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Irish Standard
I.S. EN 18051:2024

Version 1.00

Automotive fuels - Determination of content of butoxybenzene in middle distillates - Gas chromatographic method using a flame ionization detector (GC-FID)

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National Foreword

I.S. EN 18051:2024 V1.00 is the version of the NSAI adopted European document EN 18051:2024, *Automotive fuels - Determination of content of butoxy-benzene in middle distillates - Gas chromatographic method using a flame ionization detector (GC-FID),* including any Corrections, Amendments etc. to EN 18051:2024 listed on page(s) II.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 18051

December 2024

ICS 75.160.20; 75.160.40

English Version

Automotive fuels - Determination of content of butoxybenzene in middle distillates - Gas chromatographic method using a flame ionization detector (GC-FID)

Carburants pour automobiles - Détermination de la teneur en butoxybenzène dans les distillats moyens - Méthode par chromatographie en phase gazeuse utilisant un détecteur à ionisation de flamme (CPG-DIF)

Kraftstoffe - Bestimmung des Gehalts von Butoxybenzol in Mitteldestillaten - Gaschromatographisches Verfahren mit Flammenionisationsdetektor (GC-FID)

This European Standard was approved by CEN on 6 October 2024.

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European foreword

This document (EN 18051:2024) 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of an identical text or by endorsement, at the latest by June 2025, and conflicting national standards shall be withdrawn at the latest by June 2025.

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 supports implementation in the market of the Decision [1] of the European Commission with regards to common distillate fuel marking.

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.

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Introduction

For the proper functioning of the internal market, the European Commission has established Directives providing for a common marking system to identify gas oils and kerosene, which have been released for consumption exempt from excise duty, or which are subject to a reduced excise duty rate. In a review in 2019, the Commission's evaluation identified the shortcomings of the actual marker (Solvent Yellow 124) in terms of its lack of resilience to common removal methods.

Consequently, a new, colourless chemical marker, Butoxybenzene (CAS Registry Number 1126-79-0), was chosen to replace Solvent Yellow 124 as of 18 January 2024. This product or fiscal marker is commercially available as ACCUTRACE™ PLUS[1] from DOW.

At the time of publication of the decision [1], a gas chromatography technique using a mass spectrometer (GC-MS) as detector was promoted by DOW. That technique didn't have a full precision. The first contacts in 2022 with the European Commission and the EU Customs laboratories led CEN to conclude that the GC-MS would not be further standardized.

This document has then been developed to present a simpler alternative to the market compared to the GC-MS method.

The test method described in this document is based on a standard [2] previously prepared for a former fuel marker, ACCUTRACE™ S101 (3-secbutyl-4-decyloxyphenylmethanetriyltribenzene), which is used in a few European countries.

At the time of developing an interlaboratory study to determine method precision, the EU Customs laboratories (CLEN) expressed the intention to also study an improvement of the GC-MS method. CLEN and CEN used the same samples to develop precision. Bias against the ILIAD 606 method [3] has not been determined.

[1] Accutrace PLUS and ACCUTRACE S10 are the trade names of products supplied by DOW Chemicals. This information is given for the convenience of users of this document and does not constitute an endorsement by CEN of the product named. Equivalent products may be used.

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1 Scope

This document specifies a test method for the determination of the content of n-butyl phenyl ether (BPE, CAS: 1126-79-0, also known as butoxy-benzene) in gas oils, kerosene, diesel fuel and biodiesel blends. The method uses a two-column gas chromatograph with an FID-type of detector. The application range is 0,1 mg/l to 21,25 mg/l of BPE, with a limit of detection of 0,05 mg/l.

NOTE This corresponds to 1 % to 150 % of the average marking level of the ACCUTRACE™ Plus required by Commission Implementing Decision (EU) 2022/197 [1] of 17 January 2022 establishing a common fiscal marker for gas oils and kerosene.

The method is found to be applicable to determinations beyond this range or for specific other chemical markers that fall within the distillation temperature range of middle-distillates, but for that no precision has been determined.

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 establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

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

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

3 Terms, definitions and abbreviations

3.1 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at https://www.iso.org/obp
- IEC Electropedia: available at https://www.electropedia.org/

3.2 Abbreviations

BPE	n-butyl phenyl ether
FID	flame ionization detector
GC	gas chromatograph
LWS	linearity working solution
MS	mass spectrometry
RF	absolute response factor
SCS	stock calibration solution
WCS	Working calibration solution

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