



**SLOVENSKI STANDARD**  
**oSIST prEN ISO 3170:2024**  
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**Ogljikovodikove tekočine - Ročno vzorčenje (ISO/DIS 3170:2024)**

Hydrocarbon Liquids - Manual Sampling (ISO/DIS 3170:2024)

Flüssige Mineralölerzeugnisse - Manuelle Probenahme (ISO/DIS 3170:2024)

Hydrocarbures liquides - Échantillonnage manuel (ISO/DIS 3170:2024)

**Ta slovenski standard je istoveten z: prEN ISO 3170**

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**ICS:**

75.080 Naftni proizvodi na splošno - Petroleum products in general

**oSIST prEN ISO 3170:2024**

**en,fr,de**





# DRAFT International Standard

## ISO/DIS 3170

### Hydrocarbon Liquids – Manual Sampling

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### 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 28, *Petroleum and related products, fuels and lubricants from natural or synthetic sources*, Subcommittee SC 2, *Measurement of petroleum and related products*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 19, *Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 3170:2004), which has been technically revised.

The main changes are as follows:

- Document title amended to reflect the expanded scope of the document for non-petroleum liquids
- inclusion of an equal representation of the closed and restricted sampling devices in addition to the traditional open sampling devices.
- Expanded on the definitions and bibliography sections
- Enhanced the safety section

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).



## ISO/DIS 3170:2023(en)

### Introduction

This document may be used in conjunction with ISO 3171.

This document specifies standard conditions and methods for obtaining samples of liquid/semi-liquid hydrocarbons from a tank, drum or pipeline by manual means. If the hydrocarbon to be sampled is non-homogeneous, showing significant variations in composition or containing sediments and water, samples taken manually should not be expected to be representative, but can enable the degree of non-homogeneity to be assessed and estimates of quality and quantity to be made.

The procedures specified in this document are intended to minimize or eliminate losses of light ends from samples. Such losses can occur during the handling or transfer of samples, thereby making them non-representative of the bulk.

The procedures specified provide samples for:

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

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

The sampling procedures for tank contents that are not homogeneous specified in this document are intended to enable the degree of non-homogeneity to be assessed and estimates of quality and quantity to be made.

Procedures for the sampling of liquid hydrocarbons from tanks under inert gas pressure are included, together with techniques for sampling from tanks which are equipped with vapour emission control systems.

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# Hydrocarbon Liquids – Manual Sampling

## 1 Scope

This document specifies the manual methods used for obtaining samples of liquid or semi-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.

It applies to the sampling of liquid products, including crude oils, intermediate products, synthetic hydrocarbons and bio fuels, which are stored at or near atmospheric pressure, or transferred by pipelines as liquids at elevated pressures and temperatures.

The sampling procedures specified are not intended for the sampling of special petroleum products which are the subject of other International Standards, such as electrical insulating oils (covered in IEC 60475), liquefied petroleum gases (covered in ISO 4257), liquefied natural gases (covered in ISO 8943) and gaseous natural gases (covered in ISO 10715).

This document refers to methods of sampling and sampling equipment in use at the time of writing. It does not exclude the use of new equipment, provided that such equipment enables samples to be obtained according to the requirements and procedures of this document.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 1998 (all parts), *Petroleum industry — Terminology*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 3171, *Petroleum liquids — Automatic pipeline sampling*

IP 476, *Petroleum liquids — Automatic pipeline sampling*

HM 93, *A guide to manual sampling of hydrocarbon liquids*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1998 (all parts) and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

### 3.1

#### acceptable quality limit (ACL)

maximum per cent that is defective (or the maximum number of defects per hundred units) that, for purposes of sampling inspection, can be considered satisfactory as a process average

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### 3.2

#### **all-level sample**

sample obtained with an apparatus which accumulates the sample at a uniform rate while passing in one direction only through the total liquid height, excluding any free water.

Note 1 to entry: Only bottom-up sampling is appropriate for aviation fuels. This is to ensure that the sample is satisfactorily taken. A bottom-up all-level sample shall have some ullage left in the sampling container to be valid. The disadvantage of bottom-up sampling is that the liquid column has been disturbed as the sampling apparatus is lowered.

### 3.3

#### **automatic sampler**

#### **automatic in-line sampler**

#### **automatic pipeline sampler**

device used to extract a representative sample from the liquid flowing in a pipe

Note 1 to entry: The automatic sampler generally consists of a probe, a sample extractor, an associated controller, a flow measuring device, and a sample receiver.

### 3.4

#### **batch**

identified quantity of product, the quality of which is covered by a single certificate of quality or certificate of analysis

### 3.5

#### **bottom sample**

spot sample collected from the material at the bottom of the tank, container, or line at its lowest point

Note 1 to entry: In practice, the term bottom sample has a variety of interpretations. It is therefore recommended that the exact sampling location (e.g. 150 mm from the bottom) should be specified when using this term.

