Liquid petroleum products - Vapour pressure - Part 2: Determination of absolute pressure (AVP) between 40 ºC and 100 ºC

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EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 13016-2:2007 sisaldab Euroopa standardi EN 13016-2:2007 ingliskeelset teksti. Käesolev dokument on jõustatud 22.11.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 13016-2:2007 consists of the English text of the European standard EN 13016-2:2007. This document is endorsed on 22.11.2007 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This European Standard specifies a method for the determination of absolute vapour pressure of liquid petroleum products at elevated temperatures. The conditions used in the test described in this standard are a vapour to liquid ratio of 3:2 and an initial injection temperature of 37,8 °C or 30,0 °C. The method described is suitable for testing air-saturated samples that exert an air-saturated vapour pressure of between 9 kPa and 500 kPa at temperatures between 40 °C and 100 °C. This European Standard is applicable to fuels containing oxygenated compounds up to the limits stated in the relevant EC Directive 85/536/EEC [3].	**Scope:** This European Standard specifies a method for the determination of absolute vapour pressure of liquid petroleum products at elevated temperatures. The conditions used in the test described in this standard are a vapour to liquid ratio of 3:2 and an initial injection temperature of 37,8 °C or 30,0 °C. The method described is suitable for testing air-saturated samples that exert an air-saturated vapour pressure of between 9 kPa and 500 kPa at temperatures between 40 °C and 100 °C. This European Standard is applicable to fuels containing oxygenated compounds up to the limits stated in the relevant EC Directive 85/536/EEC [3].

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Produits pétroliers liquides - Pression de vapeur - Partie 2 : Détermination de la pression de vapeur absolue (PVA) entre 40 °C et 100 °C

Flüssige Mineralölerzeugnisse - Dampfdruck - Teil 2: Bestimmung des absoluten Dampfdruckes (AVP) im Temperaturbereich zwischen 40 °C und 100 °C

This European Standard was approved by CEN on 28 July 2007.

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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 Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Contents

Page

Foreword

This document (EN 13016-2:2007) 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 March 2008, and conflicting national standards shall be withdrawn at the latest by March 2008.

This document supersedes EN 13016-2:2000, which has been revised editorially to clarify a number of steps related to sampling, calibration of the pressure transducer and the procedure. No new precision evaluations have been carried out. The equation to calculate the absolute vapour pressure in the informative Annex A has been corrected.

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 vapour pressure (AVP) between 40 °C and 100 °C.*

Part 1 is based on and developed in parallel with IP 394 [1] and ASTM D 5191 [2]. It describes a general determination method, whereas this part describes one at elevated temperatures.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard : Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and 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 may 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 may not vaporize readily enough, resulting in difficult starting, slow warm-up and poor acceleration.

1 Scope

This European Standard specifies a method for the determination of absolute vapour pressure of liquid petroleum products at elevated temperatures.

The conditions used in the test described in this standard are a vapour to liquid ratio of 3:2 and an initial injection temperature of 37,8 °C or 30,0 °C.

The method described is suitable for testing air-saturated samples that exert an air-saturated vapour pressure of between 9 kPa and 500 kPa at temperatures between 40 °C and 100 °C.

This European Standard is applicable to fuels containing oxygenated compounds up to the limits stated in the relevant EC Directive 85/536/EEC [3].

NOTE 1 If a sample injection is into a test chamber which is raised to 37,8 °C and the vapour to liquid ratio is 4:1, the initial measurement corresponds with the measurement in Part 1 of this standard.

NOTE 2 For the purposes of this European Standard, the term "% (*V/V*)" is used to represent the volume fraction.

WARNING — Use of this standard may 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 the user of this standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

2 Normative references

The following referenced documents are indispensable for the application 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 3170:2004)*

3 Terms and definitions

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

3.1
air-saturated vapour pressure
total pressure
ASVP
observed pressure exerted in vacuo by the partial pressure of air-saturated petroleum products, components and feedstocks, in the absence of non-dissolved water, and the partial pressure of the dissolved air

3.2
absolute vapour pressure
AVP
air-saturated vapour pressure minus the partial pressure due to dissolved air in the liquid

4 Principle

A cooled air-saturated sample of known volume is introduced into an evacuated, temperature-controlled chamber in two equal test portions. The volume of the chamber is five times that of the sample introduced to provide a vapour-to-liquid ratio of 4:1. The vapour-to-liquid ratio following the second injection is 3:2. After