SLOVENSKI STANDARD
SIST EN ISO 3405:2000

01-julij-2000

Naftni proizvodi - Določ evanje destilacijskih znač ilnosti pri tlač ni atmosferi (ISO 3405:2000)

Petroleum products - Determination of distillation characteristics at atmospheric pressure (ISO 3405:2000)

Mineralölerzeugnisse - Bestimmung des Destillationsverlaufes bei Atmosphärendruck (ISO 3405:2000)

Produits pétroliers - Détermination des caractéristiques de distillation a pression atmosphérique (ISO 3405:2000)

Ta slovenski standard je istoveten z: **EN ISO 3405:2000**

ICS:

75.080	Naftni proizvodi na splošno	Petroleum products in general

SIST EN ISO 3405:2000 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 3405

March 2000

ICS 75.080

English version

Petroleum products - Determination of distillation characteristics at atmospheric pressure (ISO 3405:2000)

Produits pétroliers - Détermination des caractéristiques de distillation à pression atmosphérique (ISO 3405:2000)

Mineralölerzeugnisse - Bestimmung des Destillationsverlaufes bei Atmosphärendruck (ISO 3405:2000)

This European Standard was approved by CEN on 1 March 2000.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Foreword

Corrected 2001-05-09

The text of the International Standard ISO 3405:2000 has been prepared by Technical Committee ISO/TC 28 "Petroleum products and lubricants" in collaboration with Technical Committee CEN/TC 19 "Petroleum products, lubricants and related products", 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 September 2000, and conflicting national standards shall be withdrawn at the latest by September 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 3405:2000 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to International Standards are listed in annex ZA (normative).

Annex ZA (normative)
Normative references to international publications with their relevant European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE Where an International Publication has been modified by common modifications, indicated by (mod.), the relevant EN/HD applies.

Publication	Year	Title	EN	Year
ISO 3170	1988	Petroleum liquids - Manual sampling (including Amendment 1:1998)	EN ISO 3170	1998
ISO 3171	1988	Petroleum liquids - Automatic pipeline sampling	EN ISO 3171	1999

INTERNATIONAL STANDARD

ISO 3405

Third edition
2000-03-01

Petroleum products — Determination of distillation characteristics at atmospheric pressure

Produits pétroliers — Détermination des caractéristiques de distillation à pression atmosphérique

Reference number
ISO 3405:2000(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 734 10 79
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 3405 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*.

This third edition cancels and replaces the second edition (ISO 3405:1988), of which it constitutes a technically revision.

Annexes A and B form a normative part of this International Standard. Annexes C, D and E are for information only.

Petroleum products — Determination of distillation characteristics at atmospheric pressure

WARNING — The use of this International Standard may involve hazardous materials, operations and equipment. This International Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this International Standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

1 Scope

This International Standard specifies a laboratory method for the determination of the distillation characteristics of light and middle distillates derived from petroleum with initial boiling points above 0 °C and end-points below approximately 400 °C, utilizing either manual or automated equipment, with the manual procedure being the referee method in cases of dispute, unless otherwise agreed.

NOTE The method is applicable to petroleum products incorporating a minor constitution of components from non-petroleum origin, but the precision data may not apply in all cases.

The distillation (volatility) characteristics of hydrocarbons have an important effect on their safety and performance, especially in the case of fuels and solvents. The boiling range gives important information on composition and behaviour during storage and use, and the rate of evaporation is an important factor in the application of many solvents. Limiting values to specified distillation characteristics are applied to most distillate petroleum product specifications in order to control end-use performance and to regulate the formation of vapours which may form explosive mixtures with air, or otherwise escape into the atmosphere as emissions (VOC).

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 918:1983, *Volatile organic liquids for industrial use — Determination of distillation characteristics*.

ISO 3170:1988, *Petroleum liquids — Manual sampling*.

ISO 3171:1988, *Petroleum liquids — Automatic pipeline sampling*.

ISO 4259:1992, *Petroleum products — Determination and application of precision data in relation to methods of test*.

ISO 4788:1980, *Laboratory glassware — Graduated measuring cylinders*.

3 Terms and definitions

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

3.1
decomposition point
thermometer reading (corrected) which coincides with the first indications of thermal decomposition of the liquid in the flask

NOTE Characteristic indications of thermal decomposition are an evolution of fumes and erratic thermometer readings which usually show a decided decrease after any attempt has been made to adjust the heat.

3.2
dry point
thermometer reading (corrected) that is observed at the instant the last drop of liquid evaporates from the lowest point in the flask; any drops or film of liquid on the side of the flask or on the thermometer are disregarded

NOTE The end-point (final boiling point), rather than the dry point is intended for general use. The dry point can be reported in connection with special purpose naphthas, such as those used in the paint industry. Also, it is substituted for the end-point (final boiling point) whenever the sample is of such a nature that the precision of the end-point cannot consistently meet the requirements given in clause 12.

3.3
end-point
final boiling point
maximum thermometer reading (corrected) obtained during the test

NOTE This usually occurs after evaporation of all liquid from the bottom of the flask.

3.4
initial boiling point
thermometer reading (corrected) that is observed at the instant that the first drop of condensate falls from the lower end of the condenser tube

3.5
percent evaporated
sum of the percent recovered and the percent loss

3.6
percent loss
100 minus the total recovery

NOTE Sometimes called “front-end loss”; this is the amount of uncondensed material lost in the initial stages of the distillation.

3.7
corrected loss
percent loss corrected for barometric pressure

3.8
percent recovered
volume of condensate observed in the receiving graduated cylinder at any point in the distillation, expressed as a percentage of the charge volume, in connection with a simultaneous temperature reading

3.9
percent recovery
maximum percent recovered, as observed in accordance with 9.10

3.10
percent residue
volume of residue measured in accordance with 9.11, and expressed as a percentage of the charge volume

3.11
percent total recovery
combined percent recovery and residue in the flask, as determined in accordance with 10.1

3.12
thermometer reading
temperature recorded by the sensor of the saturated vapour measured in the neck of the flask below the vapour tube, under the specified conditions of this test

3.13
temperature reading
thermometer or temperature-measurement device reading (3.12) which is corrected to 101,3 kPa barometric pressure

3.14
emergent stem effect
offset in temperature reading caused by the use of a total immersion mercury-in-glass thermometer in the partial immersion mode

NOTE The emergent part of the mercury column is at a lower temperature than the immersed portion, resulting in a lower temperature reading than that obtained when the thermometer was completely immersed for calibration.

3.15
temperature lag
offset in temperature reading between a mercury-in-glass thermometer and an electronic temperature-measurement device, caused by the different response time of the systems involved

4 Principle

The sample is assigned into one of five groups based on its composition and expected volatility characteristics, each group defining the apparatus arrangement, condenser temperature and operational variables. A 100 ml test portion is distilled under the specified conditions appropriate to the group into which the sample falls, and systematic observations of thermometer readings and volumes of condensate recovered are made. The volume of the residue in the flask is measured, and the loss on distillation recorded. The thermometer readings are corrected for barometric pressure, and the data are then used for calculations appropriate to the nature of the sample and the specification requirements.

5 Apparatus

5.1 General

Typical assemblies of the manual apparatus are shown in Figures 1 and 2.

5.2 Distillation flasks

The distillation flasks shall have a capacity of 100 ml or 125 ml and be constructed of heat-resistant glass, according to the dimensions and tolerances shown in Figures 3 and 4.

NOTE For tests specifying the dry point, especially selected flasks with bottoms and walls of uniform thickness are desirable.