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मानक

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

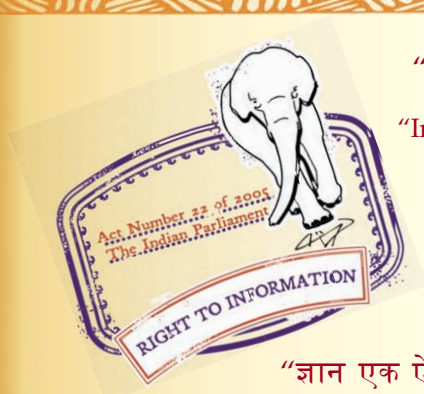
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 101-7-3 (1990): Methods of sampling and test for paints, varnishes and related products, Part 7: Environmental tests on paint films, Section 3: Resistance to heat [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”

Bhartrihari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

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रोगनों, वार्निशों और सम्बद्ध उत्पादों के नमूने लेने और परीक्षण की पद्धतियाँ

भाग 7 रोगन फिल्मों के पर्यावरणीय परीक्षण

अनुभाग 3 उष्मा प्रतिरोध

(तीसरा पुनरीक्षण)

Indian Standard

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

PART 7 ENVIRONMENTAL TESTS ON PAINT FILMS

Section 3 Resistance to Heat

(*Third Revision*)

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FOREWORD

This Indian Standard (Part 7/Sec 3) (Third Revision) was adopted by the Bureau of Indian Standards on 29 January 1990 after the draft finalized by the Paints and Allied Products Sectional Committee had been approved by the Chemical Division Council.

This standard is one of a series dealing with sampling and testing of paints, varnishes and related products. In the preparation of this standard, considerable assistance has been derived from ISO : 3248-1975 Paints and varnishes — Determination of the effect of heat published by the International Organization for Standardization (ISO) and ASTM D 2485-1968. This standard supersedes 22 of IS 101 : 1964 Methods of test for ready mixed paints and enamels (*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*)'.

**AMENDMENT NO. 1 JUNE 1997
TO
IS 101 (Part 7/Sec 3) : 1990 METHODS OF
SAMPLING AND TEST FOR PAINTS, VARNISHES
AND RELATED PRODUCTS**

PART 7 ENVIRONMENTAL TESTS ON PAINT FILMS

Section 3 Resistance to Heat

(Third Revision)

(Page 1, clause 5.2, line 8) — Substitute 'minimum of 16 hours for stoved paint and minimum of 48 hours for air dried paints' for 'minimum of 16 h'.

(CHD 020)

Reprography Unit, BIS, New Delhi, India

Indian Standard

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

PART 7 ENVIRONMENTAL TESTS ON PAINT FILMS

Section 3 Resistance to Heat

(Third Revision)

1 SCOPE

1.1 This standard (Part 7/Sec 3) prescribes the methods for sampling and tests for the evaluation of the heat resistant properties of coatings designed to protect steel surfaces exposed to elevated temperatures.

1.2 The following three methods are prescribed depending upon the intended usage:

- a) Coatings for domestic radiators or other articles likely to be subjected to similar temperatures,
- b) Coatings designated for interior service, and
- c) Coatings designated for exterior (weather-exposed) service.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

IS No.	Title
101 (Part 1/ Sec 1) : 1986	Methods of sampling and test for paints, varnishes and related products: Part 1 Tests on liquid paints (general and physical), Sec 1 Sampling (<i>third revision</i>).
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), Sec 3 Preparation of panels (<i>third revision</i>)
101 (Part 3/ Sec 2) : 1990	Methods of sampling and test for paints, varnishes and related products: Part 3 Tests on paint film formation, Sec 2 Film thickness (<i>third revision</i>)

3 SAMPLING

3.1 A representative sample of the material shall be drawn as prescribed in IS 101 (Part 1/Sec 1) : 1986.

4 APPARATUS

4.1 Oven with Air Circulation Arrangement

The oven shall be capable of being maintained at $125 \pm 2^\circ\text{C}$.

