IS 101-1-1 (1986): Methods of sampling and test for paints, varnishes and related products, Part 1: Test on liquid paints (general and physical), Section 1: Sampling [CHD 20: Paints, Varnishes and Related Products]

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Indian Standard (Reaffirmed 2001 ~~XXXX~~ 2007)

METHODS OF SAMPLING AND TEST FOR PAINTS, VARNISHES AND RELATED PRODUCTS

PART 1 TESTS ON LIQUID PAINTS (GENERAL AND PHYSICAL)

Section 1 Sampling

(Third Revision)

1. Scope

1.1 This standard prescribes methods of sampling for paints, varnishes and related products. It is one of a series of standard dealing with sampling and testing of these products. This standard aims at obtaining uniform samples of convenient size and adequately representative of the product being sampled. The sample or samples so obtained are suitable for examination and preparation prior to testing.

2. Types of Products

2.1 The sampling procedures appropriate for use with paints, varnishes and related products depend on the nature and the physical properties of the products. The following types of product may conveniently be distinguished.

Type A — Fluid products consisting of a single homogeneous liquid phase, such as varnishes and thinners.

Type B — Fluid products consisting of two liquid phases, such as emulsions.

Type C — Fluid products consisting of one or two liquid phases together with one or more solid phases. Such products are normally called 'paints' and include 'emulsion' paints.

Type D — Viscous products (which usually consist of one or more solid phases with small amounts of a liquid phase) such as putties, mastics, lutes, cements and pigment pastes in oil or varnish. This type also includes very viscous resinous materials.

Type E — Products in powder form.

3. Sampling Equipment

3.1 *General* — The sampling tools in general used for sampling raw materials, may also be used for sampling finished products. Sampling equipment is required for two separate operations:

a) Mixing the product to make it as homogeneous as possible, and

b) Taking a truly representative sample.

3.2 *Materials and Design* — All sampling equipment shall be made of material not subject to deterioration, unaffected by the products being sampled and incapable of contaminating the sample. The design of the equipment shall take into account convenience in use and ease of cleaning (for example, any grooves, acute internal angles, or areas which are inaccessible or difficult to inspect for cleanness, shall be avoided).

3.3 *Apparatus for Mixing* — Broad-bladed stirrers of suitable length to reach the bottom of the container being sampled. Mechanical stirrers may also be used.

NOTE—In certain circumstances, when stirring a product of low flash point or where an explosive hazard exists, the only metal permitted is bronze.

3.4 *Apparatus for Taking Samples*

3.4.1 Sampling tubes glass or metal (*see* Fig. 1).

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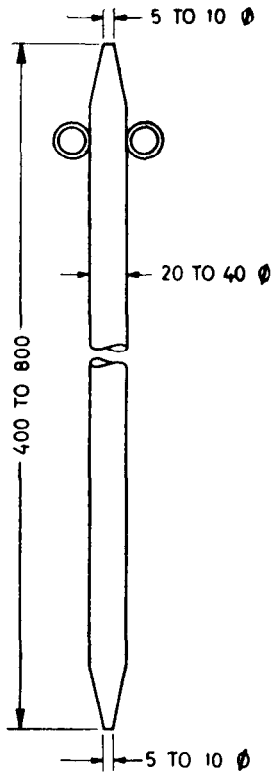

All dimensions in millimetres.

FIG. 1 SUITABLE DESIGN OF SAMPLING TUBE

3.4.2 Small dip cans.

3.4.3 Weighted sampling cans, with valve closures, for taking samples at all levels.

3.4.4 Scoops, triers or spatulas.

3.5 *Sample Containers* — New containers of suitable size and with large apertures shall be used. These may be:

a) metal containers of which the interior is not coated with varnish and which are fitted with tight metal closures; and

b) glass containers which can be tightly closed with closures which are not affected by the sample. Amber glass provides a partial protection against the action of light and the contents can be further shielded, if necessary, by an external opaque covering or packaging.

3.6 *Labels* — Suitable labels or other means of marking or identifying samples shall be provided.

