
**Paints, varnishes and raw materials
for paints and varnishes — Sampling**

*Peintures, vernis et matières premières pour peintures et vernis —
Échantillonnage*

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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 documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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The committee responsible for this document is ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

This second edition cancels and replaces the first edition (ISO 15528:2000), which has been technically revised. The main changes are:

- a) the detailed information on how to achieve homogeneity of the product to be sampled was removed;
- b) the sampling procedure for large containers and small containers was merged;
- c) the information on the minimum number of containers to be sampled was removed;
- d) definitions for middle sample and all-layer sample were added.

Introduction

Sampling depends on the product and the size of the container but not on the type of product, e.g. paint, varnish, binder, pigment, extender or solvent. ISO 1513, [1] specifies both the procedure for preliminary examination of a single sample as received for testing, and the procedure for preparing a test sample by blending and reduction of a series of samples representative of a consignment of paint, varnish or related product. The samples of the product to be tested have been taken in accordance with this document.

Correct sampling forms the basis for the subsequent tests and their results. The various sampling procedures need to be carried out with great care by operators having the required knowledge and experience. The general instructions in this International Standard are intended to supplement this knowledge and experience and are applicable to most situations. However, some products might require special sampling precautions that are not given in this International Standard; therefore, special vigilance will be necessary on the part of operators to take note of any unusual characteristics exhibited by those products. It is also essential that operators adhere to any special precautions in accordance with product specifications and national safety regulations.

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Paints, varnishes and raw materials for paints and varnishes — Sampling

1 Scope

This International Standard specifies procedures for the sampling of paints, varnishes and raw materials used in their manufacture. Such products include liquids and materials which, without undergoing chemical modification, are capable of being liquefied when heated up, and powdered, granulated and pasty materials. Samples may be taken from containers, e.g. cans, drums, tanks, tank wagons or ships' tanks, as well as from barrels, sacks, big-bags, silos or silo wagons, or from conveyor belts.

This International Standard does not deal with the sample preparation for testing or reduction of the samples thus taken. This is dealt with in ISO 1513.^[1]

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.

ISO 4618, *Paints and varnishes — Terms and definitions*

ISO 6206, *Chemical products for industrial use — Sampling — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618, ISO 6206 and the following apply.

3.1

batch

definite quantity of a material which was produced under uniform conditions

3.2

lot

total quantity of material which is to be sampled

Note 1 to entry: The lot may consist of a number of batches.

3.3

individual sample

that part of a product taken from a bulk material by one sampling operation

3.4

representative sample

sample which complies, within the precision of the test methods used, in all of its characteristic features with the material sampled

3.5

average sample

mixture of equivalent portions of individual samples

3.6

top sample

individual sample taken at or near the surface of a material

3.7

middle sample

individual sample taken at a level corresponding to approximately half of the total volume below the surface

3.8

bottom sample

individual sample taken at or near the lowest level of a material

3.9

all-layer sample

individual sample taken through the total height of the material, so that all layers are collected proportionately

3.10

composite sample

individual sample taken from a number of different levels of a material

3.11

intermittent sample

individual sample taken intermittently from a flow of material

3.12

continuous sample

sample taken continuously from a flow of material

3.13

storage sample

individual, average or continuous sample which is taken and stored for a specified period for reference purposes

4 General requirements

Sampling, the labelling and storage of samples, and the preparation of the associated documentation shall be carried out by skilled personnel. After selection of a clean sampling device of a suitable type and size, sampling shall be performed observing the relevant regulations on environment, health and safety.

The sampling method used shall take into account both the physical and the chemical characteristics of the material concerned, e.g. its sensitivity to light and oxidation, its tendency to undergo surface reactions (skin formation) and its hygroscopic, physiological and toxicological characteristics.

Storage of the samples, including the storage samples, shall comply with relevant regulations on environment, health and safety, and the quality management requirements concerning labelling, traceability and periods of storage.

5 Sampling equipment

5.1 Sampling devices

5.1.1 General

The choice of sampling device depends on the type of material being sampled, the type of container, the level to which the container is filled, and the sample size required. General requirements for sampling devices include

- easy handling,
- easy cleaning (smooth surfaces),
- chemical resistance to the material being sampled.

