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“जानने का अधिकार, जीने का अधिकार”

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“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 101-1-3 (1986): Methods of sampling and test for paints, varnishes and related products, Part 1: Test on liquid paints (general and physical), Section 3: Preparation of panels [CHD 20: Paints, Varnishes and Related Products]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartḥari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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AMENDMENT NO. 1 JANUARY 1998
TO
IS 101 (Part 1/Sec 3) : 1986 METHODS OF SAMPLING
AND TEST FOR PAINTS, VARNISHES AND RELATED
PRODUCTS
PART 1 TESTS ON LIQUID PAINTS (GENERAL AND PHYSICAL)
Section 3 Preparation of Panels
(Third Revision)

(Page 1, clause 2.1.1, para 1) — Substitute the following sentence for the existing last sentence:

'The burnishing operation by the use of power tools shall be as follows:'

(CHD 020)

4076 BIS/08—1

Indian Standard

METHODS OF SAMPLING AND TEST FOR PAINTS,
VARNISHES AND RELATED PRODUCTS
PART 1 TESTS ON LIQUID PAINTS (GENERAL AND PHYSICAL)
Section 3 Preparation of Panels
(Third Revision)

1. **Scope** — Prescribes procedures for the preparation, prior to painting of standard panels for use in general methods of test for paints, varnishes and related products.

1.1 This standard covers the following types of standard panels:

- a) Steel panels,
- b) Tin plate panels,
- c) Aluminium panels,
- d) Glass panels,
- e) Wood panels, and
- f) Cement/asbestos panels.

2. **Steel Panels**

2.1 Steel panels used for general testing shall be of mild steel, fully finished of deep drawing quality (see IS : 513-1963 Specification for cold rolled carbon steel sheets) size $150 \times 100 \times 1.25$ mm, free from surface imperfections, such as rolling marks and scores and scale, and shall be commercially available flat skin passed high grade sheet with minimum surface blemishes suitable for a high standard of surface finish.

2.1.1 Before use, wipe the mild steel panels free from excess oil, roughly degrease with petroleum hydrocarbon solvent conforming to IS : 1745-1978 'Specification for petroleum hydrocarbon solvents (second revision)' or xylene conforming to IS : 359-1965 'Specification for xylene, industrial solvent grade (revised)' and burnish uniformly with IS Grit No. 180 emery cloth conforming to IS : 715 (Part 1)-1976 'Specification for coated abrasives: Part 1 General application (third revision)'. Burnish lightly with petroleum hydrocarbon solvent conforming to IS : 1745-1978 'Specification for petroleum hydrocarbon solvents (second revision)' to avoid embedding emery in the surface. The burnishing operation shall be as follows:

- a) Straight across the panel, in a direction parallel to any one side;
- b) Perpendicular to first direction and until all signs of original burnishing have been obliterated; and
- c) With a circular motion of diameter approximately 75 mm, until a pattern consisting of circular burnishing marks superimposed one upon another is produced.

Remove the traces of emery dust by wiping with a linen rag.

2.1.2 Degrease the panel by swabbing two or three times with a linen rag, soaked in suitable hydrocarbon solvent. Final swabbing shall be done with a clean rag soaked in clean hydrocarbon solvent. Dry the panels slightly to remove traces of condensed moisture, allow to return to room temperature and then paint without delay. The prepared surfaces should not be touched by hand or otherwise between degreasing and painting.

3. **Tinplate Panels**

3.1 **Material** — The panel shall be of tinned steel plate made by the cold reduction process. The steel substance shall have a nominal thickness of 0.3 mm and the tin coating shall be equivalent to a mass of 24.0 g/m^2 .

3.2 **Preparation by Solvent Cleaning** — It is not necessary for tinplate panels to be specially protected in storage before use in the same way as steel panels; nevertheless, the surface of the panels may be contaminated with lubricants during processing. It is therefore recommended that the panels should be cleaned before use by the procedure specified in 3.3 for steel panels.

