# TECHNICAL REPORT RAPPORT TECHNIQUE TECHNISCHER BERICHT

**CEN ISO/TR 22930-1** 

August 2021

ICS 13.280

#### **English Version**

## Evaluating the performance of continuous air monitors - Part 1: Air monitors based on accumulation sampling techniques (ISO/TR 22930-1:2020)

Évaluation des performances des dispositifs de surveillance de l'air en continu - Partie 1: Dispositifs de surveillance de l'air basés sur des techniques de prélèvement avec accumulation (ISO/TR 22930-1:2020) Ermittlung der Leistungsfähigkeit kontinuierlicher Luftmonitore - Teil 1: Luftmonitore basierend auf Sammeltechnik mittels Anreicherung (ISO/TR 22930-1:2020)

This Technical Report was approved by CEN on 16 August 2021. It has been drawn up by the Technical Committee CEN/TC 430.

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/TR 22930-1:2020 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 CEN ISO/TR 22930-1:2021 by Technical Committee CEN/TC 430 "Nuclear energy, nuclear technologies, and radiological protection" the secretariat of which is held by AFNOR.

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.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

#### **Endorsement notice**

The text of ISO/TR 22930-1:2020 has been approved by CEN as CEN ISO/TR 22930-1:2021 without any modification.

### TECHNICAL REPORT

ISO/TR 22930-1

First edition 2020-05

### **Evaluating the performance of continuous air monitors** —

### Part 1:

### Air monitors based on accumulation sampling techniques

Évaluation de la performance des dispositifs de surveillance de l'air en continu —

Partie 1: Moniteurs d'air basés sur des techniques d'échantillonnage par accumulation





### **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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 CP 401 • Ch. de Blandonnet 8 CH-1214 Vernier, Geneva Phone: +41 22 749 01 11 Fax: +41 22 749 09 47 Email: copyright@iso.org

Website: www.iso.org Published in Switzerland

Coı	ntent	S	Page
Fore	word		iv
Intro	oductio	n	<b>v</b>
1	Scon	e	1
2	_	native references	
3		is and definitions	
4	Symbols		
5	Meas	suring principle	6
6	Fixed	l-media filter monitor	
	6.1	Preliminary note	
	6.2	Study of the dynamic behaviour	
		6.2.1 General	
		6.2.2 Short half-life model of evaluation of the activity concentration	8 1 1
		<ul> <li>6.2.3 Long half-life radionuclide activity concentration model of evaluation</li> <li>6.2.4 Intermediate half-life radionuclide activity concentration model of evaluation</li> </ul>	
		6.2.5 Comparison of the three fixed filter models of evaluation	
_	34	•	
7	7.1	ng filter monitor Preliminary note	
	7.1	Study of the dynamic behaviour	
	7.3	Activity concentration model of evaluation	
8		uation of the characteristic limits	
O	8.1	General	
	8.2	Fixed media filter model of evaluation	
	0.2	8.2.1 General	
		8.2.2 Definition of the model	
		8.2.3 Standard uncertainty	
		8.2.4 Decision threshold	
		8.2.5 Detection limit	
	0.0	8.2.6 Limits of the coverage interval	
	8.3	Moving filter model of evaluation 8.3.1 Definition of the measurand	
		8.3.1 Definition of the measurand 8.3.2 Standard uncertainty	
		8.3.3 Decision threshold	
		8.3.4 Detection limit	
		8.3.5 Limits of the coverage interval	
9	Alar	ms setup, minimum detectable activity concentration and PME	29
		formative) Numerical example of gross beta emitting activity concentration	
7 11111		surement on fixed filter	32
Ann	<b>ex B</b> (in	formative) Numerical example of gross alpha emitting activity concentration	
	mea	surement on moving filter	37
Ann		formative) Numerical example of iodine 131 activity concentration gamma	
	spec	trometry measurement on fixed charcoal cartridge	41
Ann		formative) Determination of the detectable activity concentration and its	
	asso	ciated response time by the use a linear regression and statistical test method	44
Bibli	iograph	ıy	52

### 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 <a href="www.iso.org/directives">www.iso.org/directives</a>).

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 <a href="https://www.iso.org/patents">www.iso.org/patents</a>).

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: <a href="https://www.iso.org/iso/foreword.html">www.iso.org/iso/foreword.html</a>.

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

A list of all the parts in the ISO/TR 22930 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at <a href="https://www.iso.org/members.html">www.iso.org/members.html</a>.