5.1.2 Scoops

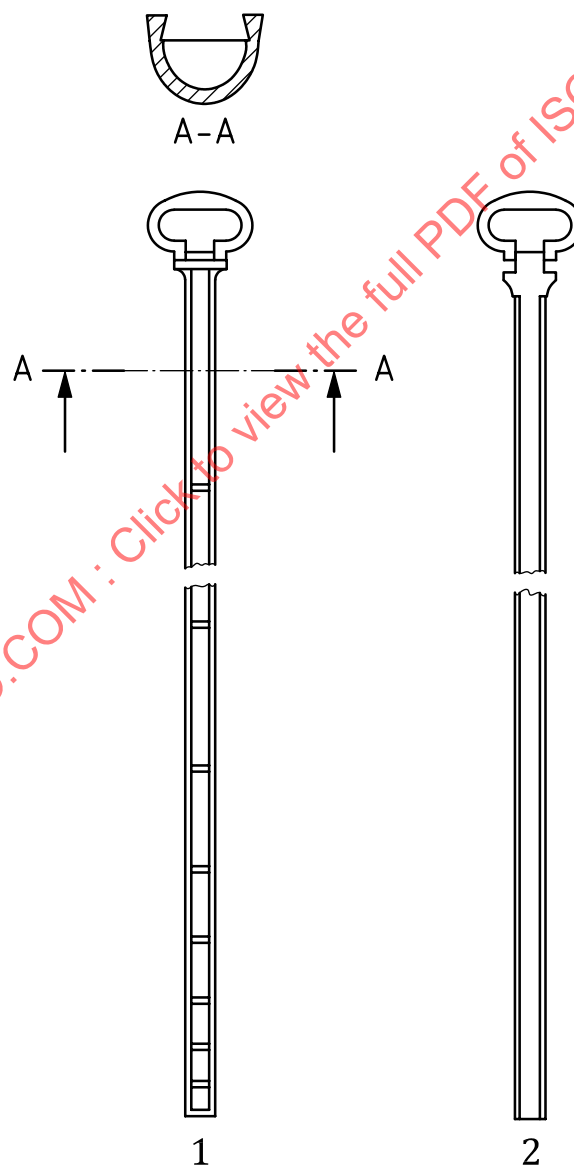
5.1.2.1 Scoop (ladle) (see also 5.1.7)

A scoop shall consist of a material which is not altered by the product to be tested. It is primarily used for taking top samples of solid materials.

5.1.2.2 Scoop for liquids

This instrument consists of a D-shaped metal trough divided into compartments along its length, and a shutter that moves vertically along the entire length to open and close compartments (see Figure 1). It is normally from 25 mm to 50 mm in diameter.

The instrument is inserted closed and the shutter pulled out to admit the liquid; the scoop is then closed and withdrawn.



Key

- 1 trough
- 2 shutter

Figure 1 — Sample scoop for liquids

5.1.2.3 Scoops for powders

Such scoops are open instruments intended for use with solids in powder form. They are of metal, of semicircular or C-shaped cross-section and when inserted bore out a core through the material (see [Figure 2](#)).

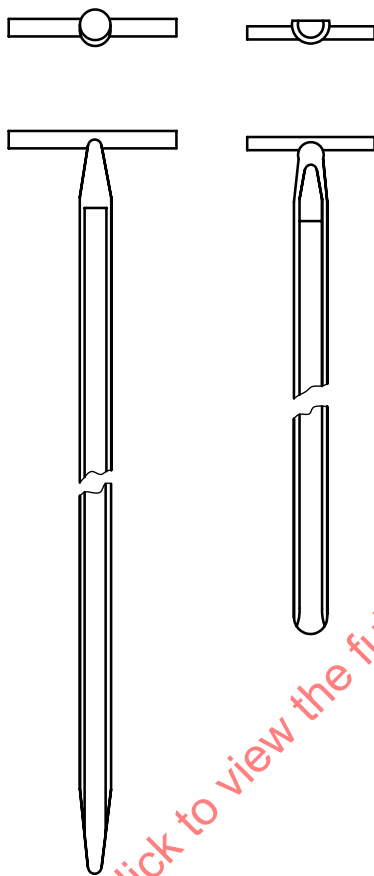


Figure 2 — Sampling scoops for powders

5.1.3 Sampling tubes for liquids

5.1.3.1 Concentric tubes

These consist of two concentric metal tubes which fit closely one inside the other along their entire length, so that one tube can be rotated within the other. A longitudinal opening or series of openings of about one-third of the circumference is cut in both tubes. In one position the tube is open and admits the liquid; by turning the inner tube it becomes a sealed container (see [Figure 3](#)).

The inner tube is normally 30 mm to 40 mm in diameter. It may be undivided along its length, in which case the two tubes are provided with V-shaped ports at their lower ends, placed so that liquid contained in the instrument can be drained through them when the longitudinal opening is open.

