



# SLOVENSKI STANDARD

## oSIST prEN 16709:2022

01-julij-2022

---

### Goriva za motorna vozila - Dizelsko gorivo z visoko vsebnostjo FAME (B20 in B30) - Zahteve in preskusne metode

Automotive fuels - High FAME diesel fuel (B20 and B30) - Requirements and test methods

Kraftstoffe - Dieseldieselmischungen mit hohem FAME-Anteil (B20 und B30) - Anforderungen und Prüfverfahren

Carburants pour automobiles - Carburant diesel à haute teneur en EMAG (B20 et B30) - Exigences et méthodes d'essai

Ta slovenski standard je istoveten z: prEN 16709

<https://standards.iteh.ai/catalog/standards/sist/9cd5e9ca-73da-4a9a-bdec-4f9a1e8d50c8/osist-pren-16709-2022>

---

#### ICS:

75.160.20	Tekoča goriva	Liquid fuels
-----------	---------------	--------------

oSIST prEN 16709:2022

en

**iTeh STANDARD  
PREVIEW  
(standards.iteh.ai)**

oSIST prEN 16709:2022

<https://standards.iteh.ai/catalog/standards/sist/9cd5e9ca-73da-4a9a-bdec-4f9a1e8d50c8/osist-pren-16709-2022>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 16709**

June 2022

ICS 75.160.20

Will supersede EN 16709:2015+A1:2018

English Version

**Automotive fuels - High FAME diesel fuel (B20 and B30) -  
Requirements and test methods**

Carburants pour automobiles - Carburant diesel à  
haute teneur en EMAG (B20 et B30) ; Exigences et  
méthodes d'essai

Kraftstoffe - Dieselmischungen mit hohem  
FAME-Anteil (B20 und B30) - Anforderungen und  
Prüfverfahren

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 19.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

**Warning** : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

<b>Contents</b>	<b>Page</b>
European foreword.....	3
Introduction .....	4
1 Scope .....	5
2 Normative references .....	5
3 Terms and definitions .....	7
4 Captive fleet application .....	7
5 Sampling.....	7
6 Pump marking.....	7
7 Requirements and test methods.....	8
7.1 Dyes and markers .....	8
7.2 Additives.....	8
7.2.1 General.....	8
7.2.2 Methylcyclopentadienyl manganese tricarbonyl (MMT) .....	8
7.3 Fatty acid methyl ester (FAME).....	8
7.4 Other (bio-)components.....	9
7.5 Generally applicable requirements and related test methods.....	9
7.6 Climate dependent requirements and related test methods.....	11
7.7 Precision and dispute .....	12
Annex A (informative) A-deviations.....	14
Bibliography.....	15

ITeH STANDARD  
PREVIEW  
(standards.iteh.ai)

[osIST prEN 16709:2022](https://standards.iteh.ai/catalog/standards/sist/9cd5e9ca-73da-4a9a-bdec-4f9a1e8d50c8/osist-pren-16709-2022)

<https://standards.iteh.ai/catalog/standards/sist/9cd5e9ca-73da-4a9a-bdec-4f9a1e8d50c8/osist-pren-16709-2022>

## European foreword

This document (prEN 16709:2022) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 16709:2015+A1:2018.

Significant technical changes between this document and the previous edition are:

- 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 were required.
- Inclusion of the amended EN 14214 FAME specification.
- 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 ICN technique (EN 17155) has 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.
- 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.
- Updating of the Clause on Pump marking to harmonize it with other CEN/TC 19 specification standards.
- Update to the 'workmanship clause' in 7.5.2 to address the issue of abrasive wear of fuel injection equipment by hard particles in diesel fuel.
- Reduction of the minimum density limit for Grades D, E and F, moving the property from Table 1 and Table 2 to Table 3.
- Clarification of the dispute requirement concerning sulfur content in 7.7.3.
- Deletion of the allowance for cetane number alternative methods in 7.7.4.
- Addition of 7.7.10 to address situations in which the test method includes a bias-correction to the dispute method.
- Deletion of the A-deviation for Belgium and inclusion of an A-deviation for Germany, following changes of respective national legislations.

## Introduction

This document describes two fuel grades in the range of (14 – 20) % (V/V) and (24 – 30) % (V/V) of fatty acid methyl ester (FAME) in diesel fuel to be used in captive fleet application for designated vehicles<sup>1)</sup>, as it is not suitable for all vehicles.