4.2 Muffle Furnace, thermostatically controlled.

4.3 Mandrel, 12.5 mm diameter, made of steel.

5 TEST PANELS

5.1 The test panels, unless otherwise specified, shall be of steel, tin plate or aluminium and prepared as prescribed in IS 101 (Part 1/Sec 3) : 1986. The panel shall normally be 150 mm \times 100 mm \times 1.25 mm.

5.2 The panels shall be coated by the specified method with the product or system under test. The coated panels shall be dried (or stoved) for the specified time and under the specified conditions and, unless otherwise specified, shall be conditioned at a temperature of $27 \pm 2^\circ\text{C}$ and 65 ± 5 percent relative humidity for a minimum of 16 h. The test shall then be carried out as soon as possible.

5.3 The thickness of the dry coating shall be commensurate with the mass per 10 litres of the material as specified in Table 1, when tested as prescribed in IS 101 (Part 3/Sec 2) : 1990

Table 1 Dry Film Mass for Test Purposes
(Clause 5.3)

Mass of the Wet Material kg/10 litres	Limits of Dry Film Mass g/m ²
Up to and including 10	17 to 22
Above 10 to 11	22 to 27
Above 11 to 12	27 to 34
Above 12 to 14	34 to 44
Above 14 to 16	44 to 54
Above 16 to 18	54 to 68
Above 18	68 to 80

6 METHOD A

6.1 Place the panels in an oven with air circulation at 125°C, not less than 100 mm from the sides of the oven and not closer than 20 mm apart, and maintain them at that temperature for the specified time. The preferred method of ensuring even heating of the coated panels is to suspend them by means of fine wires. Alternatively, the panels may be supported in a rack made from suitable heat insulating material or placed, paint side uppermost, on a piece of asbestos board resting on supports.

6.2 At the end of the specified time, remove the panels from the oven and allow them to cool at room temperature. Examine the panels for change of colour or signs of other deterioration of the coating, by comparison with identically prepared but unheated panels.

7 METHOD B

7.1 Place two panels described in 5.1 coated with each paint under test in a muffle furnace maintained at the test temperature mutually agreed upon between the purchaser and the supplier and allow to remain for 24 h.

7.2 At the end of this time plunge one of the panels immediately into water maintained at 20 ± 2°C. After removing from the water, examine the coating film for evidence of film failure including dulling, blistering, cracking and loss of adhesion.

7.3 Allow the second panel to cool at room temperature for 1 h, then rapidly bend double over steel mandrel with coated side uppermost. Examine this panel for such evidence of film degradation as cracking and loss of adhesion.

8 METHOD C

8.1 Expose duplicate coated panels finished with the materials under test to elevated temperature test schedule mutually agreed upon between the purchaser and the supplier. In the absence of such a specialized schedule, observe the following procedure:

8.1.1 Panels should be introduced into the muffle furnace at ambient temperature and the temperature should be raised to the specified value of 200°C. Maintain at 200°C for 8 h; then increase the temperature to 250°C for 16 h. Increase the temperature in 50°C increments, alternating the time cycles indicated, to the final temperature maximum previously agreed to between the purchaser and the supplier. A typical schedule is as follows:

200°C for 8 h
250°C for 16 h
300°C for 8 h
350°C for 16 h
400°C for 8 h

8.1.2 Make a visual inspection of the test panels following exposure at each temperature level for evidence of failure (including peeling, cracking, blistering, abnormal discoloration, or loss of adhesion) by comparing against an identically painted but unheated panel. The failures up to 6.5 mm from the edges of the test panels shall be disregarded.

8.1.3 At the end of the elevated temperature exposure, remove the panels from the oven or muffle furnace and allow to air cool at room temperature for a minimum period of 1 h. Make an inspection similar to that described in 8.1.2 for evidence of failure due to high temperature exposure.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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