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Determination of certain substances in electrotechnical products - Part 7-2: Hexavalent chromium -
Determination of hexavalent chromium (Cr(VI)) in polymers and electronics by the colorimetric method

EESTI STANDARDI EESSÕNA

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See Eesti standard EVS-EN 62321-7-2:2017 sisaldab Euroopa standardi EN 62321-7-2:2017 ingliskeelset teksti.	This Estonian standard EVS-EN 62321-7-2:2017 consists of the English text of the European standard EN 62321-7-2:2017.
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English Version

Determination of certain substances in electrotechnical products
- Part 7-2: Hexavalent chromium - Determination of hexavalent
chromium (Cr(VI)) in polymers and electronics by the
colorimetric method
(IEC 62321-7-2:2017)

Détermination de certaines substances dans les produits
électrotechniques - Partie 7-2: Chrome hexavalent -
Détermination du chrome hexavalent (Cr(VI)) dans les
polymères et les produits électroniques par méthode
colorimétrique
(IEC 62321-7-2:2017)

Verfahren zur Bestimmung von bestimmten Substanzen in
Produkten der Elektrotechnik - Teil 7-2: Bestimmung von
sechswertigem Chrom (Cr(VI)) in Polymeren und Elektronik
durch kolorimetrische Verfahren
(IEC 62321-7-2:2017)

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

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European foreword

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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) 2018-02-02
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-05-02

This document supersedes EN 62321:2009 (partially).

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Endorsement notice

The text of the International Standard IEC 62321-7-2:2017 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 62321:2008	NOTE	Harmonized as EN 62321:2009.
IEC 62321-2	NOTE	Harmonized as EN 62321-2.
ISO 648	NOTE	Harmonized as EN ISO 648.

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INTRODUCTION

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

The use of hexavalent chromium in electrotechnical products is of concern in many regions of the world.

The purpose of this document is therefore to provide test methods that will allow the electrotechnical industry to determine the levels of hexavalent chromium in electrotechnical products on a consistent global basis.

WARNING – Persons using this document should be familiar with normal laboratory practice. This document 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 7-2: Hexavalent chromium – Determination of hexavalent chromium (Cr(VI)) in polymers and electronics by the colorimetric method

1 Scope

This part of IEC 62321 describes procedures to measure hexavalent chromium, Cr(VI), quantitatively in samples of polymers and electronics. This method employs organic solvent to dissolve or swell the sample matrix, followed by an alkaline digestion procedure to extract Cr(VI) from samples. Studies have shown that organic/alkaline solution is more effective than acidic solution in extracting Cr(VI) from soluble and insoluble samples. Minimal reduction of Cr(VI) to Cr(III) or oxidation of Cr(III) to Cr(VI) occurs under alkaline conditions.

For soluble polymers consisting of ABS (Acrylonitrile- butadiene-styrene), PC (Polycarbonate) and PVC (poly(vinyl chloride)), the samples are first dissolved in an appropriate organic solvent and Cr(VI) is then extracted by an alkaline extraction solution.

For insoluble/unknown polymers, or electronic materials that do not contain antimony (Sb), the samples are digested in a toluene/alkaline solution at 150 °C to 160 °C. Then the organic phase in the extracts are separated and discarded; the inorganic phase is retained for Cr(VI) analysis.

The Cr(VI) concentration in the extract is determined by its reaction under acidic conditions with 1,5-diphenylcarbazide. Cr(VI) is reduced to Cr(III) in the reaction with diphenylcarbazide which is oxidized to diphenylcarbazone. The Cr(III) and diphenylcarbazone form a red-violet-coloured complex in the reaction. The complex solution is measured quantitatively by a colorimeter or a spectrophotometer at 540 nm.

2 Normative references

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.

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

ISO 3696, *Water for analytical laboratory use – Specification and test methods*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62321-1 apply.