

# SLOVENSKI STANDARD

## SIST EN ISO 3170:1999

01-november-1999

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Petroleum liquids - Manual sampling (ISO 3170:1988, including Amendment 1:1998)

Flüssige Mineralölerzeugnisse - Manuelle Probenahme (ISO 3170:1998 einschließlich Änderung 1:1998)

Produits pétroliers liquides - Echantillonnage manuel (ISO 3170:1998), amendement 1:1998 inclus)

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Ta slovenski standard je istoveten z: **EN ISO 3170:1998**

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**ICS:**

75.080	Naftni proizvodi na splošno	Petroleum products in general
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN ISO 3170

September 1998

ICS 75.080

Descriptors: see ISO document

English version

Petroleum liquids - Manual sampling (ISO 3170:1988, including  
Amendment 1:1998)

Produits pétroliers liquides - Echantillonnage manuel (ISO  
3170:1988, amendement 1:1998 inclus)

Flüssige Mineralölzeugnisse - Manuelle Probenahme  
(ISO 3170:1988 einschließlich Änderung 1:1998)

This European Standard was approved by CEN on 20 September 1998.

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 Central Secretariat 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 Central Secretariat 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.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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## Foreword

The text of the International Standard from Technical Committee ISO/TC 28 "Petroleum products and lubricants" of the International Organization for Standardization (ISO) has been taken over as an European Standard by Technical Committee CEN/TC 19 "Petroleum products, lubricants and related products", the secretariat of which is held by NNI.

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 1999, and conflicting national standards shall be withdrawn at the latest by March 1999.

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 3170:1988, including Amendment 1:1998 has been approved by CEN as a European Standard without any modification.

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COMPLIANT WITH THE EN ISO 3170  
Standard of (CEN/TC 19) EN 3170  
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# INTERNATIONAL STANDARD

ISO  
3170

Second edition  
1988-09-01



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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION  
ORGANISATION INTERNATIONALE DE NORMALISATION  
МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

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## Petroleum liquids — Manual sampling

*Produits pétroliers liquides — Échantillonnage manuel*

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## ISO 3170 : 1988 (E)

## 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 3170 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*.

This second edition cancels and replaces the first edition (ISO 3170 : 1975), of which it constitutes a technical revision. It also includes a procedure for transfer and subsequent handling of the sample to ensure delivery of a representative portion thereof into laboratory apparatus or storage for possible reconciliation.

Annex A of this International Standard is for information only.



## Introduction

This International Standard should be applied in combination with ISO 3171, *Petroleum liquids — Automatic pipeline sampling*.

The purpose of this International Standard is to standardize conditions for obtaining a sample of liquid/semi-liquid hydrocarbons from a tank, drum or pipeline. If the hydrocarbon materials to be sampled are of non-homogeneous character showing significant variations in composition or containing sediments and water, samples taken manually should not be expected to be representative, but enable the degree of non-homogeneity to be assessed and estimates of quality and quantity to be made.

It is realized that in many countries some or all of the items covered by this International Standard are the subject of mandatory regulations imposed by the laws of those countries; such regulations must be rigorously observed. In cases of conflict between such mandatory regulations and this International Standard, the former shall prevail.

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# Petroleum liquids — Manual sampling

## 1 Scope

**1.1** This International Standard specifies the procedures to be used for obtaining, by manual methods, samples of liquid hydrocarbons, tank residues and deposits from fixed tanks, railcars, road vehicles, ships and barges, drums and cans, or from liquids being pumped in pipelines (see 4.3).

**1.2** It applies to the sampling of liquid petroleum products, crude oils and intermediate products, which are stored in tanks at or near atmospheric pressure, or transferred by pipelines, and are handled as liquids at temperatures from near ambient up to 100 °C.

The sampling procedures specified are not intended for the sampling of special petroleum products which may be the subject of other International Standards, such as aviation fuels, electrical insulating oils, liquefied petroleum gases, liquefied natural gases, bitumen and chemical products, nor to unstabilized crude oils having a Reid vapour pressure above 180 kPa (1,8 bar).

**1.3** Two basic manual sampling methods are available:

- tank sampling;
- pipeline sampling.

When a batch is received or consigned, either tank or pipeline sampling, or both, may be possible. However, if both methods are used, the two sets of samples shall not be mixed.

**1.4** Procedures are specified which minimize or eliminate losses of light ends from samples. Such losses can occur during handling or transfer of samples thereby making them non-representative of the bulk material.

**1.5** If the procedures intended for obtaining representative samples of stocks or movements of homogeneous petroleum

liquids are applied to non-homogeneous liquids having significant variations in composition or containing sediments and/or water, the samples may not be representative.

