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BSI Standards Publication

Automotive fuels — Diesel — Requirements and test methods

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National foreword

This British Standard is the UK implementation of EN 590:2022. It supersedes BS EN 590:2013+A1:2017, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PTI/2, Liquid Fuels.

This standard is also applicable to diesel fuel used in non-road mobile machinery and stationary internal combustion engines used in agricultural, forestry, domestic and industrial applications.

The UK committee draws users' attention to normative National Annexes NA, NB, NC, and ND, appended at the back of this document, which provide further guidance to assist users in the application of this standard.

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

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| 31 May 2023 | Correction to National Annex NC, Table NC.2 |

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Supersedes EN 590:2013+A1:2017

English Version

Automotive fuels - Diesel - Requirements and test methods

Carburants pour automobiles - Carburants pour
moteur diesel (gazole) - Exigences et méthodes d'essai

Kraftstoffe - Dieselkraftstoff - Anforderungen und
Prüfverfahren

This European Standard was approved by CEN on 6 January 2022.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

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European foreword

This document (EN 590:2022) 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 2022, and conflicting national standards shall be withdrawn at the latest by September 2022.

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

This document supersedes EN 590:2013+A1:2017.

This document has originally been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association [6].

Requirements following amendment 2003/17/EC [2], 2009/30/EC [3], 2011/63/EU [4] and 2014/77/EU [5] to the European Fuels Quality Directive 98/70/EC [1], are taken into account. Dates are included with all normative test method references for properties required by Annex II of the Fuels Quality Directive in order to comply with the requirements of the European Commission; with the accompanying assurance by CEN/TC 19 that any referenced updated versions will always give similar accuracy and the same or better precision (see [4]).

The marking at the pump of this product is in line with the requirements of the Fuels Quality Directive and the Alternative Fuels Infrastructure Directive [7].

Further significant technical changes between this document and the previous edition are:

- Inclusion of the amended EN 14214 FAME specification.
- Update to the normative references towards undated versions where they don't concern requirements originating from European Directives (in line with decisions by CEN/TC 19 in coordination with the European Commission), and updating the effective publication dates where required.
- Introduction of the new section "Terms and Definitions".
- Correct use of the decimal point in limits has been implemented to align with test method reporting requirements (Rancimat by EN 15751) and the European Fuels Directive 98/70/EC [1], including subsequent Amendments [2], [3], [4] and [5] (distillation 95 % (V/V) recovered).
- Deletion of the Fuel Ignition Tester (EN 16144) as an alternative test method for cetane number determination due to its absence of use in the market. Whereas the BASF engine (EN 16906) and the ICN technique (EN 17155) have now been included as alternative methods for cetane number determination.
- Addition of micro-distillation (EN 17306) as an alternative test method to distillation by EN ISO 3405 and EN ISO 3924.
- Addition of automated method (EN ISO 22995) as an alternative test method to cloud point by EN ISO 3015.

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- Addition of the Stabinger viscometer (ISO 23581) as an alternative test method to viscosity by EN ISO 3104.
- Addition of oxidation stability by rapid small scale oxidation method (EN 16091) as an alternative test method to oxidation stability by EN 15751 for diesel fuel containing FAME above 2,0 % (V/V).
- Deletion of Annex A and changes to 6.5.1 in relation to test method precision data for diesel fuel containing FAME.
- Update to the 'workmanship clause' in 6.5.3 to address the issue of abrasive wear of fuel injection equipment by hard particles in diesel fuel.
- Introduction of further clarification around the lubricity requirement in Table 1.
- Reduction of the minimum density limit for Grades D, E and F, moving the property from Table 1 to Table 2.
- Clarification of the dispute requirement concerning sulfur content in 6.7.3.
- Deletion of the allowance for cetane alternative methods in 6.7.4.
- Addition of 6.7.10 to address situations in which the test method includes a bias-correction to the dispute method.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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

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1 Scope

This document specifies requirements and test methods for marketed and delivered automotive diesel fuel. It is applicable to automotive diesel fuel for use in diesel engine vehicles designed to run on automotive diesel fuel containing up to 7,0 % (V/V) Fatty Acid Methyl Ester (FAME).

NOTE For the purposes of this document, the terms "% (m/m)" and "% (V/V)" are used to represent respectively the mass fraction and the volume fraction.

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.

EN 116, *Diesel and domestic heating fuels - Determination of cold filter plugging point - Stepwise cooling bath method*

EN 12662, *Liquid petroleum products - Determination of total contamination in middle distillates, diesel fuels and fatty acid methyl esters*

EN 12916:2019, *Petroleum products - Determination of aromatic hydrocarbon types in middle distillates - High performance liquid chromatography method with refractive index detection*

EN 14078:2014, *Liquid petroleum products - Determination of fatty acid methyl ester (FAME) content in middle distillates - Infrared spectrometry method*

EN 14214:2012+A2:2019, *Liquid petroleum products - Fatty acid methyl esters (FAME) for use in diesel engines and heating applications - Requirements and test methods*

EN 15195:2014, *Liquid petroleum products - Determination of ignition delay and derived cetane number (DCN) of middle distillate fuels by combustion in a constant volume chamber*

EN 15751, *Automotive fuels - Fatty acid methyl ester (FAME) fuel and blends with diesel fuel - Determination of oxidation stability by accelerated oxidation method*

EN 16091, *Liquid petroleum products - Middle distillates and fatty acid methyl ester (FAME) fuels and blends - Determination of oxidation stability by rapid small scale oxidation method*

EN 16329, *Diesel and domestic heating fuels - Determination of cold filter plugging point - Linear cooling bath method*

EN 16576:2014, *Automotive fuels - Determination of manganese and iron content in diesel - Inductively coupled plasma optical emission spectrometry (ICP OES) method*

EN 16715:2015, *Liquid petroleum products - Determination of ignition delay and derived cetane number (DCN) of middle distillate fuels - Ignition delay and combustion delay determination using a constant volume combustion chamber with direct fuel injection*

EN 16906:2017, *Liquid petroleum products - Determination of the ignition quality of diesel fuels - BASF engine method*

EN 16942, *Fuels - Identification of vehicle compatibility - Graphical expression for consumer information*