International Standard 842

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Raw materials for paints and varnishes — Sampling

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Foreword

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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.

International Standard ISO 842 was developed by Technical Committee ISO/TC 35, *Paints and varnishes*, and was circulated to the member bodies in February 1983.

It has been approved by the member bodies of the following countries :

Australia	Israel	South Africa, Rep. of
Belgium	Jamaica	Sri Lanka
Canada	Korea, Rep. of	Sweden
France	Netherlands	Switzerland
Germany, F. R.	Nigeria	Thailand
Hungary	Norway	United Kingdom
India	Poland	USSR
Iran	Portugal	
Iraq	Romania	

The member body of the following country expressed disapproval of the document on technical grounds :

Italy

This second edition cancels and replaces the first edition (i.e. ISO 842-1974).

Printed in Switzerland

INTERNATIONAL STANDARD ISO 842-1984 (E)

Raw materials for paints and varnishes — Sampling

0 Introduction

Correct sampling is a difficult process and one that requires most careful attention. It is therefore essential that it should be carried out under the supervision of an experienced sampler.

The procedures given below are recognized as good practice and it is strongly recommended that they be followed whenever practicable. It is recognized that it is difficult to lay down fixed rules to be followed in every case and particular circumstances may render some modification of the methods desirable. It should always be the aim to obtain a sample that is properly representative of the bulk of the material.

In some cases the act of taking a sample exposes the sampler to personal risk or may cause the creation of hazardous conditions endangering the safety or others. ISO 3165 gives general guidance on safety in the sampling of chemical products for industrial use and is intended to assist those engaged in sampling or in directing the activities of samplers.

The main differences with the first edition are that a clause "Safety precautions" has been introduced, the definitions have been aligned with ISO 6206 and the labelling requirements have been made more explicit.

1 Scope and field of application

This International Standard describes methods for the sampling of raw materials for paints and varnishes and describes and illustrates apparatus that can be used for this purpose. Suitable methods are included for sampling oils and other non-volatile liquids, and dry powders such as pigments and extenders. Suitable methods are also given for labelling and transport of the samples.

For sampling solvents (clause 9) refer to ISO 1995, ISO 3170 and ISO 3171; for sampling solids (clause 10) refer to ISO 56/1.

2 References

ISO 56/1, *Shellac — Specification — Part 1 : Hand-made shellac.*

ISO 1995, *Aromatic hydrocarbons — Sampling.*

ISO 3165, *Sampling of chemical products for industrial use — Safety in sampling.*

ISO 3170, *Petroleum products — Liquid hydrocarbons — Manual sampling.*

ISO 3171, *Petroleum products — Liquid hydrocarbons — Automatic pipeline sampling.*

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

3 Definitions

For the purpose of this International Standard, the following definitions apply :

3.1 batch; lot : A definite quantity of a material produced under conditions which are presumed uniform.

3.2 consignment : A quantity of material covered by a particular consignment note or shipping document.

3.3 sample : A definite quantity of material taken from a batch or consignment and intended to provide information necessary for assessing a characteristic of that batch or consignment.

3.4 bulk sample; gross sample : The total material obtained by the sampling procedure.

3.5 reduced sample : A sample obtained by applying a method of reduction to the gross sample.

3.6 top sample : A sample taken at approximately one-tenth of the depth below the top surface of the material in a container.

3.7 middle sample : A sample taken at approximately one-half of the depth of the material in a container.

3.8 bottom sample : A sample taken at approximately one-tenth of the depth above the lowest part of a container.

4 Safety precautions

4.1 A number of hazards may arise in the sampling of materials, for example solvents, acrylic monomers and certain

pigments. They include flammability and toxicity by inhalation and/or absorption by the skin. Most manufacturers advise prospective users and others in the handling of their products.

Further information on individual substances is given in the following publications :

Conseil de l'Europe (Sous-comité de la santé et sécurité industrielle) — (Section chimie), *Substances chimiques dangereuses et proposition concernant leur étiquetage*, Strasbourg, 3ème éd., 1971.

SAX, N. IRVING, *Dangerous properties of industrial materials*, Van Nostrand Reinhold.

BROWNING, ETHEL, *Toxicity and metabolism of industrial solvents*, Elsevier, Amsterdam.