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3.3 Preparation by Abrasion (Burnishing) — Burnished tinplate panels are recommended where a more uniform test surface is required that is produced by solvent cleaning. The burnishing operation shall be carried out as for steel panels (see 2.1.1) except that it shall be done much more lightly to avoid embedding abrasive in the surface and completely removing the tin coating in some places. It is therefore recommended to use a good quality, fine silicon carbide paper, for example, one with an abrasive grain size corresponding to 320 silicon carbide grit.

3.3.1 The burnishing operation shall be continued until the whole of the surface of the panel is covered by a pattern of circular burnishing marks superimposed one upon another and the original surface pattern is no longer visible to the naked eye.

3.3.2 The burnished panels shall be cleaned thoroughly before use according to the procedure specified in 2.1.2 to ensure that all loose grit, tin particles and other contaminants are removed. Care shall be taken to ensure that the surface of the finally cleaned panel is not touched by hand or otherwise contaminated. If the paint coating cannot be applied immediately, the cleaned panels shall be stored for a few days only in a desiccator until required.

4. Aluminium Panels

4.1 Material — Aluminium panels intended for general testing (in contrast to aluminium or aluminium alloy panels required for testing to particular applications and uses) shall be of sheet or strip complying with the chemical composition (99.0 percent purity). Either soft (annealed) or hard materials shall be used, as specified for the particular test method. The hard aluminium shall have a tensile strength of at least 150 N/mm² and the soft aluminium a tensile strength not greater than 105 N/mm². The thickness and other dimensions of the panel shall be as specified in the test method or otherwise agreed. The sheet and strip shall not show any cracks when a test piece of the metal 20 mm wide and of convenient length, cut with the longer axis transverse to the direction of rolling and with the longer edges carefully rounded and smoothed longitudinally, if bent through 180° flat upon itself in the case of soft aluminium, or through 180° on a cylindrical former of radius equal to the thickness of the sheet in the case of hard aluminium.

4.2 Preparation by Solvent Cleaning — Where clean panels are required without further preparation, the cleaning procedure used shall be that specified in 2.1.2 for steel panels.

4.3 Preparation by Abrasion (Burnishing) — Where burnished panels are required, the procedure shall be essentially as specified in 2.1.1 for steel panels, except that the abrasive used shall be calcined alumina conforming to the following specification:

Particles greater than 63 μm	10 percent maximum
Particles less than 20 μm	70 percent minimum
Particles less than 10 μm	60 percent minimum

4.3.1 The sequence of burnishing operations shall be as specified in 2.1.1 but the abrasive shall be wetted with mineral solvent for paint (white spirit) and applied to the panel surface on a pad of soft cloth or other suitable material.

4.3.2 The burnishing operation shall be continued until the whole of the surface of the panel is covered by a pattern of circular burnishing marks superimposed one upon another and the original surface pattern is no longer visible to the naked eye.

4.3.3 The burnished panels shall be cleaned thoroughly before use according to the procedure specified in 2.1.2, to ensure that all loose grit, aluminium particles and other contaminants are removed. Care shall be taken to ensure that the surface of the finally cleaned panel is not touched by hand or otherwise contaminated. Aluminium panels shall only be prepared immediately prior to painting because if stored an oxide film is liable to form on the surface.

4.4 Preparation by Acid Chromating — Where aluminium panels are prepared by acid chromating for general testing (in contrast to those required for testing to particular applications and uses), it is recommended that the following procedure shall be used.

4.4.1 Clean the panels as specified in 2.1.2 until, after allowing the solvents to evaporate, it can be uniformly wetted with water and immerse them for 20 min at $55 \pm 5^\circ\text{C}$ in an acid chromate solution contained in a glass or polyethylene vessel. The solution shall be prepared as follows:

Dissolve 100 g of analytical reagent quality potassium or sodium dichromate in 1 000 ml of distilled water and add slowly, while stirring, 170 ml of analytical reagent quality sulphuric acid (1.84 g/ml). [See IS : 266-1977 Specification for sulphuric acid (*second revision*).]