### 3.6

#### **dead bottom sample**

sample taken of the liquid (fuel, water, mixture) in contact with the bottom surface of a tank or container

### 3.7

#### **water sample**

spot sample of free water taken from beneath the hydrocarbon in a tank

### 3.8

#### **closed sampling**

process of taking samples within a tank under closed conditions, which does not permit the release of any tank contents or vapour to the atmosphere

### 3.9

#### **composite sample**

sample obtained by combining a number of individual samples in defined proportions, with the aim of obtaining a sample representative of the bulk of the product

### 3.10

#### **sample integrity**

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

### 3.11

#### **skim sample**

spot sample taken from the surface of the liquid

### 3.12

#### **lower sample**

spot sample taken at a level of five-sixths of the depth of liquid below the top surface

**ISO/DIS 3170:2023(en)****3.13****middle sample**

spot sample taken at a level of one-half of the depth of liquid below the top surface

**3.14****metre interval sample**

spot sample taken at metre intervals throughout the depth of the liquid

**3.15****mixer**

device that provides a homogeneous mixture of the liquid within a pipeline or container in order to obtain a representative sample

**3.16****open sampling**

process of taking traditional samples from a tank via an open gauge hatch or gauging access point

Note 1 to entry: If the tank ullage space is pressurized, it will normally be necessary to use other (closed or restricted) procedures to avoid de-pressurizing the tank and the consequent loss of volatile organic compounds (VOCs).

**3.18**

portable sampling device (PSD)

housing designed to connect to a vapour lock valve, which contains a restricted or closed system sampler and is fitted with a tape or cable winding mechanism for lowering and retrieving the sampler

**3.19****representative sample**

portion extracted from the total volume that is deemed to have the constituents in the same proportions that are present in that total volume

**3.20****residue and deposit**

organic and inorganic matter, together with any water dispersed within it, which has separated from the liquid and either fallen to the bottom of the tank containing the liquid, or been left in the tank after the liquid has been pumped out

**3.21****restricted sampling**

process of taking samples within a tank using equipment which is designed to substantially reduce or minimize the vapour losses that would occur during *open sampling* (3.16), but where the equipment is not completely gas-tight

**3.22****running sample**

sample obtained with an apparatus which accumulates the sample at a uniform rate while passing in both directions through the total liquid height, excluding any free water

**3.23****sample conditioning**

mixing necessary to homogenize the sample during sample handling in preparation for subsampling or analysis

**3.24****sample handling**

conditioning, transferring, dividing, and transporting of the sample

Note 1 to entry: Sample handling includes transferring the sample from the primary sampling device to any secondary container, and the transferring of subsamples to the laboratory apparatus in which it is analyzed.

**3.25****sample size**

number of samples to be drawn from a batch to determine its acceptability as given in sampling plans

**ISO/DIS 3170:2023(en)****3.26****spot sample**

sample taken at a specific location in a tank or from a pipeline

**3.27****static mixer**

mixing device having no moving parts and located within a pipe or tube

Note 1 to entry: The effectiveness of the static mixer depends on the kinetic energy of the moving liquid for the energy required to mix the liquid.

**3.28****still well****stand pipe**

still pipe

sounding pipe

vertical cylindrical pipe built into a tank to permit gauging operations while reducing errors arising from turbulence or agitation of the liquid

Note 1 to entry: Samples taken from unperforated or unslotted still wells should not be used for custody transfer applications.

Note 2 to entry: Still wells can be found in static tanks and in ship and barge tanks.

**3.29****suction level sample****outlet sample**

sample taken at the lowest level from which liquid hydrocarbon is pumped from the tank.

Note 1 to entry: On determining this level, appropriate allowance is made for any fittings within the tank such as swing-arms, suction baffles or internal bends.

**3.30****sump sample**

spot sample taken from within a sump

**3.31****suspended water**

water contained within the liquid hydrocarbon that is finely dispersed as small droplets

Note 1 to entry: Over a period of time, this water can either collect as free water or, become dissolved water, depending on the conditions of temperature and pressure prevailing.

**3.32****tap sample**

spot sample taken via a tap, typically located on the side of a shore tank

**3.34****top sample**

spot sample obtained 150 mm below the surface of the liquid

**3.35****total water**

sum of all the dissolved, suspended, and free water in a cargo or parcel of liquid hydrocarbon

**3.36****ullage**

empty capacity left in a fixed volume sample receiver or container above the liquid surface

**3.37****upper sample**

spot sample taken at a level of one-sixth of the depth of the liquid below the top surface