MUIR, G. D. (Ed.), *Hazards in the chemical laboratory*, Royal Institute of Chemistry, London.

GASTON, P. J., *The care, handling and disposal of dangerous chemicals*, Institute of Science Technology.

Further information may also be obtained from the Manufacturing Chemists Association Inc. of Washington, D. C., USA, which publishes Chemical Safety Data Sheets relating to specific chemicals.

Reference should be made to relevant national legislation concerning hazards and safety precautions for the product being sampled.

4.2 It is strongly recommended that two persons should be present when samples are drawn from large containers such as storage tanks, road tanks or rail tanks.

4.3 Before sampling from rail tanks, ascertain that no shunting operations are to be carried out.

Ensure that the vehicles are securely parked and that the brakes are fully applied.

4.4 In order, on the one hand, to allow for the high coefficient of expansion of certain products and for the need ultimately to mix the samples thoroughly to obtain representative test samples and, on the other hand, to avoid too large an air space which can adversely affect most oils, the sample containers shall be filled to between about 80 and 90 % of their total capacity.

WARNING — During sampling of a product avoid, as far as possible, contact between the product and the skin, clothing, etc. The correct treatment for any harmful materials shall be known beforehand and the appropriate materials for treatment and the antidote shall be readily at hand.

4.5 Make sure that the tank and the sampling container are adequately earthed.

5 Cleanliness safeguards

Special care is necessary to ensure that all sampling apparatus is clean and dry when used. Sampling instruments may first be cleaned with an appropriate (mineral) solvent and subsequently with a hot solution of soap or other detergent, care being taken to wash away the last traces with scalding hot water. If a source of steam is available, the instruments may receive a final cleaning in a jet of steam. Finally, the operator shall ensure that the apparatus is thoroughly dry.

Thoroughout the sampling operation the operator shall take care to avoid contamination of the sample, such as transfer of dirt during handling.

Sampling shall be carried out in such a manner as to protect the samples, the material being sampled, the sampling instruments and the containers in which the samples are placed, from adventitious contamination by rain, dust, etc.

Material adhering to the outside of the sampling instrument shall be removed before the contents are discharged. The sampling instruments shall be emptied and cleaned immediately after sampling.

6 Containers for samples

For liquid samples, the containers used shall be either bottles of colourless or amber glass, or metal cans. For pastes, mixtures of liquids and solids, or solids, wide-mouth metal cans or glass jars shall be used. The container and its stopper shall be of a material that will not contaminate the sample.

Bottles and jars of colourless glass have the advantages that their cleanliness can be visually checked and also that they enable a check to be made easily on whether the sample contains free water or other impurities. Bottles and jars of amber glass provide only a partial protection against the action of light; for materials particularly sensitive to the action of light, complete protection shall be obtained by putting the bottle or jar in a cardboard box or by covering it with black paper or aluminium foil.

Galvanized or aluminium cans or stoppers shall not be used for the sampling of alcoholic materials. Glass bottles and jars shall be closed either by cork or glass stoppers or by screw-caps. In the case of metal cans intended for liquids, only screw-caps shall be used. For other metal cans, either a screw-cap or a suitable lid providing a tight closure shall be used. Rubber stoppers shall not be used. Cork stoppers shall be of good quality, clean and devoid of cracks or pieces of cork that are liable to become detached. Contact between cork and sample shall be prevented by covering the stopper with tin or aluminium or PTFE foil before inserting it in the bottle or jar, unless otherwise directed. Aluminium foil shall not be used with alcoholic materials. If bottles or jars with ground glass stoppers are used, their freedom from leakage shall be checked. Screw-caps are more satisfactory if protected by a cork disc covered with tin or aluminium or PTFE foil or any other material which cannot contaminate the sample. Aluminium foil shall not be used with alcoholic materials.

7 Sampling instruments

7.1 Types and construction

To ensure that the sampling instruments will not be attacked by the products, and that they can be easily cleaned, they shall be made of stainless steel, brass or glass. Copper-bearing metals shall not be used when sampling vegetable oils. To enable sampling instruments to be easily cleaned, they shall have smooth surfaces, without folds or grooves. Examples of suitable instruments are described below; those for sampling liquids are illustrated in figures 1 to 10, and those for sampling solids in figure 11.

