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Fordonsbränslen – Paraffiniskt dieselbränsle från syntes eller hydrobehandling – Krav och provningsmetoder

Automotive fuels – Paraffinic diesel fuel from synthesis or hydrotreatment – Requirements and test methods

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The European Standard EN 15940:2016 has the status of a Swedish Standard. This document contains the official English version of EN 15940:2016.

Nationell information
Standarden innehåller *Bilaga NA (normativ) Nationella krav på pumpmärkning samt klimatbetingade krav*

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Motorbränslen, SIS/TK 415.

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 15940

June 2016

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Supersedes CEN/TS 15940:2012

English Version

Automotive fuels - Paraffinic diesel fuel from synthesis or hydrotreatment - Requirements and test methods

Carburants pour automobiles - Gazoles paraffiniques de synthèse ou obtenus par hydrotraitement - Exigences et méthodes d'essais

Kraftstoffe für Kraftfahrzeuge - Paraffinischer Dieselkraftstoff aus Synthese oder Hydrierungsverfahren - Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 15 April 2016.

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.

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

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

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European foreword

This document (EN 15940:2016) 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 December 2016, and conflicting national standards shall be withdrawn at the latest by December 2016.

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 CEN/TS 15940:2012.

Significant other technical changes between this document and CEN/TS 15940:2012 are:

a) the limits for distillation at 250 °C and 350 °C are included in line with EN 590 and the EU Common Customs tariff for diesel fuel;

b) EN ISO 3924, also known as simulated distillation, has been incorporated in Table 1 as an additional methodology to determine distillation characteristics;

c) prEN 16906 (EN equivalent to DIN 51773, *Testing of liquid fuels — Determination of ignition quality (cetane number) of Diesel fuels with the BASF-engine*) has been studied and allowed as an additional methodology to determine cetane number;

d) in order to allow fitness for purpose product and to align it with EN 590 product that has proven functionality in diesel engines, the arctic climate viscosity limits and the distillation recovery at 180 °C have been introduced in Table 3;

e) in order to present all relevant requirements within the same fuel specification, the necessary climate dependent properties from EN 590 have been introduced in 5.7; this required reference of some additional test methods in Clause 2;

f) further clarification on the oxidation stability requirement, as a result of recent changes in EN 15751, has been introduced;

g) exclusion of special sampling procedures for clean paraffinic fuel as they apply to diesel fuel in general;

h) to further underline the link with EN 590 that normative reference being stipulated without reference to a particular date of publication;

i) introduction of an annex of the precision data for test methods where different from normal diesel fuel in following the CEN/TC 19 interlaboratory study [1];

j) introduction of an annex covering a test procedure for aromatics content determination being developed as part of a second interlaboratory study funded by the EC on three different HPLC techniques;

k) introduction of an annex on density – temperature corrections being developed as part of a CEN/TC 19 investigation led by Mr. H. Th. Feuerhelm of DIN-FAM.

In this document, all relevant characteristics, requirements and test methods are specified. These specifications are relevant for the driveability of the vehicles and are currently known to prevent harm to the vehicles and their powertrains. Climate dependent requirements of this document may vary according to national adoptions of EN 590 and EN 14214, but should be indicated by a specific National Annex.

Several assessments of test methods for paraffinic diesel fuel have been executed and the results thereof [1] led to conclusions regarding the applicability of each of the test methods as required in Clause 5. The conclusion of these assessments, partially funded by the European Commission, led to the possibility to upgrade the original Technical Specification into a full European Standard. Although it is its main actual use, the product is now no longer limited to captive fleet usage, but the scope defines the need to check the use of the product with the vehicle manufacturer. There are no EU legislative needs to limit the product to captive fleets. Such restriction is not for the specification but for the market to decide upon. Therefore, and in the light of the defined need to check the use of the product with the vehicle manufacturer, all restrictions towards captive fleet from the CEN/TS text have been deleted

This document is based on current knowledge at the time of publishing, but will require revision when the specification for either regular automotive diesel fuel, EN 590, or FAME, EN 14214, has been determined (revised) by CEN/TC 19 or based on further experiences with the use of paraffinic diesel fuel according to this document. Further background can be found in CEN/TR 16389 [2].