(SAFETY WARNING : When preparing and using acid chromate solutions, the operator shall wear safety goggles and rubber gloves.)

4.4.2 Remove the panels from the solution and wash them thoroughly and as rapidly as possible in cold and then in hot distilled water (or demineralized water of specific resistance of at least 10^5 ohm-cm). Allow the panels to dry and then coat them as soon as possible with the paint. Care shall be taken to ensure that the prepared surface is not touched by hand or otherwise contaminated before painting.

Note — The chromate solution will become exhausted with use and shall be renewed when necessary.

5. Glass Panels

5.1 *Material* — The panels shall be of float or polished plate glass. The thickness and other dimensions of the panels shall be specified in the test method or otherwise agreed.

5.2 *Preparation by Solvent Cleaning* — The panels shall be cleaned by the procedure specified in 2.1.2 for steel panels.

5.3 *Preparation by Detergent Cleaning* — The panels shall be washed thoroughly in a warm, aqueous, non-ionic detergent solution and then rinsed thoroughly with warm distilled water (or demineralized water of specific resistance of at least 10^5 ohm-cm).

5.3.1 The cleaned panels shall be dried by evaporation of the final washing water and may be slightly warmed to remove any traces of condensed moisture. Care shall be taken to ensure that the prepared surface is not touched by hand or otherwise to prevent contamination before painting.

6. *Wood Panels* — Unless specified otherwise in the material specification, panels shall be made from teak wood (*Tectona grandis* Lin. f., fam. *Verbenaceae*) and shall be $200 \times 100 \times 100$ mm in size.

6.1 Wood panels shall be unused, flat grained and of even texture, and shall be free from knots, shakes, cracks and blemishes. The wood shall be well-seasoned and its moisture content shall not exceed 12 percent. The panel surface should be smooth and shall be rubbed with IS Grit No. 180 emery cloth conforming to IS : 715 (Part 1)-1976 'Specification for coated abrasives: Part 1 General applications (*third revision*)'. All surface dust shall be removed before painting by wiping with a clean and dry linen rag.

7. Cement/Asbestos Panels

7.1 *Concrete Panels* — Of size $150 \times 150 \times 125$ mm prepared as follows:

Cement [see IS : 269-1976 Specification for ordinary, and low heat portland cement (<i>third revision</i>)]	450 g
Sand [see IS : 650-1966 Specification for standard sand for testing of cement (<i>revised</i>)]	900 g
Aggregates [see IS : 383-1970 Specification for coarse and fine aggregates from natural sources for concrete (<i>second revision</i>)]	450 g
Water	180 g

Cast the mix into a mould $30 \times 30 \times 12.5$ cm in size, suitably partitioned to give four panels. Trowel cut the top surface of the block after compacting and levelling with a wooden float, taking care that all the material remain in the mould. The blocks are allowed to harden in air for 24 hours and then cured in water for 14 days. They are ready for use after this, and shall be stored in a place free from chemical fumes.

EXPLANATORY NOTE

This Indian Standard is one of the series dealing with sampling and testing of paints, varnishes and related products. For many of the widely used test methods, the type of panel used and the particular way in which it is prepared for use affect the test results to a significant degree. Consequently, it is important to standardize as carefully as possible both the panels and preparation procedure employed for these tests. It is equally desirable to reduce to a minimum the number of different standard panels required for use in a paint testing laboratory. In the preparation of this standard considerable assistance has been derived from ISO 1514-1984 'Paints and Varnishes — Standard panels for testing' issued by the International Organization for Standardization (ISO). This standard supersedes 5 of IS : 101-1964 'Methods of test for ready mixed paints and enamels (*second revision*)'.