7.2 Instruments for sampling oils and volatile liquids

The instruments described in 7.2.1 to 7.2.5 are made in various sizes to hold from 150 ml to 1 litre of liquid.

The instruments described in 7.2.6 to 7.2.9 are made in a wider range of sizes.

7.2.1 Sampling bottle or can (figure 1)

This instrument consists of a weighted bottle or metal container, with removable stopper or cap to which is attached a suitable chain, pole or cord. This device is lowered to the various desired depths where the stopper is removed and the container allowed to fill.

This instrument is suitable for sampling vessels and tanks.

7.2.2 Sampling tipping dipper (figure 2)

This instrument consists of a cylinder 150 mm long and 50 mm in diameter carrying at its closed end a plate with a hole, and at its open end a stout wire handle; the handle carries a small metallic catch and a rope; the cylinder is inverted in the position shown in figure 2a), and maintained in that position by insertion of the catch into the hole. It is then immersed in the liquid in the tank and at the required depth the rope is twitched. The cylinder rights itself and then fills with the liquid [figure 2b)].

7.2.3 Sampling cylinder (figure 3)

This instrument consists of an open-headed cylinder with a bottom valve which remains open whilst the instrument is being lowered through the liquid, ensuring that an even flow of liquid passes through the cylinder.

When lowering ceases, the valve closes and a sample of the liquid is drawn from the depth reached by the instrument.

7.2.4 "Go devil" sampling bottle (figure 4)

This instrument consists of a bottle, heavily weighted at the bottom, 300 mm long, 75 mm in body diameter, and 25 mm in neck diameter, with a chain attached to a holder, fastened to the middle of the bottle. When placed in a liquid in a tank, it drops so quickly that it does not begin to fill with liquid until it reaches a fixed position.

7.2.5 Bottom, or zone sampler (figure 5)

This instrument is suitable for withdrawing bottom samples or zone samples at any level from tanks of liquid. To withdraw a bottom sample, the apparatus is attached to a cord or chain and lowered empty to the bottom of the tank where the central spindle valve automatically opens and the container fills from the bottom. On withdrawal the valve automatically closes again.

To withdraw a sample at any level, the apparatus is lowered empty to the required level and then by means of an additional cord, previously attached to the top of the central valve spindle, the valve is opened and the container filled. The valve is then allowed to close and the container withdrawn.

7.2.6 Sampling tubes (figures 6 and 7)

The sampling tube shown in figure 6 consists of two concentric metal tubes closely fitted into each other throughout 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.

The inner tube is 20 to 40 mm in diameter. It may be undivided in its length, in which case the two tubes are provided with V-shaped ports at their lower ends, so placed that liquid contained in the instrument can be drained through them when the longitudinal openings are open.

Alternatively, the inner tube may be divided transversely into from three to ten compartments, in which case the bottom 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 barrel or container. It is inserted closed, then opened to admit the liquid and finally closed and withdrawn.

The sampling tube shown in figure 7 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 to 40 mm in diameter and from 400 to 800 mm in length. The upper and lower ends are conical and narrow down to about 5 to 10 mm. At the upper end there are two rings to assist handling.

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

7.2.7 Valve sampling tube (figure 8)

This instrument consists of a metal tube with a valve at the base connected by a central rod to a screwed handle at the top. When the handle is screwed down the valve is kept closed. It differs from the tubes previously described 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-hole 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 unless the cleaning device (described in 7.2.9) is used. Sampling tubes of various lengths are used, one 2 m long, made of aluminium, being convenient for sampling road tanks.

This instrument is not suitable for use where sediments have accumulated.

7.2.8 Sampling scoop for liquids (figure 9)

This instrument consists of a D-shaped metal trough divided into compartments along its length, and a shutter which moves vertically along the entire length to open and close compartments. It may be from 25 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.

7.2.9 Sampling tube withdrawal cleaner (figure 10)

This instrument is a funnel-shaped metal cup designed to sit in the bung-hole of a barrel or drum. It contains a fibre washer with a central opening of the same diameter as the sampling tube with which it is to be used. Before taking a sample, the tapered end of the cleaner is placed in the hole of the drum and the sampling tube inserted through the cleaner into the drum. On withdrawing the tube, the excess liquid on the outside is automatically wiped off, and runs back into the drum.

