IS 101-5-3 (1999): Methods of Sampling and Test for Paints, Varnishes and Related Products, Part 5: Mechanical Tests, Section 3: Impact Resistance [CHD 20: Paints, Varnishes and Related Products]

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IS 101 (Part 5/Sec 3) : 1999

(Reaffirmed 2004)

भारतीय मानक

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

भाग 5 यांत्रिक परीक्षण

अनुभाग 3 संघट्ट प्रतिरोधिता

(चौथा पुनरीक्षण)

Indian Standard

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

PART 5 MECHANICAL TESTS

Section 3 Impact Resistance

(Fourth Revision)

ICS 19.060; 87.040

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 1999

Price Group 3

FOREWORD

This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Paints (Other Than Industrial Paints) and Allied Products Sectional Committee had been approved by the Chemical Division Council.

This standard, which was earlier published in 1988, is one of a series dealing with sampling and testing of paints, varnishes and related products.

In this revised version, an alternate method of test has been incorporated.

In the preparation of this standard considerable assistance has been derived from ISO 6272 : 1993 'Paints and varnishes — Falling-weight test', issued by the International Organization for Standardization (ISO).

The composition of technical committee responsible for the formulation of this standard is given in Annex A.

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*)'.

Indian Standard

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

PART 5 MECHANICAL TESTS

Section 3 Impact Resistance

(Fourth Revision)

1 SCOPE

This standard prescribes two methods, for determining the resistance of impact on paint films, using a free falling ball.

2 REFERENCE

The Indian Standard listed below contains provisions which through reference in this text, constitutes provision of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

IS No.	*Title*
101 (Part 1/ Sec 3)	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)*

3 METHOD A

3.1 Apparatus

3.1.1 *Hardened Steel Ball* — Approximately 60 mm in diameter and of mass 900 ± 10 g, unless otherwise specified.

3.1.2 *Device* — For example, an electromagnet for holding and releasing the steel ball at a specified height above the test panel.

3.1.3 *Supporting Frame* — Frame on which the test panel rests horizontally, so as to leave an area of 180 mm × 180 mm unsupported.

3.2 Panels

3.2.1 *Material and Dimensions* — Unless otherwise specified or agreed, the test panel shall be of burnished steel, approximately 200 mm × 200 mm and at least 5 mm thick.

3.2.2 The test panels shall be prepared as given in IS 101 (Part 1/Sec 3).

3.2.3 The panels shall be dried (or stored and aged) for the specified time and under specified conditions as given in material specification. It shall be conditioned at 27 ± 2°C and 65 ± 5 percent relative humidity for a minimum period of 16 h and test shall be carried out as soon as possible after that.

3.3 Procedure

3.3.1 Place the panel on the supporting frame with the test coating facing upwards or downwards as specified. Release the steel ball and allow it to fall freely from a height of 3 m, unless otherwise specified, so that it strikes the panel approximately in the centre. Repeat this procedure in a manner that the second point of impact is as close to the first as possible and, in any case, is not apart by more than 20 mm.

3.3.2 Remove the panel from the supporting frame and examine the coating for signs of cracking, flaking detachment from the substrate.