Alternatively, the inner tube may be divided transversely into a number of compartments, normally from three to 10, in which case the bottom V-shaped ports are omitted. Such an arrangement enables separate samples of liquid to be withdrawn from different depths in the container.

The tube should be of sufficient length to reach the bottom of the container. It is inserted closed, then opened to admit the liquid and finally closed and withdrawn.

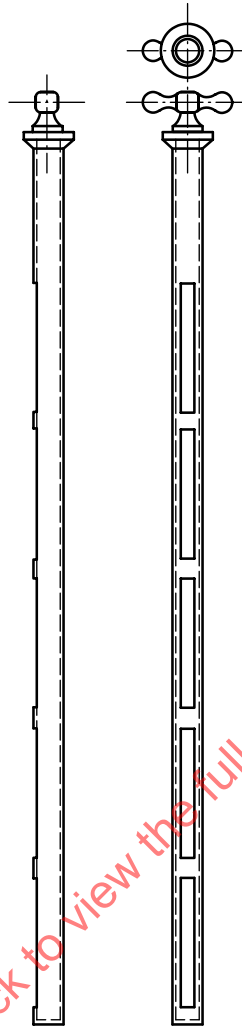


Figure 3 — Sampling tube consisting of two concentric tubes

5.1.3.2 Single tube

A single-tube sampler, an example of which is shown in [Figure 4](#), may be used where the liquid to be sampled is known to be homogeneous in character. It consists of a metal or thick-walled glass tube which may vary from 20 mm to 40 mm in diameter and from 400 mm to 800 mm in length. The upper and lower ends are conical and narrow down to about 5 mm to 10 mm. At the upper end there are two rings to assist in handling.

To take an individual sample, the tube is first closed at the top with a stopper, and lowered until the desired depth is reached. It is opened for a short time to admit the liquid and then closed and withdrawn.

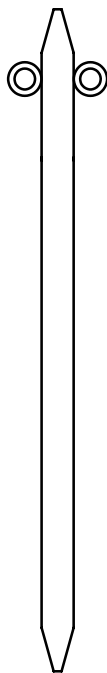
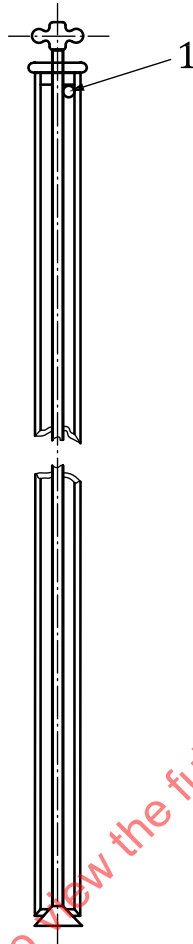


Figure 4 — Example for a sampling tube with single tube

5.1.3.3 Valve sampling tube

A valve sampling tube, an example of which is shown in [Figure 5](#), consists of a metal tube with a valve at the base connected by a central rod to a screw handle at the top. When the handle is screwed down the valve is closed. It differs from the tubes described previously in that it is introduced into the liquid with the valve open, allowing the liquid to enter as the tube dips below the surface while the displaced air passes through an air-vent at the top of the tube. When the base of the tube touches the bottom of the container, the valve automatically closes. The handle is then screwed tight so as to keep the valve shut and the tube containing the sample is withdrawn. The outside of the tube is wiped clean. Sampling tubes of various lengths are used. The valve sampling tube, illustrated in [Figure 5](#), is not suitable for use where sediments have accumulated.

**Key**

1 air vent

Figure 5 — Example for a valve sampling tube**5.1.4 Sampling bottle or can**

The sampling bottle or can is also called a dipping bottle or can (see [Figure 6](#)). It consists of a sufficiently heavy supporting frame made of spark-proof metal which is attached to a chain made of stainless steel or any other suitable material, and on which is mounted a bottle made of glass or any other suitable material. A dipping can may be, for example:

- an open bottle;
- a bottle with a stopper fitted with two glass tubes of different lengths (by adjusting the inner diameters of the tubes, a sample can be obtained which corresponds to the depth in the container and the viscosity of the sample material);
- a bottle with a stopper which can be removed at the desired depth by means of a second chain.

The dipping can is particularly suitable for taking samples from large containers (storage tanks, ships' tanks, etc.).