3.7 *Cleaning of Sampling Equipment* — Strict cleanliness must always be observed. All sampling apparatus must be dry and free from residue, so as not to contaminate the sample. After each use, the apparatus shall be thoroughly cleaned with the aid, if necessary, of a brush or clean cotton rag, and shall then be rinsed with a suitable solvent.

4. Safety Precautions

4.1 A number of hazards may arise in the course of sampling. Many volatile products which are flammable or toxic may be present and hazards may arise from sparking or static electricity. The samplers must always be informed (this must be stated on the labels or packaged products) of the dangers arising from the nature of the products and must handle them with due care, using protective equipment, if required.

All statutory regulations concerning safety and hygiene shall be complied with.

5. Types of Sampling

5.1 There are two main types of sampling, which may be carried out corresponding to the following stages:

a) When the manufacture of the product has been completed but the product is still in the final manufacturing vessels, or when it is being transferred into the delivery containers (cans, drums, barrels, etc);

b) When sampling from the delivery containers which may also be bulk transport containers. Such sampling shall take place at the manufacturer's premises unless, by special agreement between the purchaser and the vendor, sampling is permitted at the purchaser's premises, in which case the product after receipt must not have been treated in any way.

6. Methods of Sampling

6.1 When the type of sampling specified in **5.1** (a) is required, the following procedures shall be applicable.

6.1.1 *For fluid products (Types A, B and C)* — When the sample is to be taken directly from the final manufacturing vessel, the product shall first be thoroughly stirred* and the sample taken by means of a suitable weighted sampling can from different levels† in the vessel. When the sample is to be taken in the course of transferring the product into the delivery containers, it shall be made up from small sub-samples taken at regular intervals during the filling process. In the former case, it is important to strain the sample before filling the sample container, using the same procedure as normally used when filling the delivery containers.

6.1.2 *For viscous or powdery products (Types D and E)* — The product shall be inspected in the final manufacturing vessel and, if uniform in appearance, the sample shall be taken from various parts of the bulk using a sampling tube, scoop or trier. Alternatively, a number of small samples can be taken at regular intervals during filling of the delivery containers.

6.2 When the type of sampling specified in **5.1** (b) is required, the following procedures shall be applicable.

6.2.1 *For fluid products (Types A, B and C)* — If the product is supplied in a bulk container, the same procedure applies as in **6.1.1** for sampling from the final manufacturing vessel. However, in the absence of a circulating pump or other means of agitation, it is usually necessary to take approximately equal size samples at different levels† in order to obtain a representative sample of the whole.

6.2.1.1 If the product is supplied in a consignment of containers, the total number of containers shall be noted and then a selection made at random of the containers for sampling. It is recommended that approximately $\sqrt{n/2}$ containers shall be sampled, where n is the total number of containers in the consignment (*see* Table 1). Only sound, unopened containers shall be chosen for sampling, unless it is desired specifically to examine damaged or opened containers.

TABLE 1 SAMPLING SCHEME

Number of Containers in Consignment (n)	Number of Containers to be Sampled
2 to 10	2
11 to 20	3
21 to 35	4
36 to 50	5
51 to 70	6
71 to 90	7
91 to 125	8
126 to 160	9
161 to 200	10

and thereafter one container for every additional 50 containers.

*Clear varnishes and similar products in settling tanks shall not be stirred before sampling.

†An additional safeguard to check the relative densities of samples taken from different levels and if these are not within the agreed tolerances, to continue stirring until the agreed tolerances are met.

