

SLOVENSKI STANDARD SIST EN 62321-4:2014

01-junij-2014

Nadomešča:

SIST EN 62321:2009

Določevanje posameznih snovi v elektrotehničnih izdelkih - 4. del: Določevanje živega srebra v polimerih, kovinah in elektroniki s CV-AAS, CV-AFS, ICP-OES in ICP-MS (IEC 62321-4:2013)

Determination of certain substances in electrotechnical products - Part 4: Determination of mercury in polymers, metals and electronics by CV-AAS, CV-AFS, ICP-OES and ICP-MS

iTeh STANDARD PREVIEW

Verfahren zur Bestimmung von bestimmten Substanzen in Produkten der Elektrotechnik - Teil 4: Bestimmung von Quecksilber in Polymeren, Metallen und Elektronik mit CV-AAS, CV-AFS, ICP-OES und ICP-MSISTEN 62321-4:2014

67d1 adb7528e/sist-en-62321-4-2014

Détermination de certaines substances dans les produits électrotechniques - Partie 4: Détermination du mercure dans les polymères, métaux et produits électroniques part CV -AAS, CV-AFS, ICP-OES et ICP-MS

Ta slovenski standard je istoveten z: EN 62321-4:2014

ICS:

29.020 Elektrotehnika na splošno Electrical engineering in

general

31.020 Elektronske komponente na

Electronic components in

splošno

general

SIST EN 62321-4:2014

en

SIST EN 62321-4:2014

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 62321-4:2014

 $\frac{1}{12} https://standards.iteh.ai/catalog/standards/sist/8eb9fe48-f9ad-4396-bb20-67d1adb7528e/sist-en-62321-4-2014$

EUROPEAN STANDARD

EN 62321-4

NORME EUROPÉENNE EUROPÄISCHE NORM

April 2014

ICS 13.020; 43.040.10

Supersedes EN 62321:2009 (partially)

English version

Determination of certain substances in electrotechnical products - Part 4: Mercury in polymers, metals and electronics by CV-AAS, CV-AFS, ICP-OES and ICP-MS

(IEC 62321-4:2013)

Détermination de certaines substances dans les produits électrotechniques - Partie 4: Mercure dans les polymères, métaux et produits électroniques par CV-AAS, CV-AFS, ICP-OES et ICP-MS (CFI 62321-4:2013)

Verfahren zur Bestimmung von bestimmten Substanzen in Produkten der Elektrotechnik -

Teil 4: Quecksilber in Polymeren, Metallen und Elektronik mit CV-AAS, CV-AFS, ICP-OES und ICP-MS

(CEI 62321-4:2013) OES und ICP-MS (IEC 62321-4:2013)

(standards.iteh.ai)

This European Standard was approved by CENELEC on 2013-11-15. CENELEC 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 alternation. 62321-4-2014

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 CENELEC 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 CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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

CENELEC

European Committee for Electrotechnical Standardization Comité Européen de Normalisation Electrotechnique Europäisches Komitee für Elektrotechnische Normung

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

Foreword

The text of document 111/299/FDIS, future edition 1 of IEC 62321-4, prepared by IEC/TC 111 "Environmental standardization for electrical and electronic products and systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62321-4:2014.

(dop)

The following dates are fixed:

 latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement

2014-10-25

 latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-11-15

EN 62321-4:2014 is a partial replacement of EN 62321:2009, forming a structural revision and replacing Clause 7 and Annex E.

Future parts in the EN 62321 series will gradually replace the corresponding clauses in EN 62321:2009. Until such time as all parts are published, however, EN 62321:2009 remains valid for those clauses not yet re-published as a separate part.

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

SIST EN 62321-4:2014 https://standards.iteh.a Endogrammens/notice/pad-4396-bb20-67d1adb7528e/sist-en-62321-4-2014

The text of the International Standard IEC 62321-4:2013 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 62321-5 NOTE Harmonised as EN 62321-5.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	EN/HD	<u>Year</u>
IEC 62321-1	-	Determination of certain substances in electrotechnical products - Part 1: Introduction and overview	EN 62321-1	-
IEC 62321-2	-	Determination of certain substances in electrotechnical products - Part 2: Disassembly, disjunction and mechanical sample preparation	EN 62321-2	-
IEC 62321-3-1	iT	Determination of certain substances in electrotechnical products - Part 3-1: Screening electrotechnical products for lead, mercury, cadmium, total chromium and total bromine using X-ray Fluorescence Spectrometry	EN 62321-3-1	-
IEC 62554	-	Sample preparation for measurement of mercury level in fluorescent lamps	EN 62554	-
ISO 3696	https://sta		6-EN ISO 3696	-

SIST EN 62321-4:2014

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 62321-4:2014

 $\frac{1}{12} https://standards.iteh.ai/catalog/standards/sist/8eb9fe48-f9ad-4396-bb20-67d1adb7528e/sist-en-62321-4-2014$



IEC 62321-4

Edition 1.0 2013-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Determination of certain substances in electrotechnical products – Part 4: Mercury in polymers, metals and electronics by CV-AAS, CV-AFS, ICP-OES and ICP-MS

SIST EN 62321-4:2014

Détermination de certaines substances dans les produits électrotechniques – Partie 4: Mercure dans les polymères, métaux et produits électroniques par CV-AAS, CV-AFS, ICP-OES et ICP-MS

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX



ICS 13.020; 43.040.10

ISBN 978-2-83220-841-0

Warning! Make sure that you obtained this publication from an authorized distributor.

Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

CONTENTS

FOI	REWC)RD	4	
INT	RODU	JCTION	6	
1	Scop	e	7	
2	Norm	ative references	7	
3	Terms, definitions and abbreviations			
	3.1	Terms and definitions	8	
	3.2	Abbreviations		
4	Reag	ent and materials	9	
	4.1	General	9	
	4.2	Reagents	9	
	4.3	Materials	11	
5	Appa	ratus	11	
	5.1	General	11	
	5.2	Apparatus	11	
6	Samp	oling and test portion	12	
7	Proce	edure	12	
	7.1	Wet digestion (digestion of electronics)	12	
	7.2	Wet digestion (digestion of electronics)	13	
	7.3	Thermal decomposition gold amalgamation system.)	13	
	7.4	Preparation of reagent blank solution		
8	Calib	ration	14	
	8.1	General .https://standards.iteh.ai/catalog/standards/sist/8eb9fe48-f9ad-4396-bb20-67d1adb7528e/sist-en-62321-4-2014 Development of the calibration curve	14	
	8.2	Development of the calibration curve	14	
	8.3	Measurement of the sample		
9	Calcu	ılation	15	
10	Preci	sion	16	
11	Quali	ty assurance and control	16	
	11.1	General	16	
	11.2	Limits of detection (LOD) and limits of quantification (LOQ)		
Ann		informative) Practical application of determination of mercury in polymers,		
met	tals ar	d electronics by CV-AAS, AFS, ICP-OES and ICP-MS	19	
	•	informative) Results of international interlaboratory study Nos. 2 (IIS2) and		
	•	A)		
Bib	liogra	bhy	25	
		1 – Heating digester equipped with reaction vessel, reflux cooler and n vessel	19	
Fig	ure A.	2 – Configuration of equipment with AAS (example)	20	
-		3 – Mercury collecting tube (example)		
_		4 – Configuration (example) of the thermal decomposition/atomic absorption		
		eter for CCFL	22	
		Repeatability and reproducibility		
Tab	le 2 –	Acceptance criteria of items for the quality control	17	

Table 3 – Method detection limit = $t \times s_{n-1}$	18
Table A.1 – Program for microwave digestion (example) of samples (power output for five vessels)	20
Table B.1 – Statistical data for TD(G)-AAS	24
Table B.2 – Statistical data for CV-AAS	24
Table B.3 – Statistical data for CV-AFS	24
Table B.4 – Statistical data for ICP-OES	24

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 62321-4:2014 https://standards.iteh.ai/catalog/standards/sist/8eb9fe48-f9ad-4396-bb20-67d1adb7528e/sist-en-62321-4-2014

INTERNATIONAL ELECTROTECHNICAL COMMISSION

DETERMINATION OF CERTAIN SUBSTANCES IN ELECTROTECHNICAL PRODUCTS –

Part 4: Mercury in polymers, metals and electronics by CV-AAS, CV-AFS, ICP-OES and ICP-MS

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international
 consensus of opinion on the relevant subjects since each technical committee has representation from all
 interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.

 67d1adb7528e/sist-en-62321-4-2014
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62321-4 has been prepared by IEC technical committee 111: Environmental standardization for electrical and electronic products and systems.

The first edition of IEC 62321:2008 was a 'stand alone' standard that included an Introduction, an overview of test methods, a mechanical sample preparation as well as various test method clauses.

This first edition of IEC 62321-4 is a partial replacement of IEC 62321, forming a structural revision and replacing Clause 7 and Annex E.

Future parts in the IEC 62321 series will gradually replace the corresponding clauses in IEC 62321:2008. Until such time as all parts are published, however, IEC 62321:2008 remains valid for those clauses not yet re-published as a separate part.

62321-4 © IEC:2013

- 5 -

The text of this standard is based on the following documents:

FDIS	Report on voting
111/299/FDIS	111/309/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62321 series can be found on the IEC website under the general title: Determination of certain substances in electrotechnical products

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- · reconfirmed.
- · withdrawn,
- replaced by a revised edition, or
- amended.

iTeh STANDARD PREVIEW (standards.iteh.ai)

<u>SIST EN 62321-4:2014</u> https://standards.iteh.ai/catalog/standards/sist/8eb9fe48-f9ad-4396-bb20-67d1adb7528e/sist-en-62321-4-2014

62321-4 © IEC:2013

- 6 **-**

INTRODUCTION

The widespread use of electrotechnical products has drawn increased attention to their impact on the environment. In many countries this has resulted in the adaptation of regulations affecting wastes, substances and energy use of electrotechnical products.

The use of certain substances (e.g. lead (Pb), cadmium (Cd) and polybrominated diphenyl ethers (PBDEs)) in electrotechnical products, is a source of concern in current and proposed regional legislation.

The purpose of the IEC 62321 series is therefore to provide test methods that will allow the electrotechnical industry to determine the levels of certain substances of concern in electrotechnical products on a consistent global basis.

WARNING – Persons using this International Standard should be familiar with normal laboratory practice. This 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.

iTeh STANDARD PREVIEW (standards.iteh.ai)

<u>SIST EN 62321-4:2014</u> https://standards.iteh.ai/catalog/standards/sist/8eb9fe48-f9ad-4396-bb20-67d1adb7528e/sist-en-62321-4-2014