7.3 Instruments for sampling dry powders (figure 11)

The sampling scoops are open instruments and are intended for use with solids. They are of metal, of semicircular or C-shaped cross-section and bore out a core through the material.

8 Collection of gross sample of oils and other non-volatile liquids

8.1 Liquids in large quantities in shore tanks or ships' tanks

Sample each tank separately. Measure the volume or depth of liquid before sampling and, if necessary, record the temperature.

When stearin or any other solid matter has been deposited, or where the material is semi-solid, it is desirable that it should be heated sufficiently to allow good mixing before sampling.

If the liquid is not homogeneous in character, for example if it contains free water or froth, take samples at levels not more than 300 mm apart throughout the depth of the liquid. It is recommended that the first sample be taken from the lowest point in the tank and thereafter at each 300 mm level above that point.

If the liquid is known to be homogeneous in character, three samples taken at levels one-tenth of the depth of the liquid from the surface, but at not more than 150 mm from the surface (top sample), one-half of the depth (middle sample) and at a point nine-tenths of the depth of the liquid from the surface, but at not more than 300 mm above the lowest part of the container (bottom sample) may be sufficient.

In each instance, take the sample by a sampling instrument which is filled at the required depth. Mix the samples drawn from different levels together in the same proportion they represent in the total quantity of liquid being sampled.

If free water is present, remove this, where possible, and measure it before samples and masses or volumes are taken. If foots[1] are present, take a bottom sample at the lowest point of the tank (bottom sample).

8.2 Liquids being transferred from one tank to another

8.2.1 General

The most efficient method of sampling very large quantities is during the transfer, by means of frequent dipping in the stream at regular intervals during outflow of the whole contents of the tank; this method is particularly easy to apply when the liquid is pumped through a weigh-meter tank.

Alternatively, the sampling may be carried out by means of a side or secondary stream tapped from the main stream; certain conditions, however, have to be carefully observed to ensure accurate sampling by this method which is most suited to relatively homogeneous consignments of liquid. The difficulties arising from the presence of free water and foots are obvious.

8.2.2 Tap or drip cock

Feed the tap or drip cock from a nozzle introduced into the centre of the pipeline and facing the flow of liquid. Taps let into the side or bottom of the pipeline are not acceptable.

Introduce the tap or drip cock if possible into a rising section of the main pipeline and on the pressure side of the pump.

Ensure the tap or drip cock is of such design as to be easily and quickly cleared in case of blockage.

8.2.3 Operation

Ensure that the rate of flow in the main pipeline is sufficient to provide the turbulence necessary to effect complete mixing of the materials in the pipe.

1) For definition of "foots" see ISO 150, *Raw, refined and boiled linseed oil for paints and varnishes — Specifications and methods of test.*

As irregularity in the rate of flow can lead to inaccuracy, regulate the rate of flow at the tap or drip cock throughout the sampling proportionately to the amount of liquid passing through the pipeline.

To prevent adventitious contamination of the sample, place adequate cover over the sampling apparatus and the containers for collecting samples.

Mix the total sample from the drip cock carefully immediately after the completion of the discharge and then take smaller samples for any necessary tests.

Take precautions against the possibility of choking of the drip cock, etc. by pieces of dirt.

If free water is present, remove it, where possible, before samples are taken and masses or volumes are measured.

8.3 Liquids in road and rail tanks

No entirely satisfactory method of sampling road and rail tanks has been devised. Current methods include withdrawing a sample during or immediately after filling, and, where sampling is carried out at other times, withdrawing a top sample and a middle sample through the manhole and a bottom sample from the discharge cock after running off and measuring any free water. The samples shall be kept separately and shall be adequately marked.

8.4 Liquids in small tanks, barrels, casks and other small containers

If the batches within a consignment are stated to be identical (or equivalent), it may be appropriate to sample from the containers within the consignment. In that case, take the number of samples according to the table.

Table — Minimum number of containers to be sampled

Total number of containers in the lot	Minimum number of containers to be sampled
1 to 2	all
3 to 8	2
9 to 25	3
26 to 100	5
101 to 500	8
501 to 1 000	13

Select the containers from which samples are drawn at random throughout the consignment. Ensure that they have not been opened previously.