4 METHOD B

4.1 Apparatus

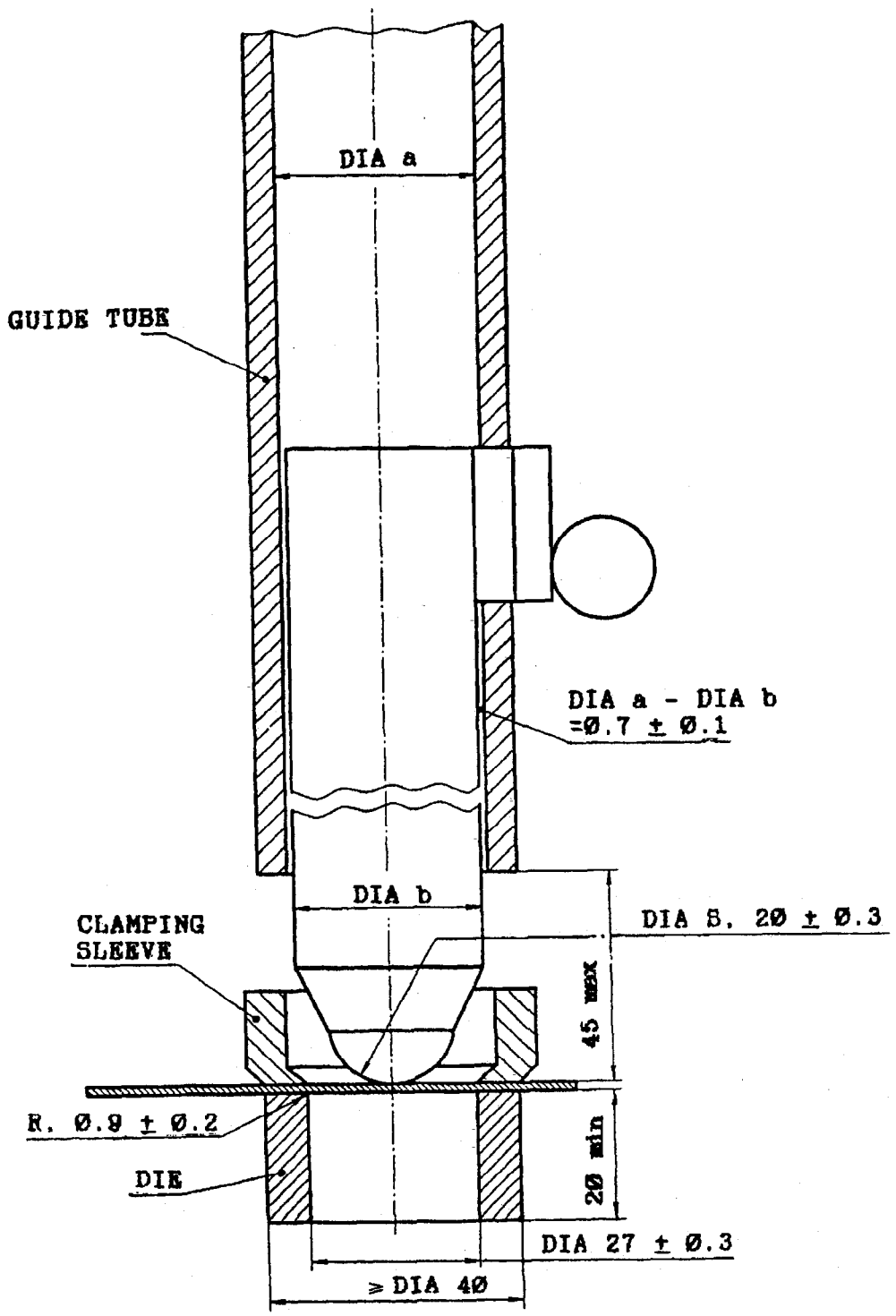
4.1.1 *Falling-Weight Apparatus* — comprising the elements described in **4.1.1.1** to **4.1.1.6** and detailed at Fig. 1 and 2.

4.1.1.1 *Base stand,* of sufficient mass to support the die as described in **4.1.1.4**.

4.1.1.2 *Falling-weight* — The head having the shape of a spherical sector of diameter 20 ± 0.1 mm and a total mass of 1 000 ± 1 g.

4.1.1.3 *Vertical guide tube* — To direct the falling weight perpendicularly on to the test panel. The guide tube may be graduated, in millimetres, over 1 m from the surface of the test panel upward.

To avoid excessive friction and to ensure accurate guidance, the difference between the inner diameter of the guide tube and the outer diameter of the falling-weight shall be 0.7 ± 0.1 mm and the distance between the bottom end of the guide tube and the top of the test panel shall be not more than 45 mm.



All dimensions in millimetres.