Requirements following amendment 2003/17/EC [2], 2009/30/EC [3], 2011/63/EU [4] and 2014/77/EU [12] to the European Fuels Quality Directive 98/70/EC [1], are taken into account. Dates are included for normative test method references 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 at least the same accuracy and at least the same level of 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 [11].

Information on the development of this fuel specification can be found in CEN/TR 16557 [5].

# iTeh STANDARD PREVIEW (standards.iteh.ai)

oSIST prEN 16709:2022

<https://standards.iteh.ai/catalog/standards/sist/9cd5e9ca-73da-4a9a-bdec-4f9a1e8d50c8/osist-pren-16709-2022>

---

<sup>1)</sup> In the sense that they are compatible with the product.

## 1 Scope

This document specifies requirements and test methods for marketed and delivered high FAME (B20 and B30) diesel fuel for use in diesel engine vehicles designed or subsequently adapted to run on high FAME (B20 and B30) fuel. High FAME (B20 and B30) diesel fuel is a mixture of up to 20 % (V/V) in total and up to 30 % (V/V) in total respectively fatty acid methyl esters (commonly known as FAME) complying to EN 14214 and automotive diesel fuel complying to EN 590.

For maintenance and control reasons high FAME (B20 and B30) diesel fuel is to be used in captive fleets that are intended to have an appropriate fuel management (see Clause 4).

NOTE 1 This product is allowed in Europe [4], but national legislation can set additional requirements or rules concerning, or even prohibiting, marketing or delivering of the product.

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.

NOTE 3 In this document, A-deviations apply (see Annex A).

## 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, *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 15195:2019, *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*

**prEN 16709:2022 (E)**

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,<sup>2</sup> *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*

EN 17155:2018, *Liquid petroleum products - Determination of indicated cetane number (ICN) of middle distillate fuels - Primary reference fuels calibration method using a constant volume combustion chamber*

EN 17306:2019, *Liquid petroleum products - Determination of distillation characteristics at atmospheric pressure - Micro-distillation*

EN ISO 3015, *Petroleum and related products from natural or synthetic sources - Determination of cloud point (ISO 3015)*

EN ISO 2719, *Determination of flash point - Pensky-Martens closed cup method (ISO 2719)*

EN ISO 3104, *Petroleum products - Transparent and opaque liquids - Determination of kinematic viscosity and calculation of dynamic viscosity (ISO 3104)*

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

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

EN ISO 3405:2019, *Petroleum and related products from natural or synthetic sources - Determination of distillation characteristics at atmospheric pressure (ISO 3405:2019)*

EN ISO 3675:1998, *Crude petroleum and liquid petroleum products - Laboratory determination of density - Hydrometer method (ISO 3675:1998)*

EN ISO 3924:2019, *Petroleum products - Determination of boiling range distribution - Gas chromatography method (ISO 3924:2019)*

EN ISO 4259-2, *Petroleum and related products - Precision of measurement methods and results - Part 2: Interpretation and application of precision data in relation to methods of test (ISO 4259-2)*

EN ISO 5165:2020, *Petroleum products - Determination of the ignition quality of diesel fuels - Cetane engine method (ISO 5165:2020)*

EN ISO 6245, *Petroleum products - Determination of ash (ISO 6245)*

EN ISO 12185:1996, *Crude petroleum and petroleum products - Determination of density - Oscillating U-tube method (ISO 12185:1996)*

EN ISO 12937, *Petroleum products - Determination of water - Coulometric Karl Fischer titration method (ISO 12937)*

---

<sup>2</sup> standard under revision



EN ISO 13032:2012, *Petroleum products - Determination of low concentration of sulfur in automotive fuels - Energy-dispersive X-ray fluorescence spectrometric method (ISO 13032:2012)*

EN ISO 20846:2019, *Petroleum products - Determination of sulfur content of automotive fuels - Ultraviolet fluorescence method (ISO 20846:2019)*

EN ISO 20884:2019, *Petroleum products - Determination of sulfur content of automotive fuels - Wavelength-dispersive X-ray fluorescence spectrometry (ISO 20884:2019)*

EN ISO 22995, *Petroleum products - Determination of cloud point - Automated step-wise cooling method (ISO 22995)*

ISO 23581, *Petroleum products and related products — Determination of kinematic viscosity — Method by Stabinger type viscometer*

### 3 Terms and definitions

No terms and definitions are listed in this document.