Prior to sampling, roll and tip barrels and casks, and thoroughly stir the contents of tubs, vats or small tanks until the contents are homogeneous. Take care not to contaminate the liquid during this operation.

Draw a sample from each container to be sampled with a suitable sampling instrument (see 7.2) which is inserted through the bung-hole in a barrel or through convenient openings in other containers in such a manner as to sample from as many parts of the contents as possible. Mix equal portions of these samples thoroughly to form the gross sample.

If a consignment consists of several identifiable batches or lots, or if different parts of the consignment are of different quality, sample these separately.

If a single final sample representing the whole consignment is required, mix together the samples drawn from the different batches or lots, or from the different qualities, in the same proportion they represent in the total consignment.

9 Collection of gross sample of volatile liquids

When sampling volatile liquids, use the procedures given in ISO 1995, ISO 3170 or ISO 3171 as appropriate and with suitable modification.

10 Collection of gross sample of solid resins

When sampling solid resins, use the procedure described in ISO 56/1 with suitable modification.

11 Collection of gross sample of dry powders

Prepare a gross sample for each batch. When a consignment consists of more than one type of container, classify the containers according to type and treat them as separate batches. If a consignment consists of several identifiable batches, it is desirable that these be sampled separately.

The number of samples shall be taken according to the table.

Select the containers from which the samples are drawn at random throughout the batch. Ensure that they have not been opened previously. Withdraw a portion near the centre of the container by means of a suitable sampling instrument. The gross sample thus obtained shall contain equal portions from each container sampled and shall be not less than 2 kg or three to four times the quantity needed to carry out the required tests.

12 Reduction of sample size

Mix thoroughly the gross sample taken according to the appropriate procedure specified in clauses 8 to 11.

Mix liquids in a clean, dry container, preferably of stainless steel. Take at least three uniform samples (final samples), each of at least 400 ml, or three to four times the quantity needed to carry out the required tests, as soon as possible and place them in containers complying with clause 6.

For solids, quarter the gross sample down by means of a rotary sample divider (riffle divider). Take three samples of 500 g, or three to four times the quantity needed to carry out the required tests and pack them in containers complying with clause 6.

13 Labelling and transport of samples

Protect samples from light, moisture and dust, and excessive heat or cold. Protection against moisture and dust may be obtained by covering the stopper and top of the container with a cap of paper, plastics material or metal.

Label the containers as soon as the samples are taken. The labels shall bear all the necessary information to enable the samples to be identified without dispute. The label and marking ink used shall be capable of withstanding moisture and relevant solvents. Do not attach the label to the stopper, but to the neck or body of the container.

It is recommended that the following particulars should be given on the label :

a) a description of the material;

b) the size and particulars of the consignment (tank-wagon, tank, ship, barrel, drum);

c) the designation and reference number of the sample;

d) the consignor;

e) the place of sampling;

f) the date of sampling;

g) the name of the sampler.

After closure and labelling, the sample container shall be sealed in such a way that the contents and the label cannot be removed without breaking the seal. Precautions shall be taken to avoid contamination of the sample.

Samples shall be accompanied by a delivery note repeating the details given on the label and, if necessary, by a report giving all the details of sampling.