FIG. 1 FALLING-WEIGHT APPARATUS SHOWING REQUIRED DIMENSIONS

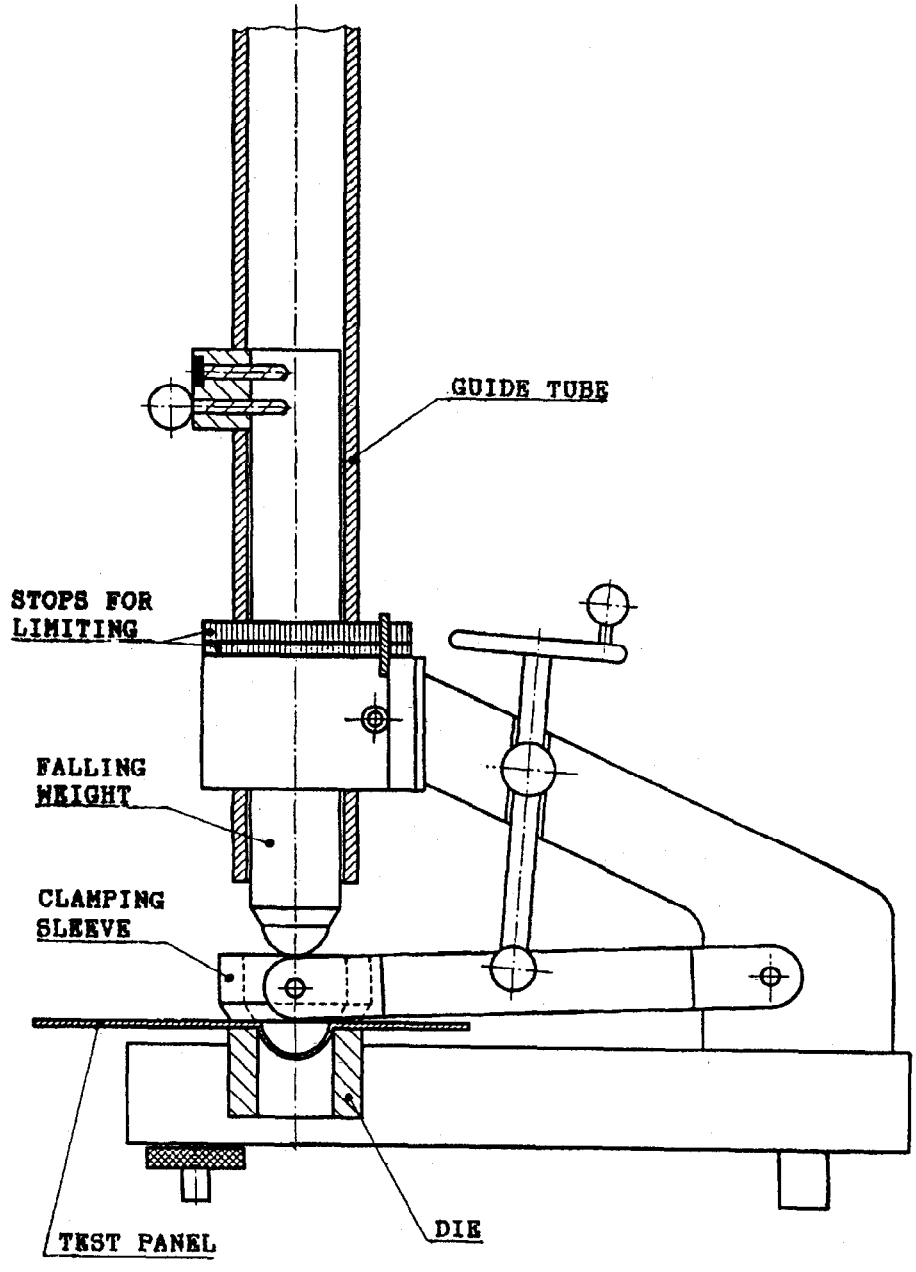


FIG. 2 SIDE-VIEW OF FALLING-WEIGHT APPARATUS

4.1.1.4 *Die* — Ring-shaped with an inner diameter of 27 ± 0.3 mm. The inner upper edge of the ring shall be founded with a radius of curvature of 0.9 ± 0.2 mm. The minimum height of the ring shall be 20 mm.

4.1.1.5 *Clamping sleeve* — To hold the test panel in position. The inner diameter at the bottom shall be the same as that of the die 27 ± 0.3 mm.

4.1.1.6 *Stops* — Of different thicknesses, to limit the indentation depth of the falling weight.

4.1.7 *Viewing Lens* — Hand-held, with an enhanced magnification of ten times.

4.2 Panels

4.2.1 Unless otherwise specified, the test panel shall be of burnished steel of such size as to allow the test to be carried out for at least five different positions not within 40 mm from each other and not within 20 mm from the edge of the panel. The panels shall be at least 0.25 mm thick.

4.2.2 The test panels shall be prepared as specified in IS 101 (Part 1/Sec 3).

4.2.3 The panels shall be dried (or stored and aged) for the specified time and under specified conditions as given in material specification. It shall be conditioned at 27 ± 2°C and 65 ± 5 percent relative humidity for a minimum period of 16 h and test shall be carried out as soon as possible after that.

4.3 Procedure

4.3.1 Ensure that the guide tube (*see* **4.1.1.3**) is vertical and adjusted to a height of 3 m, unless otherwise specified. Place the panel on the base stand (*see* **4.1.1.1**) in position of means of clamping sleeve (*see* **4.1.1.5**) with the test coating facing upwards or downwards as specified. Release the weight (*see* **4.1.1.2**) and allow it to fall freely on to the test panel. Repeat the test a further four times at different positions (giving a total of five drops).

4.3.2 Remove the panel from the clamping device and examine the coating for signs of cracking, flaking or peeling from the substrate.

4.3.3 Report the coating as satisfactory if at least four test positions show no cracking, flaking or peeling from the substrate.

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

Paints (Other Than Industrial Paints) and Allied Products Sectional Committee, CHD 20

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(*Continued from page* 5)

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Methods of Test Subcommittee, CHD 20:1

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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