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.

Introduction

This document has been laid down to define a quality specification for diesel fuel on the basis of synthesis gas or of hydrotreated bio-oils or -fats. Its main use is as diesel fuel in dedicated diesel vehicle fleets and engines. Paraffinic diesel fuel does not meet the current diesel fuel specification, EN 590. The main differences between paraffinic diesel fuel and automotive diesel fuel are in the areas of density, sulfur, aromatics and cetane. Its density can be outside the regular diesel specification, and the described class A type fuel has a higher cetane number. Paraffinic diesel fuel is not validated for all vehicles, consult vehicle manufacturer before use.

Paraffinic diesel is a high quality, clean burning fuel with virtually no sulfur and aromatics. Paraffinic diesel fuel can be used in diesel engines (see NOTE 1 under Clause 1 and the last paragraph of Clause 4), also to reduce regulated emissions. In order to have the greatest possible emissions reduction, a specific calibration may be necessary. Paraffinic diesel fuel can also offer a meaningful contribution to the target of increased non-petroleum and/or renewable content in transportation fuel pool.

As some production processes result in a fuel containing *cyclo*-paraffins, as well as *n*-paraffins and *iso*-paraffins, they show different cetane number compared to other paraffinic diesel fuels. Hence, in this document, two classes have been defined, one class showing improved ignition quality compared to regular diesel fuel.

Blending of paraffinic diesel with biodiesel (FAME) is covered in this document. Against the background of the EU Renewable Energy Directive (RED, 2009/28/EC [3]) and also the latest developments regarding European regular diesel specification, there is now a pressing requirement to allow for FAME blend variations of those paraffinic fuels, which are not already classified as being from renewable resources.

As with CEN/TS 15940, this document allows for a paraffinic diesel specification other than the former CWA 15940, to “mirror” the current EN 590 diesel fuel quality specification. That is, allowing a blend variant of paraffinic diesel in the same way that CEN diesel quality specifications allow for refinery diesel up to 7 % (*V/V*) FAME blend percentage.

Paraffinic diesel may also be used as a blending component for automotive diesel fuel, but this is not in the scope of this document.

The document will be usable on a voluntary basis for engine clearance, fuel acceptance and fuelling station allowance, supporting both local regulations and international trade.

1 Scope

This European Standard describes requirements and test methods for marketed and delivered paraffinic diesel fuel containing a level of up to 7,0 % (*V/V*) fatty acid methyl ester (FAME). It is applicable to fuel for use in diesel engines and vehicles compatible with paraffinic diesel fuel. It defines two classes of paraffinic diesel fuel: high cetane and normal cetane.

Paraffinic diesel fuel originates from synthesis or hydrotreatment processes.

NOTE 1 For general diesel engine warranty, paraffinic automotive diesel fuel may need a validation step, which for some existing engines may still need to be done (see also the Introduction to this document). The vehicle manufacturer needs to be consulted before use.

NOTE 2 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, 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 116:2015, *Diesel and domestic heating fuels — Determination of cold filter plugging point — Stepwise cooling bath method*

EN 12662:2014, *Liquid petroleum products — Determination of total contamination in middle distillates, diesel fuels and fatty acid methyl esters*

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

EN 14214:2012+A1:2014, *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 15751:2014, *Automotive fuels — Fatty acid methyl ester (FAME) fuel and blends with diesel fuel — Determination of oxidation stability by accelerated oxidation method*

EN 16136:2015, *Automotive fuels — Determination of manganese and iron content in unleaded petrol — Inductively coupled plasma optical emission spectrometry (ICP OES) method*

EN 16329:2013, *Diesel and domestic heating fuels — Determination of cold filter plugging point — Linear cooling bath method*

prEN 16906, *Liquid petroleum products — Determination of the ignition quality of diesel fuels — BASF engine method*

EN 23015:1994, *Petroleum products — Determination of cloud point (ISO 3015:1992)*

EN ISO 1042:1999, *Laboratory glassware — One-mark volumetric flasks (ISO 1042:1998)*

EN ISO 2160:1998, *Petroleum products — Corrosiveness to copper — Copper strip test (ISO 2160:1998)*