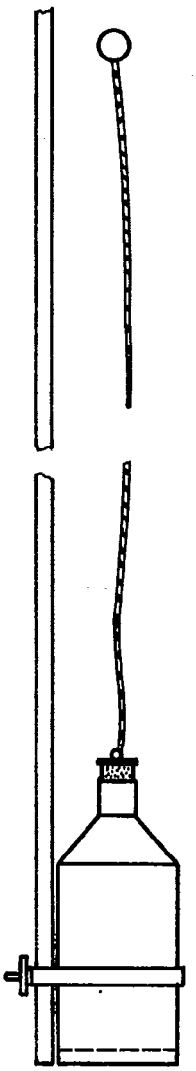
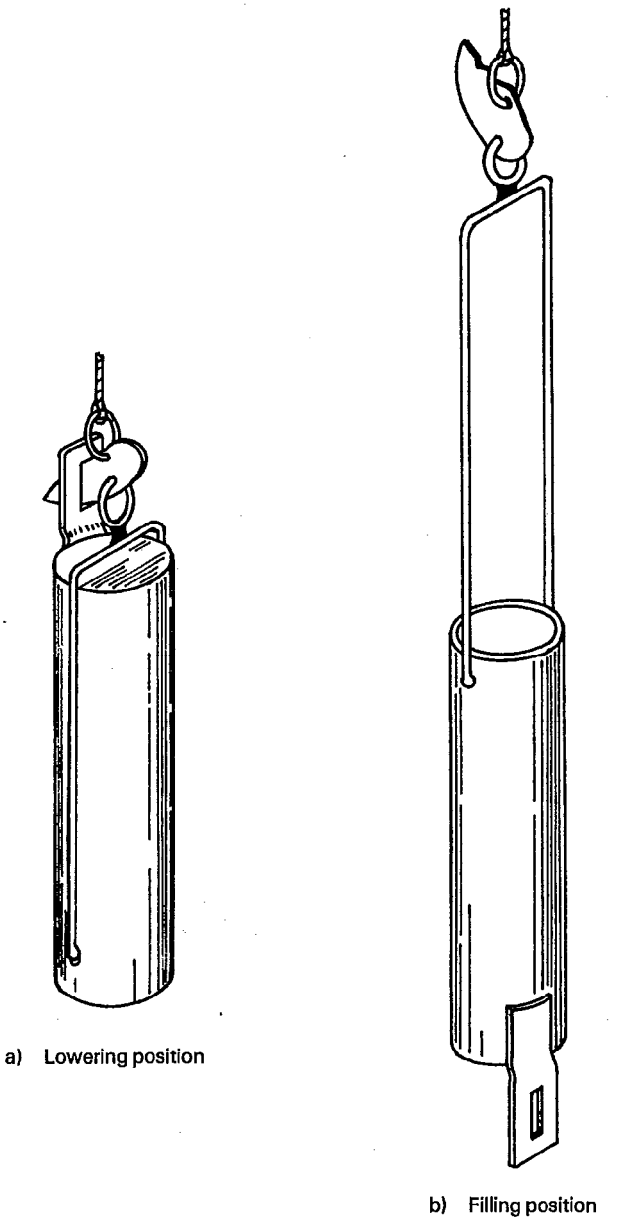