The following procedures shall then be adopted:

a) Each selected container shall be opened in turn and examined for the presence of surface skin, separation of the contents (for example, water or sovent) or the presence of foreign matter.

b) After completing the removal of any surface skin if present, the stirrer shall be inserted into the container and the cxtent and type of settling, namely soft, hard or hard-dry, shall be noted. The presence or absence of a gel shall also be noted, care being taken not to confuse gelling and thixotropy*.

c) Any settled pigment shall be redispersed with the stirrer and the ease of redispersion noted. The closure shall then be replaced securely, the container shall be inverted and left inverted while the other containers are examined. Finally, the containers shall be shaken and rolled to effect complete redispersion and reincorporation of the pigment, preferably using mechanical means.

d) The containers shall be re-opened and examined for uniformity. Successive stirring, shaking and rolling shall then be continued until the contents are homogeneous, the bottom end of the stirrer being examined for undispersed pigment from time to time during the stirring. The time required to attain uniformity shall be noted.

e) When the contents of the containers have become homogeneous, they shall be sampled, using the small dip can to transfer the product to the sample container, which shall be filled so that there is an ullage (air-space) of about 5 percent. The container sampled and the sample container shall be closed and the sample container shall be cleaned on the outside and immediately labelled in accordance with **7.1**.

6.2.2 *For viscous products* (*Type D*) — These products are normally supplied in wide-aperture containers. Examine the condition of all the containers and select at random for sampling an appropriate number in accordance with Table 1. Open each of the selected containers, remove any protective covering and inspect the contents for homogeneity or separation of phases (for example, phases of oil, solvent or water). If the product appears homogeneous, or is made so by stirring, take a sample from the whole depth of the product in each selected container, using a suitable metal sampling tube or other suitable equipment, and place it in a suitable sample container which shall be filled so that there is an ullage (air-space) of about 5 percent. Close the sample container and label it in accordance with **7.1**.

6.2.3 *For powdery products* (*Type E*) — These products are normally supplied in sacks, paper or plastics bags, drums, barrels or plywood containers. Examine the condition of all the packages and select at random for sampling an appropriate number in accordance with Table 1. Open each of the selected packages and take, from various parts of each package, small portions of the product by means of a suitable sampling instrument and close the packages. Place these portions in a suitable sample container, close the container, mix the contents thoroughly by shaking, and label in accordance with **7.1**.

7. Labelling and Sealing of Samples

7.1 *Labelling* — The containers shall be labelled 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 labels and marking ink used shall be capable of withstanding moisture and any solvents contained in the sample. The label shall not be attached to the stopper, but to the neck or body of the containers.

It is recommended that the following particulars, whatever applicable shall be given on the label:

a) The name of the manufacturer code, if necessary, and a description of the product;

b) The quality and particulars of the consignment;

c) The reference number of the batch, storage tank, barrel, etc;

d) The dates of manufacture and of sampling;

e) The total number of samples taken from the consignment;

*Both thixotropic and gelled paints and varnishes have a jelly-like consistency, but whereas the consistency of the former is markedly reduced by stirring or shaking, the consistency of a gelled paint or varnish cannot be reduced in this way.

f) The designation and reference number of the sample (where the samples are drawn from a certain number of selected containers, the latter shall be numbered);

g) The consignor;

h) The place of sampling; and

j) The name of the sampler.

7.2 *Sealing* — After a sample container has been closed and labelled it shall be sealed in such a way that the contents and label cannot be removed without breaking the seal.

EXPLANATORY NOTE

In the preparation of this standard considerable assistance has been derived from ISO 1512-1974 'Paints and Varnishes — Sampling' issued by International Organization for Standardization (ISO).

This standard supersedes **3** of IS : 82-1973 'Method of sampling and test for thinners and solvent for paints (*first revision*)', IS : 85-1950 'Methods of test for oil pastes for paints' and IS : 197-1969 'Methods of sampling and test for varnishes and lacquers (*second revision*)'.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960 'Rules for rounding off numerical values (*revised*)'.

It was decided to bring the revision in eight parts as indicated below, each part covering a broad characteristic and each part having several sections dealing with individual test methods:

Part 1 Tests on liquid paints (general and physical)
Part 2 Tests on liquid paints (chemical examination)
Part 3 Tests on paint film formation
Part 4 Optical tests on paint films
Part 5 Mechanical tests on paint films
Part 6 Durability test on paint films
Part 7 Environmental tests on paint films
Part 8 Tests for pigments and other solids

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