SLOVENSKI STANDARD
SIST EN IEC 62321-3-1:2026

01-september-2026

Nadomešča:
SIST EN 62321-3-1:2014

Določanje nekaterih snovi v elektrotehničnih izdelkih - 3-1. del: Presejalno določanje vsebnosti svinca, živega srebra, kadmija, celotnega kroma, celotnega broma, celotnega fosforja, celotnega klora, celotnega kositra in celotnega antimona z rentgensko fluorescenčno spektrometrijo

Determination of certain substances in electrotechnical products - Part 3-1: Screening - Lead, mercury, cadmium, total chromium total bromine, total phosphorus, total chlorine, total tin and total antimony content by X-ray fluorescence spectrometry

Verfahren zur Bestimmung von bestimmten Substanzen in Produkten der Elektrotechnik - Teil 3-1: Screening - Gehalt an Blei, Quecksilber, Cadmium, Gesamtchrom, Gesamtbrom, Gesamtphosphor, Gesamtchlor, Gesamtzinn und Gesamtantimon durch Röntgenfluoreszenz-Spektrometrie

Détermination de certaines substances dans les produits électrotechniques - Partie 3-1: Détection de la présence de plomb, mercure, cadmium, chrome total, brome total, phosphore total, chlore total, étain total et antimoine total par la spectrométrie de fluorescence x

Ta slovenski standard je istoveten z: **EN IEC 62321-3-1:2026**

ICS:

13.020.01	Okolje in varstvo okolja na splošno	Environment and environmental protection in general
29.020	Elektrotehnika na splošno	Electrical engineering in general

SIST EN IEC 62321-3-1:2026 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62321-3-1

July 2026

ICS 13.020.01; 43.040.10

Supersedes EN 62321-3-1:2014

English Version

Determination of certain substances in electrotechnical products - Part 3-1: Screening - Lead, mercury, cadmium, total chromium, total bromine, total phosphorus, total chlorine, total tin and total antimony content by X-ray fluorescence spectrometry (IEC 62321-3-1:2026)

Détermination de certaines substances dans les produits électrotechniques - Partie 3-1: Détection - Présence de plomb, mercure, cadmium, chrome total, brome total, phosphore total, chlore total, étain total et antimoine total par la spectrométrie de fluorescence X (IEC 62321-3-1:2026)

Verfahren zur Bestimmung von bestimmten Substanzen in Produkten der Elektrotechnik - Teil 3-1: Screening - Gehalt an Blei, Quecksilber, Cadmium, Gesamtchrom, Gesamtbrom, Gesamtphosphor, Gesamtchlor, Gesamtzinn und Gesamtantimon durch Röntgenfluoreszenz-Spektrometrie (IEC 62321-3-1:2026)

This European Standard was approved by CENELEC on 2026-06-10. 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 alteration.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 62321-3-1:2026 E

European foreword

The text of document 111/871/FDIS, future edition 2 of IEC 62321-3-1, prepared by 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 IEC 62321-3-1:2026.

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 (dop) 2027-07-31
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2029-07-31

This document supersedes EN 62321-3-1:2014 and all of its amendments and corrigenda (if any).

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

This document has been prepared under a standardization request addressed to CENELEC by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

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

Endorsement notice

The text of the International Standard IEC 62321-3-1:2026 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
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, disjointment and mechanical sample preparation	EN IEC 62321-2	-
ISO/IEC Guide 98-1	-	Guide to the expression of uncertainty in measurement – Part 1: Introduction	-	-

IEC 62321-3-1

Edition 2.0 2026-05

INTERNATIONAL STANDARD

HORIZONTAL STANDARD

Determination of certain substances in electrotechnical products - Part 3-1: Screening - Lead, mercury, cadmium, total chromium, total bromine, total phosphorus, total chlorine, total tin and total antimony content by X-ray fluorescence spectrometry

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Determination of certain substances in electrotechnical products - Part 3-1: Screening - Lead, mercury, cadmium, total chromium, total bromine, total phosphorus, total chlorine, total tin and total antimony content by X-ray fluorescence spectrometry

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.
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IEC 62321-3-1 has been prepared by IEC technical committee 111: Environmental standardization for electrical and electronic products and systems. It is an International Standard.

This second edition cancels and replaces the first edition published in 2013 and the first edition of IEC 62321 published in 2008. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous editions of IEC 62321-3-1:2013 and IEC 62321:2008:

a) This second edition of IEC 62321-3-1 includes the analysis of additional elements as indicators for additional substances. The selection is based on IEC TR 62936:2016. There are also comments about using the same methodology for screening for content of critical raw materials (CRMs).

This document has been given the status of a horizontal document in accordance with the ISO/IEC Directives, Part 1.

The text of this International Standard is based on the following documents:

Draft	Report on voting
111/871/FDIS	111/887/RVD

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

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.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

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. With the actual revision the following elements are added: phosphorus (P), assuming the source of P is related to TCEP, Trixylyl-phosphate, chlorine (Cl), assuming the source of Cl is related to SCCP, TCEP, TBTC, tin (Sn), assuming the source of Sn is related to restricted organo-tin compounds, antimony (Sb), assuming the source of Sb is related to Pyrochlore, antimony lead yellow.

