

Medición de la radiactividad. Determinación de las actividades de los emisores beta. Método de ensayo mediante recuento de centelleo de líquidos (ISO 19361:2017) (Ratificada por la Asociación Española de Normalización en abril de 2020.)

UNE-EN ISO 19361:2020

Medición de la radiactividad. Determinación de las actividades de los emisores beta. Método de ensayo mediante recuento de centelleo de líquidos (ISO 19361:2017) (Ratificada por la Asociación Española de Normalización en abril de 2020.)

*Measurement of radioactivity - Determination of beta emitters activities - Test method using liquid scintillation counting (ISO 19361:2017) (Endorsed by Asociación Española de Normalización in April of 2020.)*

*Mesurage de la radioactivité - Détermination de l'activité des radionucléides émetteurs bêta - Méthode d'essai par comptage des scintillations en milieu liquide (ISO 19361:2017) (Entérinée par l'Asociación Española de Normalización en avril 2020.)*

En cumplimiento del punto 11.2.5.4 de las Reglas Internas de CEN/CENELEC Parte 2, se ha otorgado el rango de documento normativo español UNE al documento normativo europeo EN ISO 19361:2020 (Fecha de disponibilidad 2020-02-26)

Este documento está disponible en los idiomas oficiales de CEN/CENELEC/ETSI.

Este anuncio causará efecto a partir del primer día del mes siguiente al de su publicación en la revista UNE.

La correspondiente versión oficial de este documento se encuentra disponible en la Asociación Española de Normalización (Génova 6 28004 MADRID, [www.une.org](http://www.une.org)).

Las observaciones a este documento han de dirigirse a:

## Asociación Española de Normalización

Génova, 6  
28004 MADRID-España  
Tel.: 915 294 900  
[info@une.org](mailto:info@une.org)  
[www.une.org](http://www.une.org)

© UNE 2020

Prohibida la reproducción sin el consentimiento de UNE.

Todos los derechos de propiedad intelectual de la presente norma son titularidad de UNE.

EUROPEAN STANDARD

**EN ISO 19361**

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2020

ICS 17.240

English Version

## Measurement of radioactivity - Determination of beta emitters activities - Test method using liquid scintillation counting (ISO 19361:2017)

Mesurage de la radioactivité - Détermination de l'activité des radionucléides émetteurs bêta - Méthode d'essai par comptage des scintillations en milieu liquide (ISO 19361:2017)

Nachweis der Radioaktivität - Bestimmung der Aktivität von Betastrahlern - Verfahren mit Flüssigszintillationszählung (ISO 19361:2017)

This European Standard was approved by CEN on 7 January 2020.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, 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: Rue de la Science 23, B-1040 Brussels**

**Contents**

Page

**European foreword..... 3**

## European foreword

The text of ISO 19361:2017 has been prepared by Technical Committee ISO/TC 85 "Nuclear energy, nuclear technologies, and radiological protection" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 19361:2020 by Technical Committee CEN/TC 430 "Nuclear energy, nuclear technologies, and radiological protection" the secretariat of which is held by AFNOR.

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 August 2020, and conflicting national standards shall be withdrawn at the latest by August 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Endorsement notice

The text of ISO 19361:2017 has been approved by CEN as EN ISO 19361:2020 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 Normatives references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Symbols, abbreviations and units</b> .....	<b>2</b>
<b>5 Principle</b> .....	<b>2</b>
<b>6 Reagents and equipment</b> .....	<b>3</b>
6.1 Reagents.....	3
6.1.1 Blank material.....	3
6.1.2 Calibration source solutions.....	3
6.1.3 Scintillation solution.....	4
6.1.4 Quenching agent.....	4
6.2 Equipment.....	4
6.2.1 General.....	4
6.2.2 Liquid scintillation counter.....	4
6.2.3 Counting vials.....	5
<b>7 Sampling and samples</b> .....	<b>5</b>
7.1 Sampling.....	5
7.2 Sample storage.....	5
<b>8 Procedure</b> .....	<b>5</b>
8.1 Determination of background.....	5
8.2 Determination of detection efficiency.....	6
8.3 Quench correction.....	6
8.4 Sample preparation.....	7
8.5 Preparation of the scintillation sources to be measured.....	7
8.6 Counting procedure.....	7
8.6.1 Control and calibration.....	7
8.6.2 Measurement conditions.....	7
8.6.3 Interference control.....	8
<b>9 Expression of results</b> .....	<b>9</b>
9.1 General.....	9
9.2 Calculation of activity concentration, without preparation.....	9
9.3 Decision threshold, without preparation.....	10
9.4 Detection limit, without preparation.....	10
9.5 Confidence interval limits, without preparation.....	10
9.6 Calculations using the activity per unit of mass, without preparation.....	11
<b>10 Test report</b> .....	<b>11</b>
<b>Annex A (informative) Internal standard method</b> .....	<b>12</b>
<b>Annex B (informative) TDCR Liquid Scintillation Counting</b> .....	<b>14</b>
<b>Annex C (informative) Cerenkov measurement with LSC and TDCR counter</b> .....	<b>17</b>
<b>Bibliography</b> .....	<b>19</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 voluntary nature of standards, 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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 85, *Nuclear energy, nuclear technologies, and radiological protection*, Subcommittee SC 2, *Radiological protection*.