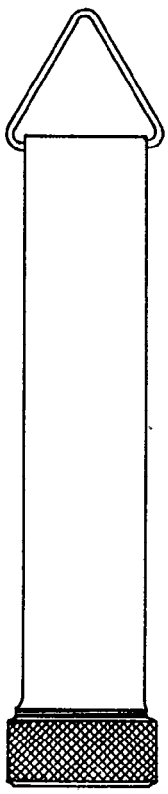
Figure 1 — Sampling bottle

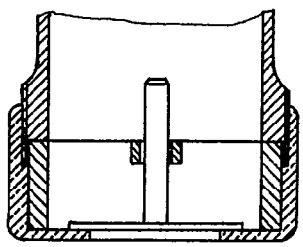


a) Lowering position

b) Filling position

Figure 2 — Sampling tipping dipper





Enlarged section of valve

Figure 3 — Sampling cylinder

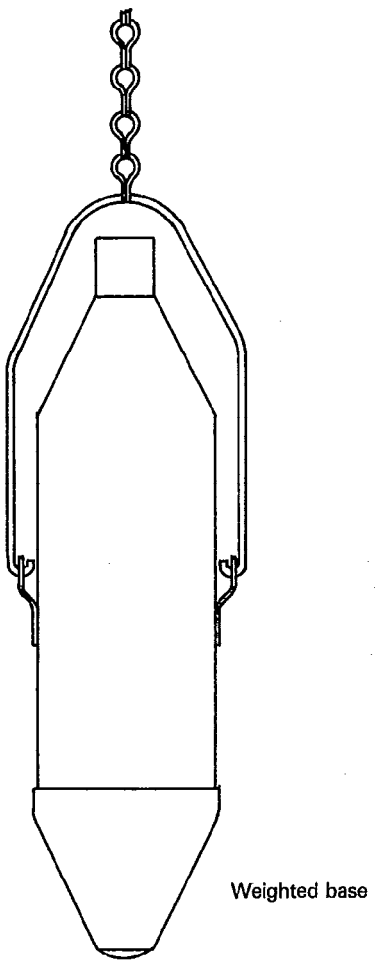


Figure 4 — "Go devil" sampling bottle

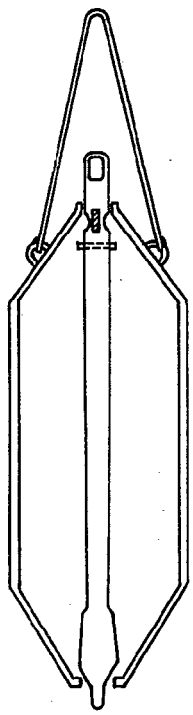


Figure 5 — Bottom or zone sampler (sectional view)

