

This is a preview of "BS EN 15751:2014". Click here to purchase the full version from the ANSI store.

BS EN 15751:2014
BS 2000-574:2014



BSI Standards Publication

Automotive fuels — Fatty acid methyl ester (FAME) fuel and blends with diesel fuel — Determination of oxidation stability by accelerated oxidation method

bsi.

...making excellence a habit.™

This is a preview of "BS EN 15751:2014". [Click here to purchase the full version from the ANSI store.](#)

This British Standard is the UK implementation of EN 15751:2014. It supersedes BS EN 15751:2009/BS 2000-574:2009 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PTI/13, Petroleum Testing and Terminology.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2014.
Published by BSI Standards Limited 2014

ISBN 978 0 580 79994 5
ICS 75.160.20

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2014.

BS 2000 Series

Energy Institute, under the brand of IP, publishes and sells all Parts of BS 2000, and all BS EN and BS ISO petroleum test methods that would be part of BS 2000, both in its annual publication "IP Standard Test Methods for analysis and testing of petroleum and related products, and British Standard 2000 Parts" and individually.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

This is a preview of "BS EN 15751:2014". [Click here to purchase the full version from the ANSI store.](#)

EUROPÄISCHE NORM

March 2014

ICS 75.160.20

Supersedes EN 15751:2009

English Version

Automotive fuels - Fatty acid methyl ester (FAME) fuel and blends with diesel fuel - Determination of oxidation stability by accelerated oxidation method

Carburants pour automobiles - Esters méthyliques d'acides gras (EMAG) et mélanges avec du gazole - Détermination de la stabilité à l'oxydation par méthode d'oxydation accélérée

Kraftstoffe für Kraftfahrzeuge - Kraftstoff Fettsäuremethylester (FAME) und Mischungen mit Dieselmotorkraftstoff - Bestimmung der Oxidationsstabilität (beschleunigtes Oxidationsverfahren)

This European Standard was approved by CEN on 20 December 2013.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

This is a preview of "BS EN 15751:2014". [Click here to purchase the full version from the ANSI store.](#)

Contents	Page
Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Principle	5
5 Reagents and materials	6
6 Apparatus	6
7 Sampling	7
8 Preparation of measurement	8
8.1 Preparation of test sample	8
8.2 Preparation of apparatus	8
9 Measurement	10
10 Calculation and evaluation	13
10.1 Automatic evaluation	13
10.2 Manual evaluation	14
11 Expression of results	14
12 Precision	14
12.1 General	14
12.2 Repeatability, r	14
12.3 Reproducibility, R	14
13 Test report	15
Annex A (informative) Background of the method	16
Bibliography	17

This is a preview of "BS EN 15751:2014". [Click here to purchase the full version from the ANSI store.](#)

Foreword

This document (EN 15751:2014) 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 September 2014 and conflicting national standards shall be withdrawn at the latest by September 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.

This document supersedes EN 15751:2009.

Significant changes between this document and EN 15751:2009 are:

- a) the limitation of the scope of the method to a maximum induction period of 48 h, reflecting the precision range of the method,
- b) indication of a potential alteration of the induction period in the presence of cetane enhancers,
- c) inclusion of the results of a short applicability check on non-petroleum based (such as Fischer-Tropsch synthesis or hydrotreatment process originated) diesel type of fuels (see Introduction),
- d) editorial changes in order to clarify the test procedure.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

This is a preview of "BS EN 15751:2014". [Click here to purchase the full version from the ANSI store.](#)

Introduction

This document is based on EN 14112 [1], which was specifically adapted for the determination of oxidation stability of fatty acid methyl esters (FAME). This method had been developed under CEN/TC 307 (Fats and oils). At the time of development the method was applicable for FAME fuel according to EN 14214 [2], but questions remained on the accuracy towards blends of FAME and diesel fuel.

The modifications to EN 14112 as given in this document, allow application of this test method for oxidation stability for pure FAME and diesel/FAME blends at various levels.

The goal was to have one single test method for FAME fuel, diesel/FAME blends and pure diesel fuels. Although the modifications cover FAME fuel and diesel/FAME blends, CEN/TC 307 decided that it was better to retain EN 14112 for methyl esters and publish a separate standard for all automotive fuel and heating oil applications, as the use of 'diesel and diesel blends' falls out the scope of CEN/TC 307.

While developing the fuels specification for paraffinic diesel fuel, three labs executed a small test on neat fuel and on 7 % (V/V) FAME blend based on product originating from both Fischer-Tropsch synthesis and hydrotreatment process. No indications towards a different interaction with the methodology of this document were found, so it was concluded that the stability of these paraffinic diesel fuels can be determined with the test method described in this document. The stability of these products usually is that high that the results do not match the scope of this European Standard.

The modifications required a new validation covering pure FAME, diesel/FAME blends and pure diesel fuels which resulted in the fact that the method is not suitable for pure petroleum-based diesel fuels.

This is a preview of "BS EN 15751:2014". [Click here to purchase the full version from the ANSI store.](#)

1 Scope

This European Standard specifies a test method for the determination of the oxidation stability of fuels for diesel engines, by means of measuring the induction period of the fuel up to 48 h. The method is applicable to fatty acid methyl esters (FAME) intended for the use as pure biofuel or as a blending component for diesel fuels, and to blends of FAME with diesel fuel containing 2 % (V/V) of FAME at minimum.

NOTE 1 EN 14112 [1] describes a similar test method for oxidation stability determination of pure fatty acid methyl esters (see the Introduction to this European Standard).

NOTE 2 For induction periods higher than 48 h the precision is not covered by the precision statement of this method. The limit values of the relevant fuel standards are well within the scope of this test method.

NOTE 3 The presence of cetane improver can reduce the oxidation stability determined by this test method. Limited studies with EHN (2-ethyl hexyl nitrate) indicated, however, that the stability is reduced to an extent which is within the reproducibility of the test method.

NOTE 4 For the purposes of this European Standard, the term "% (V/V)" is used to represent the volume fraction (φ) of a material.

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

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

induction period

time which passes between the moment when the measurement is started and the moment when the formation of oxidation products begins to increase rapidly

3.2

oxidation stability

induction period determined according to the procedure specified in this European Standard, expressed in hours

4 Principle

A stream of purified air is passed through the sample which has been heated to the target temperature which is 110 °C in the usual application of the method. Volatile compounds are formed during the oxidation process. They are, passed together with the air into a flask containing demineralised or distilled water, equipped with a conductivity electrode. The electrode is connected to a measuring and recording device. It indicates the end of the induction period by rapid increase of the conductivity due to the dissociation of volatile carboxylic acids produced during the oxidation process and absorbed in the water. For more details on the background of the method, see Annex A.