

SLOVENSKI STANDARD

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Določevanje posameznih snovi v elektrotehničnih izdelkih - 2. del: Razstavljanje, odklop in mehanska priprava vzorca (IEC 62321-2:2013)

Determination of certain substances in electrotechnical products - Part 2: Disassembly, disjunction and mechanical sample preparation

Verfahren zur Bestimmung von bestimmten Substanzen in Produkten der Elektrotechnik - Teil 2: Demontage, Zerlegung und mechanische Probenvorbereitung

Détermination de certaines substances dans les produits électrotechniques - Partie 2: Démontage, désassemblage et préparation mécanique de l'échantillon

Ta slovenski standard je istoveten z: EN 62321-2:2014

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| 29.020 | Elektrotehnika na splošno | Electrical engineering in general |
| 31.020 | Elektronske komponente na splošno | Electronic components in general |

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 62321-2

April 2014

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Supersedes EN 62321:2009 (partially)

English version

**Determination of certain substances in electrotechnical products -
Part 2: Disassembly, disjointment and mechanical sample preparation
(IEC 62321-2:2013)**

Détermination de certaines substances
dans les produits électrotechniques -
Partie 2: Démontage, désassemblage et
préparation mécanique de l'échantillon
(CEI 62321-2:2013)

Verfahren zur Bestimmung von
bestimmten Substanzen in Produkten der
Elektrotechnik -
Teil 2: Demontage, Zerlegung und
mechanische Probenvorbereitung
(IEC 62321-2:2013)

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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 111/301/FDIS, future edition 1 of IEC 62321-2, 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 62321-2:2014.

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) 2014-10-25
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-11-15

EN 62321-2:2014 is a partial replacement of EN 62321:2009, forming a structural revision and generally replacing Clause 5 and incorporating IEC/PAS 62596:2009 [1]¹⁾ which will be withdrawn upon publication of IEC 62321-2.

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.

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Endorsement notice

The text of the International Standard IEC 62321-2:2013 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

| | | |
|---------------|------|--|
| IEC 62554 | NOTE | Harmonised as EN 62554 (not modified). |
| IEC 62542 | NOTE | Harmonised as EN 62542 (not modified). |
| IEC 62321-6 | NOTE | Harmonised as EN 62321-6 (not modified). |
| IEC 62321-7-1 | NOTE | Harmonised as EN 62321-7-1 (not modified). |
| IEC 62137-1-2 | NOTE | Harmonised as EN 62137-1-2 (not modified). |

¹⁾ Numbers in square brackets refer to the Bibliography.

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> | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-------------|---|--------------|-------------|
| IEC 62321-1 | - | Determination of certain substances in electrotechnical products - Part 1: Introduction and overview | EN 62321-1 | - |
| IEC 62321-3-1 | - | 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 62321-3-2 | - | Determination of certain substances in electrotechnical products - Part 3-2: Screening of total bromine in electric and electronic products by combustion-ion chromatography (C-IC) | EN 62321-3-2 | - |
| IEC 62321-4 | - | 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 | EN 62321-4 | - |
| IEC 62321-5 | - | Determination of certain substances in electrotechnical products - Part 5: Determination of cadmium, lead and chromium in polymers and electronics, and cadmium and lead in metals by AAS, AFS, ICP-OES and ICP-MS | EN 62321-5 | - |

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IEC 62321-2

Edition 1.0 2013-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Determination of certain substances in electrotechnical products –
Part 2: Disassembly, disjointment and mechanical sample preparation**

**Détermination de certaines substances dans les produits électrotechniques –
Partie 2: Démontage, désassemblage et préparation mécanique de l'échantillon**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DETERMINATION OF CERTAIN SUBSTANCES
IN ELECTROTECHNICAL PRODUCTS –**
Part 2: Disassembly, disjointment and mechanical sample preparation

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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International Standard IEC 62321-2 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 62321-2 is a partial replacement of IEC 62321:2008, forming a structural revision and generally replacing Clause 5 and incorporating IEC/PAS 62596:2009 [1]¹ which will be withdrawn upon publication of IEC 62321-2.

¹ Numbers in square brackets refer to the Bibliography.

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 text of this standard is based on the following documents:

| | |
|--------------|------------------|
| FDIS | Report on voting |
| 111/301/FDIS | 111/311/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.

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IMPORTANT – The 'colour inside logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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.

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DETERMINATION OF CERTAIN SUBSTANCES IN ELECTROTECHNICAL PRODUCTS –

Part 2: Disassembly, disjointment and mechanical sample preparation

1 Scope

This part of IEC 62321 provides strategies of sampling along with the mechanical preparation of samples from electrotechnical products, electronic assemblies and electronic components. These samples can be used for analytical testing to determine the levels of certain substances as described in the test methods in other parts of IEC 62321. Restrictions for substances will vary between geographic regions and from time to time. This Standard describes a generic process for obtaining and preparing samples prior to the determination of any substance which are under concern.