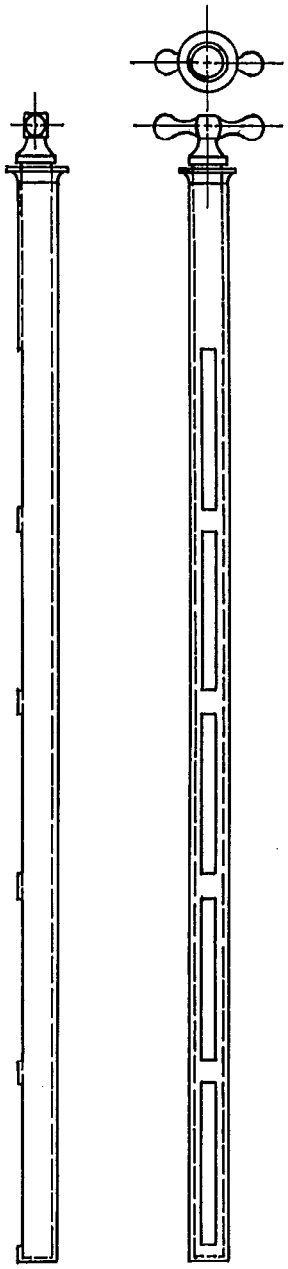


Figure 6 — Sampling tube consisting of two concentric tubes

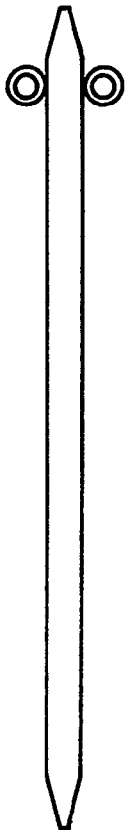


Figure 7 — Sampling tube with single tube

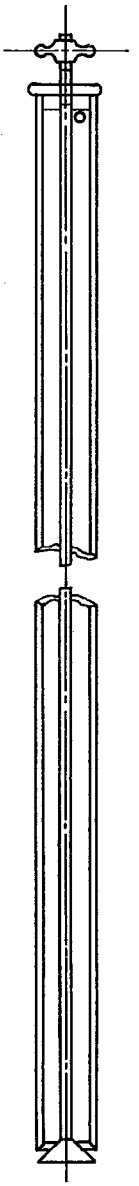


Figure 8 — Valve sampling tube

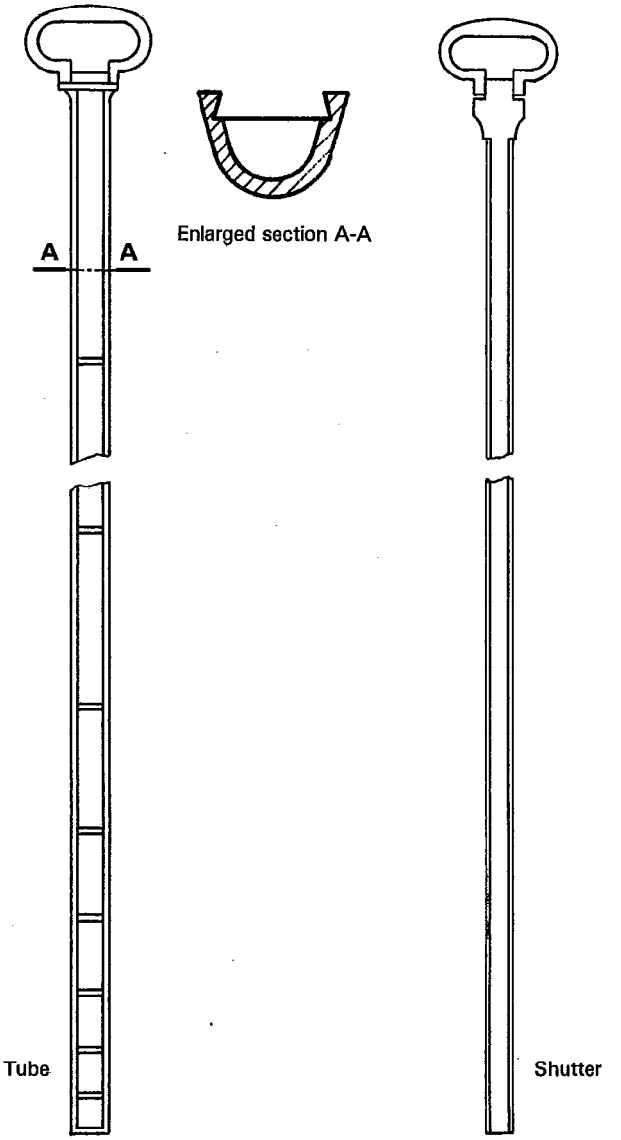


Figure 9 — Sampling scoop for liquids

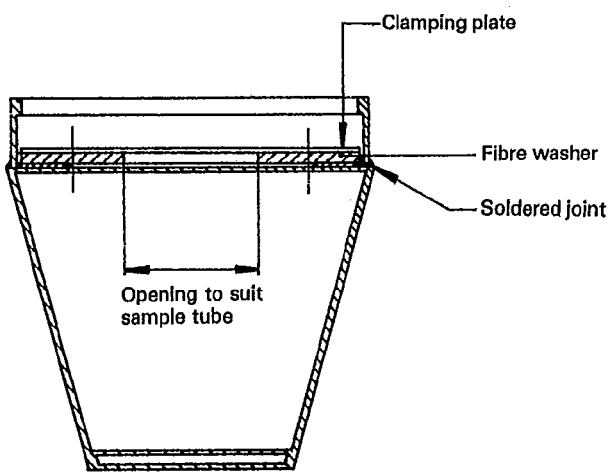


Figure 10 — Sampling tube withdrawal cleaner

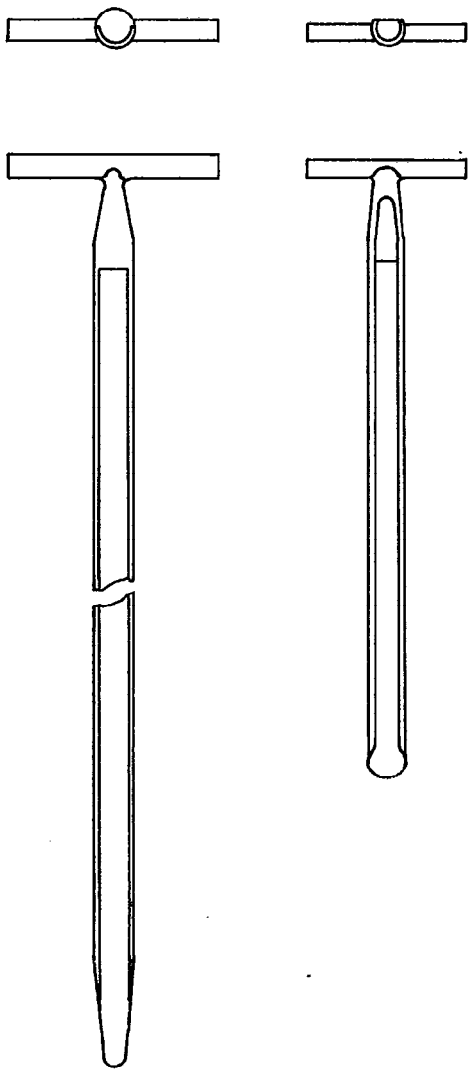


Figure 11 — Sampling scoops for solids