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Liquid petroleum products - Determination of the ignition quality of diesel fuels - Fixed compression ratio engine method

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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English Version

Liquid petroleum products - Determination of the ignition quality of diesel fuels - Fixed compression ratio engine method

Produits pétroliers liquides - Détermination de la qualité d'allumage des combustibles Diesel - Méthode avec moteur à taux de compression fixe

Flüssige Mineralölerzeugnisse - Bestimmung der Zündwilligkeit von Dieselkraftstoffen - Verfahren mit einem Prüfmotor mit konstantem Verdichtungsverhältnis

This European Standard was approved by CEN on 4 September 2023.

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

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European foreword

This document (EN 16906:2023) 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of an identical text or by endorsement, at the latest by April 2024, and conflicting national standards shall be withdrawn at the latest by April 2024.

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 16906:2017.

The main changes compared to the previous edition EN 16906:2017 are listed below:

— new title;

— new scope and precision based on proficiency testing scheme data within DIN-FAM;

— introduction of a new low cetane primary reference fuel, pentamethylheptane (PMH);

— introduction of a statistical observable bias with EN ISO 5165 in the expression of results section.

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, Türkiye and the United Kingdom.

Introduction

The test method described in this document is based on DIN 51773 [1], which had been developed in the German group, DIN NA 062-06-43 AA “Combustion characteristic of fuels”, and which has been used very successfully since more than 40 years. It was originally known as the 'BASF engine'.

The described method is an alternative quantitative determination of the cetane number of middle distillate fuels intended for use in compression ignition engines.

A correlation study between this method and EN ISO 5165 has been done and the results of this are incorporated in the precision report issued in 2019 [2] and in this document.

The testing of pure FAME (which is in the scope of EN ISO 5165) has been excluded from the scope for the time being as there seems to be sample specific biases for such product. CEN will initiate appropriate causal studies.

1 Scope

This document specifies a test method for the determination of cetane numbers (“CN”) of diesel fuels, using a standard single cylinder, four-stroke cycle, indirect injection engine. The cetane number provides a measure of the ignition characteristics of diesel fuels in compression ignition engines. The cetane number is determined at constant speed in a compression ignition test engine equipped with a swirl chamber.

The cetane number scale covers the range from 0 to 100, but typical testing is performed in the CN range from about 40 to about 75. The precision of this test method covers the CN range from 44 to about 66.

This document is applicable to distillate as well as paraffinic diesel fuels intended for use in diesel engines, including those containing up to a volume fraction of 10 % fatty-acid methyl esters (FAME), ignition-improvers or other diesel fuel additives.

When this engine test procedure is used for other fuels such as synthetics and vegetable oils, samples with fuel properties that interfere with the gravity-based pre-supply pressure to the fuel pump e.g. due to high viscosity can only be used to a limited extent. Precision data for such fuels are not available at this stage.

NOTE The test method is also suitable for determining cetane numbers outside the range of the scope; however, the precision statement only applies for fuels in the specified range.

WARNING — The use of this document can involve hazardous materials, operations and equipment. This document does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this document to take appropriate measures to ensure the safety and health of personnel prior to application of the document, and fulfil statutory and regulatory requirements for this purpose.

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 590, *Automotive fuels — Diesel — Requirements and test methods*

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

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

EN ISO 5165, *Petroleum products — Determination of the ignition quality of diesel fuels — Cetane engine method (ISO 5165)*