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.

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.

The first edition of IEC 62321-3-1 was a partial replacement of IEC 62321:2008, forming a structural revision and generally replacing Clauses 6 and Annex D.

1 Scope

This part of IEC 62321 describes the screening analysis of substances, specifically lead (Pb), mercury (Hg), cadmium (Cd), total chromium (Cr), total bromine (Br), total phosphorus (P), assuming the source of P is related to TCEP (CAS 115-96-8), Trixylyl-phosphate (CAS 25155-23-1), total chlorine (Cl), assuming the source of Cl is related to SCCP (CAS 85535-84-8), TCEP (CAS 115-96-8) , TBTC (CAS 1461-22-9), total tin (Sn), assuming the source of Sn is related to restricted organo-tin compounds, total antimony (Sb), assuming the source of Sb is related to Pyrochlore, and antimony lead yellow (CAS 8012-00-8) in uniform materials found in electrotechnical products, using the analytical technique of X-ray fluorescence (XRF) spectrometry.

The same methodology can also be used for screening of substances discussed as critical raw materials in various countries (for example currently discussed in the EU: antimony (Sb), baryte, bismuth (Bi), cobalt (Co), fluorspar, gallium (Ga), germanium (Ge), hafnium (Hf), indium (In), magnesium (Mg), niobium (Nb), phosphorus (P), scandium (Sc), tantalum (Ta), tungsten (W), vanadium (V), platinum group metals, heavy rare earth elements, light rare earth elements).

NOTE From EU information on critical raw materials [1][1] raw materials are crucial to Europe's economy. They form a strong industrial base, producing a broad range of goods and applications used in everyday life and modern technologies. Reliable and unhindered access to certain raw materials is a growing concern within the EU and across the globe. To address this challenge, the European Commission has created a list of critical raw materials (CRMs) for the EU, which is subject to a regular review and update. CRMs combine raw materials of high importance to the EU economy and of high risk associated with their supply.

The method is applicable to plastics, metals and ceramic materials. The test method can be applied to raw materials, individual materials taken from products and "homogenized" mixtures of more than one material. Screening of a sample is performed using any type of XRF spectrometer, provided it has the performance characteristics specified in this test method. Not all types of XRF spectrometers are suitable for all sizes and shapes of sample. The appropriate spectrometer design will be selected with care for the task concerned.

The performance of this test method has been tested for the following substances in various media and within the concentration ranges as specified in Table 1 to Table 5. During an IIS (international interlaboratory study) the feasibility of the test method to use for the added elements was tested. The results are listed in Table 6 to Table 10.

Table 1 – Tested concentration ranges for lead in materials

Substance/ element	Lead									
Parameter	Unit of measure	Medium/material tested								
		ABS[a]	PE[b]	Low-alloy steel	Al, Al-Si alloy	Lead-free solder	Ground PWB[c]	Crystal glass	PVC[d]	Polyolefin
Concentration or concentration range tested	mg/kg	15,7 to 954	14 to 108	30[e]	190 to 930	174	22 000 to 23 000	240 000	390 to 665	380 to 640

[a] Acrylonitrile butadiene styrene.

[b] Polyethylene.

[c] Printed wiring board.

[d] Polyvinyl chloride.

[e] This lead concentration was not detectable by instruments participating in tests.

[1] Numbers in square brackets refer to the Bibliography.

Table 2 – Tested concentration ranges for mercury in materials

Substance/element	Mercury		
Parameter	Unit of measure	Medium/material tested	
		ABS[a]	PE[b]
Concentration or concentration range tested	mg/kg	100 to 942	4 to 25
[a] Acrylonitrile butadiene styrene.			
[b] Polyethylene.			

Table 3 – Tested concentration ranges for cadmium in materials

Substance/element	Cadmium			
Parameter	Unit of measure	Medium/material tested		
		Lead-free solder	ABS[a]	PE[b]
Concentration or concentration range tested	mg/kg	3[c]	10 to 183	19,6 to 141
[a] Acrylonitrile butadiene styrene.				
[b] Polyethylene.				
[c] This cadmium concentration was not detectable by instruments participating in tests.				

Table 4 – Tested concentration ranges for total chromium in materials

Substance/element	Chromium					
Parameter	Unit of measure	Medium/material tested				
		ABS[a]	PE[b]	Low-alloy steel	Al, Al-Si alloy	Glass
Concentration or concentration range tested	mg/kg	16 to 944	16 to 115	240	130 to 1 100	94
[a] Acrylonitrile butadiene styrene.						
[b] Polyethylene.						

Table 5 – Tested concentration ranges for total bromine in materials

Substance/element	Bromine			
Parameter	Unit of measure	Medium/material tested		
		HIPS[c], ABS[a]	PC/ABS[d]	PE[b]
Concentration or concentration range tested	mg/kg	25 to 118 400	800 to 2 400	96 to 808
[a] Acrylonitrile butadiene styrene.				
[b] Polyethylene.				
[c] High impact polystyrene.				
[d] Polycarbonate and ABS blend.				