

IS : 1491 - 1959

Indian Standard

SPECIFICATION FOR METRIC SCALES FOR ARCHITECTURAL PURPOSES

First Reprint FEBRUARY 1964
Second Reprint OCTOBER 1967

UDC 389.151:531.716.1:72.022



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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 1

~~Price Rs. 2.50~~

Cr 2

Revised Price

Rs. 5-00

February 1960

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0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 16 November 1959, after the draft finalized by the Optical and Mathematical Instruments Sectional Committee had been approved by the Engineering Division Council.

0.2 This standard is one of a series of Indian Standards on metric scales being prepared by the Institution in connection with the changeover to the metric system; the other standards in the series are:

IS : 1480-1960 METRIC SCALES FOR GENERAL PURPOSES

IS : 1481-1961 METRIC STEEL SCALES FOR ENGINEERS

IS : 1482-1960 METRIC SCALES FOR USE WITH DRAFTING MACHINES

0.3 Throughout this standard, the term 'scale' has been used to denote the ratio of enlargement or reduction to which the drawings are to be made from these scales. The term 'Scale' (with *S* in capital) has been used to indicate a strip of material of suitable cross-section with figured divisions along the edge or edges so that dimensions may be read or transferred to a drawing or map.

0.4 The scales specified in this standard are based on the reduction scales recommended for general engineering purposes in *IS : 696-1955 Code of Practice for General Engineering Drawings. In addition, scales of 1 : 500 and 1 : 1000, used mostly for preparation of drawings for construction of roads, bridges and railways, have been included. A set of paper Scales will, therefore, comprise of six different pieces of Scales with which architects, engineers and surveyors are mostly concerned.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with the latest version of *IS : 2-1949 Rules for Rounding Off Numerical Values. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Since revised.

0.6 This standard is intended chiefly to cover the technical provisions relating to metric Scales used for architectural purposes, and it does not include all the necessary provisions of a contract.

1. SCOPE

1.1 This standard covers the requirements for metric Scales, made of varnished cardboard or of plastic material, used by architects, engineers and surveyors.

2. SCALE DESIGNATIONS

2.1 This standard recognizes six different scales, designated as A, B, C, D, E and F, and marked with 12 different scales of reduction as given below:

A	{	full size	(1 : 1)
		50 cm to a metre	(1 : 2)
B	{	40 cm ,,	(1 : 2·5)
		20 cm ,,	(1 : 5)
C	{	10 cm ,,	(1 : 10)
		5 cm ,,	(1 : 20)
D	{	2 cm ,,	(1 : 50)
		1 cm ,,	(1 : 100)
E	{	5 mm ,,	(1 : 200)
		2 mm ,,	(1 : 500)
F	{	1 mm ,,	(1 : 1 000)
		0·5 mm ,,	(1 : 2 000)

3. MATERIALS

3.1 Paper Scales — Cardboard paper or paper-backed cardboard shall be used for printing the Scales. A single composite white cardboard of the type commonly known as duplex, triplex and mill-board shall be preferred (namely, Bristol Board). The finish of the surface shall be preferably glossy. The cardboard from which the blanks are cut shall be smooth, and shall be free from any visible defects like decay, insect attacks, etc. The material shall be able to stand atmospheric moisture under normal conditions.

3.2 Plastic Scales — Rigid polyvinyl chloride or polyvinyl chloride copolymer sheets shall be used for the purpose. The sheets shall be smooth, even on all sides and free from blisters, porosity and other defects.

4. DIMENSIONS AND GRADUATIONS

4.1 The leading dimensions of the Scales shall be as shown in Fig. 1.

4.2 **Graduations** — The Scales shall be divided and subdivided as shown in Fig. 1. They shall be graduated on both the edges on one face only.

4.2.1 Graduations shall consist of fine, clear lines of uniform thickness. The thickness of the finest lines for the subdivisions of the Scale shall be 0.10 mm and that for the main division shall be 0.15 mm.

4.2.2 The length of the graduating lines shall be as follows:

	mm
cm marks	6
5-mm marks	4
mm marks other than 5-mm	2.5
0.5-mm marks	1.5

4.2.3 The figuring shall be done as shown in Fig. 1. The height of the figures shall be between 2.0 and 2.5 mm.

5. ACCURACY

5.1 The maximum cumulative error over the entire length shall not exceed ± 0.25 mm, when the Scales are compared against a certified metal Scale.

6. MARKING

6.1 The designations (*see* 2.1) shall be marked at each end of the Scales and shall be 4 mm in height.

6.2 The ratio of reduction (*see* 2.1) shall be shown below the appropriate edge (*see* Fig. 1).

6.3 The letters 'cm' and 'सेमी' shall be marked at the end of the Scales.

6.4 Each Scales shall be legibly and indelibly marked with the maker's name or his trade-mark. The year of manufacture shall be marked on plastic Scales.

6.5 The Scales may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

7. FINISH

7.1 The Scales, when made of paper, shall be given a protective coating of overprinting varnish.

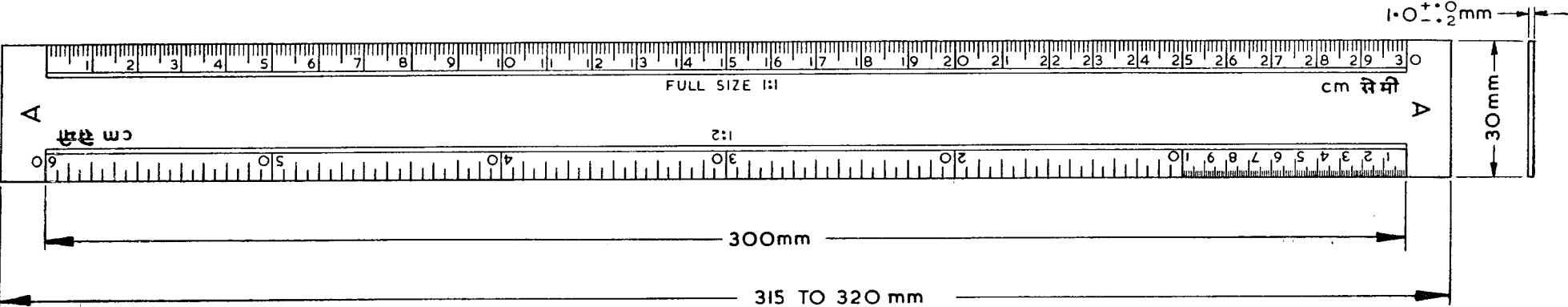
8. FLEXIBILITY TEST

8.1 The Scales shall be bent round in the form of a segment of a circle till the two ends are brought to a distance of about 20 cm apart. The Scales shall then be stretched and the operation repeated five times. The Scales shall not show any sign of permanent set after the test.

8.2 The Scales shall be held at the two ends and given a twist of 30° and then released. The Scales after this test shall not show any sign of warpage.

9. PACKING

9.1 Six pieces of Scales shall comprise a set and shall be packed in a suitably sized cardboard case bound in cloth. A table showing an index to 12 different scales from A to F shall be pasted over the casing so as to facilitate easy identification and selection.



NOTE - In the above figure, Scale A (1 : 1 and 1 : 2) has been illustrated and for Scale A 1 : 2 millimetre graduations have been shown only up to 10 cm.

FIG. 1 OVERALL DIMENSIONS OF METRIC SCALES FOR ARCHITECTURAL PURPOSES