

Nederlandse norm

NEN-EN 15411

(en)

Solid recovered fuels - Methods for the determination of the content of trace elements (As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mo, Mn, Ni, Pb, Sb, Se, Ti, V and Zn)

Vervangt NPR-CEN/TS 15411:2006;
NEN-EN 15411:2010 Ontw.

ICS 75.160.10
september 2011

Als Nederlandse norm is aanvaard:
 - EN 15411:2011, IDT

Voorbeeld
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Normcommissie 310029 "Vaste biolandstoffen"



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Voor de in deze norm vermelde normatieve verwijzingen bestaan in Nederland de volgende equivalenten:

<u>vermelde norm</u>	<u>Nederlandse norm</u>	<u>titel</u>
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EN 15357:2011	NEN-EN 15357:2011	Vaste secundaire brandstoffen - Terminologie, definities en beschrijvingen
EN 15403	NEN-EN 15403	Vaste secundaire brandstoffen - Methoden voor de bepaling van het asgehalte
EN 15413	-	-
EN 15414-3	NEN-EN 15414-3	Vaste secundaire brandstoffen - Methoden voor de bepaling van het vochtgehalte - Methode met drogen in de oven - Deel 3: Vochtgehalte in het algemene analysemonster
EN ISO 3696:1995	NEN-EN-ISO 3696:1995	Water voor analytische laboratoriumdoeleinden - Eisen en beproevingsmethoden

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English Version

**Solid recovered fuels - Methods for the determination of the
 content of trace elements (As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mo,
 Mn, Ni, Pb, Sb, Se, Ti, V and Zn)**

Combustibles solides de récupération - Méthodes de
 détermination de la teneur en éléments à l'état de traces
 (As, Ba, Be, Cd, Co, Cr, Cu, Hg, Mo, Mn, Ni, Pb, Sb, Se,
 Ti, V et Zn)

Feste Sekundärbrennstoffe - Verfahren zur Bestimmung
 des Gehaltes an Spurelementen (As, Ba, Be, Cd, Co, Cr,
 Cu, Hg, Mo, Mn, Ni, Pb, Sb, Se, Ti, V und Zn)

This European Standard was approved by CEN on 15 July 2011.

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Foreword

This document (EN 15411:2011) has been prepared by Technical Committee CEN/TC 343 "Solid Recovered Fuels", the secretariat of which is held by SFS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2012, and conflicting national standards shall be withdrawn at the latest by March 2012.

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This document supersedes CEN/TS 15411:2006.

This document differs from CEN/TS 15411:2006 only editorially.

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Introduction

Accurate determination of trace element content in solid recovered fuels is important for environmental and technical reasons both in the production and combustion stage. After digestion of the solid recovered fuels using different methods, a number of analytical techniques can be used for the quantification of the trace element content. They include Inductively Coupled Plasma with optical or mass detection, graphite furnace Atomic Absorption Spectrometry and, when available, dedicated specific method (e.g. for mercury).

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1 Scope

This European Standard specifies three methods of digestion for solid recovered fuels:

- a) microwave assisted digestion with hydrofluoric, nitric and hydrochloric acid mixture;
- b) hot water bath digestion of with hydrofluoric, nitric and hydrochloric acid mixture, after ashing of the SRFs sample;
- c) oven digestion with nitric, perchloric and hydrofluoric acid mixture.

Instrumental determination of As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Mo, Ni, Sb, Se, Tl, V, Zn is performed by Inductively Coupled Plasma with optical or mass detection or graphite furnace Atomic Absorption Spectrometry. Hg can be analysed only after the microwave assisted procedure or, alternatively, by a direct analysis method (Hg direct – AMA).

The effectiveness of the digestion can be verified by qualitative X-ray fluorescence (XRF) analysis on the remaining residue. If necessary, an alternative digestion method (among those proposed) is used.

Method a) is recommended for general use, but the amount of the test portion can be very low in case of high concentration of organic matter.

Method b) is recommended for Solid Recovered Fuel (SRF) with high organic matter concentration that can be difficult to digest with the other methods. This method is not suitable for mercury.

Method c) is recommended for Solid Recovered Fuel (SRF) samples for which the other methods leave a significant insoluble residue.

Alternative digestion methods can be applied if their performance is proved to be comparable with those of the methods mentioned in a) to c) (see Annex C).

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13656, *Characterization of waste — Microwave assisted digestion with hydrofluoric (HF), nitric (HNO₃) and hydrochloric (HCl) acid mixture for subsequent determination of elements*

EN 15357:2011, *Solid recovered fuels — Terminology, definitions and descriptions*

EN 15403, *Solid recovered fuels — Determination of ash content*

EN 15413, *Solid recovered fuels — Methods for the preparation of the test sample from the laboratory sample*

EN 15414-3, *Solid recovered fuels — Determination of moisture content using the oven dry method — Part 3: Moisture in general analysis sample*

EN ISO 3696:1995, *Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in EN 15357:2011 and the following apply.

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