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**BSI Standards Publication**

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

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## National foreword

This British Standard is the UK implementation of EN 12916:2019, incorporating corrigenda June 2019. It supersedes BS EN 12916:2016, which is withdrawn.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 2019  
Published by BSI Standards Limited 2019

ISBN 978 0 539 05449 1

ICS 75.080

**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 31 May 2019.

### Amendments/corrigenda issued since publication

Date	Text affected
31 August 2019	Implementation of CEN correction notice 12 June 2019 and CEN correction notice 26 June 2019: corrections made to clause 13.1 (first paragraph) and Bibliography

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## EUROPÄISCHE NORM

May 2019

ICS 75.080

Supersedes EN 12916:2016

English Version

# Petroleum products - Determination of aromatic hydrocarbon types in middle distillates - High performance liquid chromatography method with refractive index detection

Produits pétroliers - Détermination des familles d'hydrocarbures aromatiques dans les distillats moyens - Méthode par chromatographie liquide à haute performance avec détection par réfractométrie différentielle

Mineralölerzeugnisse - Bestimmung von aromatischen Kohlenwasserstoffgruppen in Mitteldestillaten - Hochleistungsflüssigkeitschromatographie-Verfahren mit Brechzahl-Detektion

This European Standard was approved by CEN on 15 April 2019.

This European Standard was corrected and reissued by the CEN-CENELEC Management Centre on 26 June 2019.

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, Serbia, 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: Rue de la Science 23, B-1040 Brussels**

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## European foreword

This document (EN 12916:2019) 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 November 2019, and conflicting national standards shall be withdrawn at the latest by November 2019.

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 12916:2016.

Major change compared to the previous version is the addition of a procedure for the analysis of very low contents of aromatics in paraffinic diesel fuels. The method now comprises two procedures, A and B. Procedure A covers diesel fuels and other distillates. Procedure B is set up for paraffinic diesel fuels which do not require a dilution step. Both procedures have a separate precision statement. Additionally, the required accuracy of the weighing of the system calibration standards 1 and 2 was increased from 0,001 g to 0,000 1 g.

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

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## 1 Scope

This document specifies a test method for the determination of the content of mono-aromatic, di-aromatic and tri+-aromatic hydrocarbons in diesel fuels, paraffinic diesel fuels and petroleum distillates.

This document defines two procedures, A and B.

Procedure A is applicable to diesel fuels that may contain fatty acid methyl esters (FAME) up to 30 % (V/V) (as in [1], [2] or [3]) and petroleum distillates in the boiling range from 150 °C to 400 °C (as in [4]).

Procedure B is applicable to paraffinic diesel fuels with up to 7 % (V/V) FAME. This procedure does not contain a dilution of the sample in order to determine the low levels of aromatic components in these fuels.

The polycyclic aromatic hydrocarbons content is calculated from the sum of di-aromatic and tri+-aromatic hydrocarbons and the total content of aromatic compounds is calculated from the sum of the individual aromatic hydrocarbon types.

Compounds containing sulfur, nitrogen and oxygen can interfere in the determination; mono-alkenes do not interfere, but conjugated di-alkenes and poly-alkenes, if present, can do so.

NOTE 1 For the purpose of this European Standard, the terms "% (m/m)" and "% (V/V)" are used to represent the mass fraction,  $\mu$ , and the volume fraction,  $\varphi$ , of a material respectively.

NOTE 2 By convention, the aromatic hydrocarbon types are defined on the basis of their elution characteristics from the specified liquid chromatography column relative to model aromatic compounds. Their quantification is performed using an external calibration with a single aromatic compound for each of them, which may or may not be representative of the aromatics present in the sample. Alternative techniques and test methods may classify and quantify individual aromatic hydrocarbon types differently.

NOTE 3 Backflush is part of laboratory-internal maintenance.

**WARNING** — The use of this standard can involve hazardous materials, operations and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of users of this standard to take appropriate measures to ensure the safety and health of personnel prior to application of the standard, 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 14214, *Liquid petroleum products — Fatty acid methyl esters (FAME) for use in diesel engines and heating applications — Requirements and test methods*

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

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

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