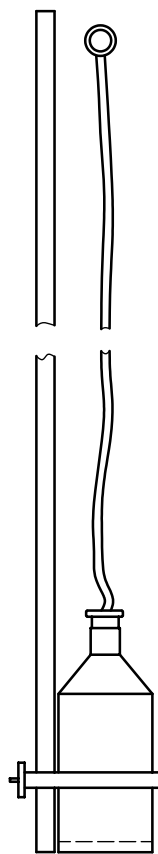


Figure 6 — Sampling can

5.1.5 Bottom or zone sampler

A bottom or zone sampler (see [Figure 7](#)) consists of a cylindrical vessel having a spindle valve made of spark-proof metal. It is attached to a dipping chain made of stainless steel or any other suitable material. An additional chain may be attached to the upper end of the valve spindle to allow the valve to be opened at a particular depth. The valve opens automatically when it touches the bottom of the container, so that the zone sampler is particularly suitable for taking bottom samples from large containers.

The bottom sampler and dipping chain should have a scale indicating the depth where the sample is taken.

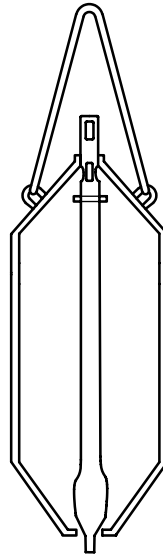


Figure 7 — Bottom or zone sampler (sectional view)

5.1.6 Spatula

A spatula may be of any convenient shape or size. The blade is made of a suitable material such as stainless steel or plastic. The spatula is particularly useful for taking individual samples of pasty materials.

5.1.7 Shovel (see also [5.1.2.1](#))

A sampling shovel is made of a suitable material, such as stainless steel or plastic, and has raised sides and a short handle. It is primarily used for taking samples from solid materials in granular or powder form.

5.1.8 Branch pipe

A branch pipe is suitable for taking individual or continuous samples, e.g. from storage tanks, tank vehicles or pipelines, and is provided with a shut-off valve.

5.2 Sample containers

Sample containers (e.g. screw-cap jars, coated or uncoated tins or plastic bags) for small samples and storage samples shall be selected depending on the product to be sampled so that the sample is protected against the action of light and no material can escape from or enter the container.

Glass containers shall be fitted with tight closures that are not affected by the sample.

NOTE Dark glass provides partial protection against the action of light and the contents can be further shielded, if necessary, by an external opaque covering or packaging.

Galvanized and aluminium containers shall not be used for sampling alcoholic materials.

6 Sampling procedure

6.1 General

The minimum size of a sample shall be sufficient for the subsequent tests and the storage sample.

6.2 Pre-sampling inspection

Before sampling is carried out, the material, the container and the sampling point shall be inspected for abnormalities. If any abnormalities are observed, they shall be recorded in the sampling report.

6.3 Taking samples from containers

6.3.1 Number of samples and homogeneity

The number of samples to be taken from large containers (e.g. tanks, silos) and small containers (e.g. drums, bags) depends on the sampling plan (e.g. ISO 2859 [2]) or supply agreements.

To make the correct choice of the number of samples to be taken, as much information as possible should be available. This might comprise environmental and storage conditions for the product. The varying conditions might result in inhomogeneity of the product within a container as well as variations between different containers.

The product shall be homogeneous before taking the sample.

6.3.2 Liquids

A top sample may be taken from a liquid or liquefied product by means of a scoop (5.1.2). For sampling at other levels, the dipping can (5.1.4) is the most suitable means, and the zone sampler (5.1.5) is particularly suitable for taking a bottom sample.

Scoops (5.1.2) may be used for taking all-layer samples, middle samples or bottom samples.

Other possible sampling procedures include the taking of an individual sample from a bleed point, taking care to allow sufficient liquid to run off first, or in the case of pumped liquids by means of a branch pipe (5.1.8) during circulating, discharging or loading. In the case of pumping operations, a continuous sample may be taken from a bypass line by using a suitable branch pipe.

6.3.3 Products in paste form

A top sample may be taken from pastes by using a spatula (5.1.6).

6.3.4 Solids

In the case of solids in powdered form, as granules or rough grains, it is generally only possible to take a top sample by means of a scoop (5.1.2), spatula (5.1.6) or shovel (5.1.7).

Intermittent samples may be taken when containers are being filled or emptied, using a conveyor belt or a worm conveyor, for instance.

A sampling tube for liquids (5.1.3) may also be used in certain cases.

6.4 Reduction in sample size

Thoroughly mix the whole sample, taken in accordance with the appropriate procedure.

Mix liquids in a clean, dry container. Then immediately take at least three uniform samples (final samples) of a quantity needed to carry out the required tests, and place in containers complying with 5.2.

For solids, quarter the gross sample by means of a rotary sample divider (riffle divider). Take three samples of a quantity needed to carry out the required tests, and place in containers complying with 5.2.

6.5 Labelling

After a sample has been taken, it shall be labelled in such a way that it can be traced.