**1.6** The sampling procedures specified are intended to provide samples for the following purposes:

- a) the determination of the oil quality;
- b) the determination of the water content of the oils;
- c) the determination of other contaminants that are not considered to be part of the liquid transferred.

If the sampling conditions for the purposes a), b) and c) are in conflict, separate samples are required.

**1.7** Sampling procedures for tank contents that are not homogeneous are specified that enable the degree of non-homogeneity to be assessed and estimates of quality and quantity to be made.

**1.8** Procedures for the sampling of residues and deposits in tanks are included, together with techniques for liquid hydrocarbons under inert gas pressure.

## 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

## ISO 3170 : 1988 (E)

## 3 Definitions

**3.1 competent person** : A person who, by reason of his or her training, experience and theoretical and practical knowledge, is able to detect any defects or weaknesses in the plant or equipment and to make an authoritative judgement as to its suitability for further use.

NOTE — This person should have sufficient authority to ensure that the necessary action is taken following his or her recommendations.

**3.2 integrity of the sample** : The condition of being complete and unaltered, i.e. the sample being preserved with the same composition as when it was taken from the bulk of the liquid.

**3.3 mixer** : A device which provides a homogeneous mixture of the liquid within a pipeline or container in order to obtain a representative sample.

**3.3.1 static mixer** : A mixing device having no moving parts and located within a pipe or tube. It depends on the kinetic energy of the moving liquid for the energy required to mix the liquid.

**3.4 pipeline** : Any section of pipe used for the transfer of liquid. An unobstructed pipe does not have any internal fittings such as a static mixer or orifice plate.

**3.5 residues and deposits** : Organic and inorganic material, together with any water dispersed within it, which has separated from the liquid and either

- a) fallen to the bottom of the tank containing the liquid, or
- b) been left in the tank after the liquid has been pumped out.

**3.6 sample conditioning** : Homogenization necessary to stabilize the sample during sample handling in preparation for analysis.

**3.7 sample handling** : The conditioning, transferring, dividing and transporting of the sample. It includes transferring the sample from the sampler (receiver) to a container and from the container to the laboratory apparatus in which it is to be analysed.

## 3.8 Sample types

**3.8.1 all-levels sample** : A sample obtained with an apparatus which is filled when passed through the total liquid height in one direction.

**3.8.2 bottom sample** : A spot sample taken from the material at the bottom surface (floor) of a tank or container (see figure 1).

**3.8.3 composite sample** : A sample obtained by combining a number of spot samples in defined proportions so as to obtain a sample representative of the bulk of the material. The usual

types of composite sample are obtained by combining samples in accordance with one of the following (see clause 4 and 7.3.1.1.2) :

- a) upper, middle and lower samples in equal proportions;
- b) upper, middle and suction-level samples in equal proportions;
- c) a series of spot samples from a non-homogeneous oil taken at more than three levels and blended in proportion to the quantities of oil represented;
- d) individual samples from several tanks or ship's compartments proportional to the total quantity each sample represents;
- e) a series of spot samples of equal volume obtained from a flowing pipeline taken at specified intervals.

**3.8.4 representative sample** : A sample having its physical or chemical characteristics identical to the volumetric average characteristics of the total volume being sampled.

**3.8.5 running sample** : A sample obtained by lowering a container from the top of the oil to the bottom and returning it to the top of the oil at a speed such that the container is about three-quarters full when withdrawn from the oil.

**3.8.6 spot sample** : A sample taken at a specific location in a tank or from a pipe at a specific time during a pumping operation.

**3.8.7 suction-level sample** : A sample taken at the lowest level from which liquid hydrocarbon is pumped from the tank. In determining this level, appropriate allowance is made for any fittings within the tank such as swing-arm, suction baffle or internal bend (see figure 1).

**3.8.8 upper sample** : A sample taken at a level of one-sixth of the depth of liquid below the top surface (see figure 1).

**3.8.9 middle sample** : A sample taken at a level of one-half of the depth of liquid below the top surface (see figure 1).

**3.8.10 lower sample** : A sample taken at a level of five-sixths of the depth of liquid below the top surface (see figure 1).

**3.8.11 top sample** : A spot sample obtained 150 mm below the top surface of the liquid (see figure 1).

**3.8.12 skim sample (surface sample)** : A sample taken from the surface of the liquid (see figure 1).

## 3.9 Statistical terms

**3.9.1 AQL (acceptable quality level)** : The maximum per cent defective (or the maximum number of defects per hundred units) that, for purposes of sampling inspection, can be considered satisfactory as a process average.