression of results.....	5
5.3.5 Test report.....	5
5.4 Measurement of attenuated radiation (turbidimetry).....	5
5.4.1 Apparatus.....	5
5.4.2 Calibration.....	6
5.4.3 Procedure.....	6
5.4.4 Expression of results.....	6
5.4.5 Test report.....	6
<b>Annex A (informative) Results of an interlaboratory collaborative trial to evaluate the suitability of a synthetic polymer for use as a secondary standard to formazin in turbidity measurements</b> .....	<b>7</b>
<b>Bibliography</b> .....	<b>9</b>

## 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](http://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](http://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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 147, *Water quality*, Subcommittee SC 2, *Physical, chemical and biochemical methods*.

This first edition of ISO 7027-1, together with ISO 7027-2, cancels and replaces ISO 7027:1999, which has been technically revised.

ISO 7027 consists of the following parts, under the general title *Water quality — Determination of turbidity*:

— *Part 1: Quantitative methods*

The following part is under preparation:

— *Part 2: Semi-quantitative methods*

## Introduction

Measurements of turbidity can be affected by the presence of dissolved light-absorbing substances (substances imparting colour). Such effects can be minimized, however, by performing measurements at wavelengths greater than 800 nm. Only carbon black and a blue colour, which can be found in certain polluted waters, slightly affects measurements of turbidity in this region of the spectrum. Air bubbles can also interfere with measurements, but such interference can be minimized by careful handling of the samples.

It is to be investigated whether and to what extent, particular problems will require the specification of additional marginal conditions.

# Water quality — Determination of turbidity —

## Part 1: Quantitative methods

**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.

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

### 1 Scope

This part of ISO 7027 specifies two quantitative methods using optical turbidimeters or nephelometers for the determination of turbidity of water:

- a) nephelometry, procedure for measurement of diffuse radiation, applicable to water of low turbidity (for example drinking water);
- b) turbidimetry, procedure for measurement of the attenuation of a radiant flux, more applicable to highly turbid waters (for example waste waters or other cloudy waters).

Turbidities measured according to the first method are presented as nephelometric turbidity units (NTU). The results typically range between <0,05 NTU and 400 NTU. Depending on the instrument design, it can also be applicable to waters of higher turbidity. There is numerical equivalence of the units NTU and formazin nephelometric unit (FNU).

Turbidity measured by the second method is expressed in formazin attenuation units (FAU), results typically range between 40 FAU and 4 000 FAU.

### 2 Normative references

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

CIE Publication No. 17, *International Lighting Vocabulary*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in CIE Publication No. 17 and the following apply.

#### 3.1

##### **turbidity**

reduction of transparency of a liquid caused by the presence of undissolved matter