



NSAI
Standards

Irish Standard
I.S. EN 16476:2014

Liquid petroleum products - Determination of Sodium, Potassium, Calcium, Phosphorus, Copper and Zinc contents in diesel fuel - Method via Inductively Coupled Plasma Optical Emission Spectrometry (ICP OES)

I.S. EN 16476:2014

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English Version

Liquid petroleum products - Determination of Sodium,
Potassium, Calcium, Phosphorus, Copper and Zinc contents in
diesel fuel - Method via Inductively Coupled Plasma Optical
Emission Spectrometry (ICP OES)

Produits pétroliers liquides - Détermination des
concentrations en sodium, potassium, calcium, phosphore,
cuivre et zinc dans le gazole - Méthode par spectrométrie
d'émission atomique par plasma à couplage inductif (ICP
OES)

Flüssige Mineralölzeugnisse - Bestimmung des Gehalts
an Natrium, Kalium, Calcium, Phosphor, Kupfer, Zink in
Dieselkraftstoffen - Direkte Bestimmung durch optische
Emissionsspektrometrie mit induktiv gekoppeltem Plasma
(ICP OES)

This European Standard was approved by CEN on 20 March 2014.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EN 16476:2014 (E)

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Foreword

This document (EN 16476:2014) has been prepared by Technical Committee CEN/TC 19 “Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin”, the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by November 2014 and conflicting national standards shall be withdrawn at the latest by November 2014.

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

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EN 16476:2014 (E)

Introduction

This document specifies a method for determining concentration of the six most essential ash forming elements. The number of six was chosen in order to limit the complexity of the test and to be able to determine a decent method precision. The six elements were specified by the vehicle manufacturers. The test provides additional information to the more common ash concentration determination methods which do aim towards filter problems. Metals have more impact on the durability of modern DPF exhaust gas after-treatment systems in diesel vehicles than ash in general.

1 Scope

This European Standard specifies an inductively coupled plasma optical emission spectrometry (ICP OES) method for the determination of sodium, potassium, calcium, phosphorus, copper and zinc concentrations of diesel fuels, including those containing up to 30 % (V/V) fatty acid methyl ester (FAME), in the range detailed in Table 1. These six elements are considered as the most essential ash forming elements.

Table 1 — Application ranges for ash forming elements

Element	Range mg/kg
Sodium	1,2 to 2,5
Potassium	0,9 to 2,5
Calcium	0,3 to 2,5
Phosphorus	0,9 to 2,5
Copper	0,2 to 2,5
Zinc	0,2 to 2,5

NOTE For the purposes of this European Standard, the term “% (V/V)” is used to represent the volume fraction, φ .

WARNING — The use of this European Standard may involve hazardous materials, operations and equipment. This European Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this European Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

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.

EN ISO 1042, *Laboratory glassware - One-mark volumetric flasks (ISO 1042)*

EN ISO 3170, *Petroleum liquids - Manual sampling (ISO 3170)*

EN ISO 3171, *Petroleum liquids - Automatic pipeline sampling (ISO 3171)*

3 Principle

A weighed amount of diesel fuel sample is diluted with an organic solvent. The solution is then introduced directly into an ICP OES spectrometer. Sodium, potassium, calcium, phosphorous, copper and zinc concentrations are determined by comparison with calibration solutions. An Internal Standard is employed to correct viscosity effects.

4 Reagents

If not specified otherwise, only chemicals of a known high degree of purity shall be used.

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