

**Solid biofuels - Determination of major elements - Al,
Ca, Fe, Mg, P, K, Si, Na and Ti**

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

**Solid biofuels - Determination of major elements - Al, Ca, Fe,
Mg, P, K, Si, Na and Ti**Biocombustibles solides - Dosage des éléments majeurs -
Al, Ca, Fe, Mg, P, K, Si, Na et TiFeste Biobrennstoffe - Bestimmung von Hauptelementen -
Al, Ca, Fe, Mg, P, K, Si, Na und Ti

This European Standard was approved by CEN on 25 December 2010.

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Foreword

This document (EN 15290:2011) has been prepared by Technical Committee CEN/TC 335 "Solid biofuels", the secretariat of which is held by SIS.

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of an identical text or by endorsement, at the latest by August 2011, and conflicting national standards shall be withdrawn at the latest by August 2011.

This document supersedes CEN/TS 15290:2006.

In the pre-normative project BIONORM I&II a robustness test has been performed to find out if all critical parameters in the standard were addressed. Based on the results of that test it has been concluded that all critical parameters were covered. Only minor technical changes were necessary which have been implemented in the revised text. The revision also includes a change of deliverable from Technical Specification to European Standard and updated normative references.

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Introduction

The elements described as major elements of solid biofuels are in fact major elements of the fuel ashes more than of the fuels. The determination of these elements may be used to assess ash behaviour in a thermal conversion process or to assess utilisation of ashes. Moreover, fuel contamination or process additives are indicated by high values of certain elements. Contamination of fuel with sand or soil is indicated by high values of several elements.

In this European Standard, wet chemical methods are described. As an alternative, X-ray fluorescence (XRF) may be used when validated with suitable materials (biomass reference materials).

1 Scope

This European Standard specifies methods for the determination of major elements of solid biofuels respectively of their ashes, which are Al, Ca, Fe, Mg, P, K, Si, Na, Ti. The determination of other elements such as barium (Ba) and manganese (Mn) is also possible with the methods described in this European Standard.

The European Standard includes two parts: Part A describes the direct determination on the fuel, this method is also applicable for sulfur and minor elements, Part B gives a method of determination on a prepared 550 °C ash.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 14588:2010, *Solid biofuels — Terminology, definitions and descriptions*

EN 14774-3, *Solid biofuels — Determination of moisture content — Oven dry method — Part 3: Moisture in general analysis sample*

EN 14775, *Solid biofuels — Determination of ash content*

FprEN 14780, *Solid biofuels — Sample preparation*

EN 15296, *Solid biofuels — Conversion of analytical results from one basis to another*

EN ISO 7980, *Water quality — Determination of calcium and magnesium — Atomic absorption spectrometric method (ISO 7980:1986)*

EN ISO 11885, *Water quality — Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES) (ISO 11885:2007)*

EN ISO 17294-2, *Water quality — Application of inductively coupled plasma mass spectrometry (ICP-MS) — Part 2: Determination of 62 elements (ISO 17294-2:2003)*

ISO 9964-1, *Water quality — Determination of sodium and potassium — Part 1: Determination of sodium by atomic absorption spectrometry*

ISO 9964-2, *Water quality — Determination of sodium and potassium — Part 2: Determination of potassium by atomic absorption spectrometry*

ISO 9964-3, *Water quality — Determination of sodium and potassium — Part 3: Determination of sodium and potassium by flame emission spectrometry*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14588:2010 and the following apply.