This standard does not provide:

- full guidance on each and every product that could be classified as electrotechnical equipment. Since there is a huge variety of electrotechnical components, with various structures and processes, along with the continuous innovations in the industry, it is unrealistic to attempt to provide procedures for the disjointment of every type of component;
- guidance regarding other routes to gather additional information on certain substances in a product, although the information collected has relevance to the sampling strategies in this standard;
- safe disassembly and mechanical disjointment instructions related to electrotechnical products (e.g. mercury-containing switches) and the recycling industry (e.g. how to handle CRTs or the safe removal of batteries). See IEC 62554 [2] for the disjointment and mechanical sample preparation of mercury-containing fluorescent lamps;
- the definition of a “unit” as the sample;
- sampling procedures for packaging and packaging materials;
- analytical procedures to measure the levels of certain substances. This is covered by other standards (for example other parts of IEC 62321), which are referred to as the “test standard” in this standard;
- guidelines for assessment of compliance.

NOTE Further guidance on assessment procedures is provided by IEC/TR 62476 [3].

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.

IEC 62321-1, *Determination of certain substances in electrotechnical products – Part 1 Introduction and overview*

IEC 62321-3-1, *Determination of certain substances in electrotechnical products – Part 3-1: Screening – Lead, mercury, cadmium, total chromium and total bromine using X-ray fluorescence spectrometry*

IEC 62321-3-2, *Determination of certain substances in electrotechnical products – Part 3-2: Screening – Total bromine in polymers and electronics by combustion – Ion chromatography (C-IC)*

IEC 62321-4, *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*

IEC 62321-5, *Determination of certain substances in electrotechnical products – Part 5: Determination of cadmium, lead and chromium in polymers and electronics and cadmium and lead in metals by AAS, AFS, ICP-OES, ICP-AES and ICP-MS²*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the definitions given in IEC 62321-1, as well as the following, apply.

3.1.1

composite testing

testing two or more materials as a single sample that could be mechanically disjointed if necessary

3.1.2

certain substance

cadmium, lead, mercury, hexavalent chromium, polybrominated biphenyl, polybrominated diphenyl ether

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NOTE IEC 62321-1 includes test methods for the evaluation of each of the substances identified in the definition above.

3.2 Abbreviations

| | |
|-------|--|
| AC | Alternating current |
| BGA | Ball grid array (electronic component) |
| CRT | Cathode ray tube (television) |
| DVD | Digital versatile disc |
| IC | Integrated circuit |
| JEDEC | Joint Electronic Devices Engineering Council |
| LCD | Liquid crystal display |
| MDL | Method detection limit |
| OEM | Original equipment manufacturer |
| PAS | Publicly Available Specification |
| PCB | Printed circuit board |
| PDA | Personal digital assistant |
| PWB | Printed wiring board |
| SIM | Subscriber identity module |
| SMD | Surface mounted device |
| TFT | Thin film transistor |
| TV | Television |

USB Universal serial bus

4 Introduction to sampling

4.1 Introductory remark

Obtaining a sample (i.e. sampling) is the first step in analysing electrotechnical products for the presence of certain substances. The strategy and process of sampling are often as important as the analytical measurement itself. Hence an effective sampling strategy requires a clear understanding of the electrotechnical product, reasons for the analysis and the requirements that are to be met.

Sampling and testing for certain substances are performed for many reasons including:

- business-to-business for commercial release (e.g. contractual agreement between the OEM and component manufacturer);
- compliance with regulatory limits;
- forensic/impact assessment (why the product does not satisfy contractual or legal requirements, when did this happen, and how many products are affected?)

4.2 Requirements and concerns for substances of concern

While many governments, industry partners and other stakeholders have their own requirements, it is not the intention of this standard to discuss fully all of these differences. However, awareness of different limits for certain substances is an important step in preparing the sampling strategy. Subclause 4.2 highlights the main areas of concern regarding the requirements for certain substances.

- Certain substances: not all geographic regions or industrial partners restrict the same substances. For example, some regions have chosen to restrict the use of only a few specific PBDE compounds, while others have a broader restriction regarding this class of flame-retardants. When sampling a product, component etc. it is critical to keep in mind what are the applicable legal requirements.
- Allowable limits for certain substances: generally speaking, the allowable levels of most certain substances are below 1 000 mg/kg. Some geographic regions and industrial partners have limits below 1 000 mg/kg. For some product types, limits for certain substances are above 1 000 mg/kg, e.g. lead in copper and aluminum alloys.
- Application of the allowable level: the manner in which the allowable level of a certain substance is applied to an electrotechnical product determines the sampling strategy and how the test results are interpreted. Many geographic regions apply their allowable limits to "homogeneous materials". In this standard, an "homogeneous material" is as defined in IEC 62542 [4]. However, the interpretation of "homogeneous material" is not consistent across the different regions.
- Applicable exemptions: some types of electrotechnical products are exempt from certain substances requirements. These exemptions may be based on different rationales including the scope of the restrictions (e.g. for military purposes), the application of the material (e.g. high melting temperature solder), size of the sample, or the electrical properties of the product.

4.3 Complexity of electrotechnical products and related challenges

The complex characteristics of electrotechnical products are another important consideration when preparing a sampling strategy. These characteristics have a bearing on the practical execution of sampling and analysis. The following elements are identified as relevant to analysis and sampling:

- a) Miniaturization: Miniaturization is one of the key trends in the electrotechnical industry. This implies that more functionality is provided within a smaller volume. More and more components and materials are used per cm² of printed wiring board (PWB) every year.