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STN	**Kvapalné ropné výrobky Tlak pár Časť 3: Určovanie tlaku pár a výpočet ekvivalentu tlaku suchých pár (DVPE) (Metóda trojnásobnej expanzie)**	**STN EN 13016-3** 65 6083

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

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

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 07/25

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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 European Standard was approved by CEN on 14 March 2025.

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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.

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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 13016-3:2025) 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of an identical text or by endorsement, at the latest by October 2025, and conflicting national standards shall be withdrawn at the latest by October 2025.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 supersedes EN 13016-3:2018.

EN 13016-3:2025 includes the following significant technical changes with respect to EN 13016-3:2018:

— 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 normative Annex B giving precision for 1 000 ml containers;

— new reagents in 5.4, 5.5, Clause 11 and new normative Annex A for verification purposes.

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

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.

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].

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

ISO 4259-4, *Petroleum and related products — Precision of measurement methods and results — Part 4: Use of statistical control charts to validate 'in-statistical-control' status for the execution of a standard test method in a single laboratory*