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Responsible committee: PTI/13 Petroleum Testing and Terminology

Interested committees:

Title: Draft BS EN 13016-3 Liquid petroleum products - Vapour pressure. Part 3: Determination of vapour pressure and calculated dry vapour pressure equivalent (DVPE) (Triple expansion method).

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard

- i) has any issues related to 3rd party IPR, patent or copyright
- ii) affects other national standard(s)
- iii) requires additional national guidance or information

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This draft is issued to allow comments from interested parties; all comments will be given consideration prior to publication. No acknowledgement will normally be sent. **See overleaf for information on the submission of comments.**

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Full document details: 23/30471423 DC

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

English Version

Liquid petroleum products - Vapour pressure - Part 3:
Determination of vapour pressure and calculated dry
vapour pressure equivalent (DVPE) (Triple expansion
method)

Produits pétroliers liquides - Pression de vapeur -
Partie 3 : Détermination de la pression de vapeur et de
la pression de vapeur sèche équivalente calculée
(PVSE) (Méthode triple expansion)

Flüssige Mineralölerzeugnisse - Dampfdruck - Teil 3:
Bestimmung des Dampfdruckes und des berechneten
dem trockenen Dampfdruck entsprechenden Druckes
(DVPE) (Dreifach-Expansionsmethode)

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.

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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

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Contents	Page
European foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Principle	6
5 Reagents and materials.....	6
6 Apparatus.....	7
7 Sampling.....	8
8 Sample preparation.....	8
9 Preparation of apparatus	9
10 Calibration of apparatus.....	9
10.1 Pressure transducer.....	9
10.2 Temperature measuring device.....	10
11 Verification of apparatus.....	10
11.1 Reference fluid check	10
11.2 Quality control checks	11
12 Procedure.....	11
13 Calculation	12
14 Expression of results.....	13
15 Precision.....	13
15.1 General.....	13
15.2 Repeatability, r	13
15.3 Reproducibility, R	13
16 Test report.....	14
Annex A (normative) Accepted reference values	15
Annex B (normative) Precision and relative bias using 1 000 ml containers	17
B.1 Precision.....	17
B.1.1 General.....	17
B.1.2 Repeatability, r	17
B.1.3 Reproducibility, R	17
B.2 Relative bias between 250 ml and 1 000 ml containers	17
B.3 DVPE correlation formula	18
Bibliography.....	19

European foreword

This document (prEN 13016-3:2023) 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 document is currently submitted to the CEN Enquiry.

This document will supersede EN 13016-3:2018.

The main changes compared to the previous edition EN 13016-3:2018 are listed below:

- updated safety warning;
- revised 15.1 to include 250 ml and 1 000 ml sample details;
- updated 15.2 and 15.3 text;
- updated Clause 6 Apparatus traceability requirements;
- new Annex B giving precision for 1 000 ml containers;
- new reagents in 5.4, 5.5, Clause 11 and Annex A for verification purposes.

EN 13016 consists of the following parts, under the general title *Liquid petroleum products — Vapour pressure*:

- Part 1: Determination of air saturated vapour pressure (ASVP) and calculated dry vapour pressure equivalent (DVPE);
- Part 2: Determination of absolute pressure (AVP) between 40 C and 100 C;
- Part 3: Determination of vapour pressure and calculated dry vapour pressure equivalent (DVPE) (Triple Expansion Method).

This part is based on and developed in parallel with IP 619 [9] and ASTM D6378 [3].

Introduction

Vapour pressure is used as a classification criterion for the safe handling and carriage of petroleum products, feedstocks and components; it has a relationship to the potential for hydrocarbon emissions, under uncontrolled conditions, and thus is the subject of environmental scrutiny.

Vapour pressure limitations are often imposed to prevent pump cavitation during transfer operations.

Vapour pressure is one measure of the volatility characteristics of fuels used in many differing types of engines with large variations in operating temperatures. Fuels having a high vapour pressure can vaporize too readily in the fuel handling systems, resulting in decreased flow to the engine and possible stoppage by vapour lock. Conversely, fuels of low vapour pressure vaporize not readily enough, resulting in difficult starting, slow warm-up and poor acceleration.

1 Scope

This document specifies a method for the determination of the vapour pressure, exerted *in vacuo*, by volatile, low viscosity petroleum products, components, ethanol blends up to 85 % (V/V), and feedstocks using a variable volume chamber. A dry vapour pressure equivalent (DVPE) is calculated from the vapour pressure.

The conditions used in the test described in this document are a vapour-to-liquid ratio of 4:1 and a test temperature of 37,8 °C.

The equipment is not wetted with water during the test, and the method described is therefore suitable for testing samples with or without oxygenates; no account is taken of dissolved water in the sample.

This procedure calculates the partial pressure of the air dissolved in the test portion during the triple expansion process. It is suitable for samples with a DVPE between 15,7 kPa and 97,6 kPa; vapour pressures outside this range can be measured but the precision has not been determined.

This document is applicable to fuels containing oxygenated compounds up to the limits stated in the relevant Council Directive 85/536/EEC [6], and for ethanol-fuel blends up to 85 % (V/V) ethanol.

NOTE For the purposes of this document, the terms “% (m/m)” and “% (V/V)” are used to represent the mass and volume fractions respectively.

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 users of this document to take appropriate measures to ensure the safety and health of personnel prior to application of the standard, and to determine the applicability of any further restrictions for this purpose.

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 13016-1, *Liquid petroleum products — Vapour pressure — Part 1: Determination of air saturated vapour pressure (ASVP) and calculated dry vapour pressure equivalent (DVPE)*

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

vapour pressure

VP

total pressure minus the partial pressure of the dissolved air in the liquid at a vapour to liquid ratio of 4:1 and at 37,8 °C