### 4 Captive fleet application

This document is intended to cover fuels for use in captive fleet application for designated vehicles. Captive fleet is defined as a group of vehicles that use dedicated facilities and logistics for supply and storage of their fuel only accessible for them. The vehicles shall receive adequate maintenance as part of an organization or group agreement with the vehicle supplier(s).

NOTE 1 The fleet is usually operated by a single organization, but might also be operated by a consortium of professional vehicle owners.

NOTE 2 The fact that they are dedicated implies that fuel facilities are clearly identified as differing from public fuel facilities, by separate placement, and to which accessibility is limited to only captive fleet users.

### 5 Sampling

Samples shall be taken as described in EN ISO 3170 or EN ISO 3171, whereas requirements of national standards or regulations for the sampling of automotive diesel fuel should be taken. The national requirements shall be set out in detail or shall be referred to by reference in a National Annex to this document.

In view of the sensitivity of some of the test methods referred to in this document, particular attention shall be paid to compliance with any guidance on sampling containers which is included in the test method standard.

### 6 Pump marking

Information to be marked on dispensing pumps and nozzles used for delivering high FAME (B20 and B30) diesel fuel, and the dimensions of the mark shall be in accordance with EN 16942.

Labelling shall be clearly visible, easily legible and displayed at any point where high FAME (B20 – B30) diesel fuel with metallic additives is made available to consumers. The label shall contain: “Contains metallic additives” in the national language(s) and shall be laid down in the National Annex to this document.

Further indication on dispensing pumps in the national language of “Not suitable for all vehicles” is also strongly recommended.

## 7 Requirements and test methods

### 7.1 Dyes and markers

The use of dyes or markers is allowed.

### 7.2 Additives

#### 7.2.1 General

In order to improve the performance quality, the use of additives is allowed. Suitable fuel additives without known harmful side-effects are recommended, in the appropriate amount, to help to avoid deterioration of driveability and emissions control durability. Other technical means with equivalent effect may also be used.

NOTE Deposit forming tendency test methods suitable for routine control purposes have not yet been identified and developed.

#### 7.2.2 Methylcyclopentadienyl manganese tricarbonyl (MMT)

When methylcyclopentadienyl manganese tricarbonyl (MMT) is used, a specific labelling is required (see also Clause 6). The presence of the MMT is limited via a manganese content limit as in Tables 1 and 2.

### 7.3 Fatty acid methyl ester (FAME)

High FAME (B20 and B30) fuel may contain from 14,0 % (V/V) up to 20,0 % (V/V) or from 24,0 % (V/V) up to 30,0 % (V/V) of FAME complying with EN 14214:2012+A2:2019.

Climate dependent requirements for FAME as a blending component for use in high FAME (B20 and B30) fuel according to this document are set out in EN 14214:2012+A2:2019, 5.4.3. The specific grades shall be specified on a national basis according to local climatic conditions and the FAME volume in the diesel fuel.

The finished blend of high FAME (B20 and B30) fuel shall also comply with the climate dependent requirements set out in 7.6 of this document.

Cold flow additives, when used in FAME, should be specifically matched to the base diesel fuel and FAME quality to ensure correct performance consistent with the requirements set out in this document. The choice could result in incompatibility between the cold flow additives used in the FAME and the diesel fuel. The choice of cold flow additive technology should be a contractual matter between the fuel blender and the FAME supplier taking into account the climatic-dependent requirements of the finished high FAME (B20 and B30) fuel.

NOTE Cold flow requirements for FAME as a blend component in high FAME (B20 and B30) fuel are set out in Tables 3 and 4 and the National Annex of EN 14214:2012+A2:2019, in order to control maximum content of saturated monoglycerides in the final high FAME (B20 and B30) diesel fuel to ensure trouble-free operation. Work is ongoing to identify a suitable test method for saturated monoglycerides or a performance test to control this aspect of low temperature performance.

In order to improve the oxidation stability of FAME, it is strongly recommended to add oxidation stability enhancing additives to FAME at the production stage and before storage, providing an oxidation stability similar to that obtained with 1 000 mg/kg of 2,6-di-tert-butyl-4-hydroxytoluene (BHT, officially designated by IUPAC as 2,6-bis(1,1-dimethylethyl)-4-methylphenol).

The similar action may be read as providing oxidation stability performance at least equal to that obtained with 1 000 mg/kg of BHT.