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***भारतीय मानक***

***Indian Standard***

**स्टेंसिल पेपर — विशिष्टि**

(*तीसरा पुनरीक्षण*)

**Stencil Paper — Specification**

(*Third Revision*)

ICS 87.080

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भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली –110002

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARGNEW DELHI - 110002

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**September 2024 Price Group X**

Printing Inks, Stationery and Allied Products Sectional Committee, CHD 14

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Printing Inks, Stationery and Allied Products Sectional Committee had been approved by the Chemical Division Council.

This standard was first published in 1969 and subsequently revised in 1981 and 1993. In the first revision, the mass of coated stencil paper was reduced to 48 g/m2 keeping in view of its adequacy for the required performance. In the second revision, the requirement for mass of coated stencil paper was reduced from 48 g/m2 to 40 g/m2. Also, the requirement for backing sheet was modified.

In this revision, reference clause and packing and marking clause have been updated. Also, Amendment No. 1 has been incorporated. Now, the standard has been updated based on the technological advancements that may have taken place since the last publication of the standard.

The composition of the Committee responsible for formulation of this standard is given in Annex F.

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 or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second* *revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

STENCIL PAPER — SPECIFICATION

*( Third Revision )*

**1 SCOPE**

This standard prescribes requirements and methods of sampling and test for wax less stencil papers used on duplicating machines.

**2 REFERENCES**

The standards given below contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were 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 these standards:

|  |  |
| --- | --- |
| *IS No.* | *Title* |
| IS 170 : 2020 | Acetone — Specification (*fifth revision*) |
| IS 1060 (Part 1): 2022 | Methods of sampling and test for paper and allied products Part 1 Test methods for general purpose |
| IS 1070 : 2023 | Reagent grade water — Specification (*fourth revision*) |
| IS 4395 : 1987 | Glossary of terms relating to inks and allied industries (*first revision*) |
| IS 4905 : 2015  ISO 24153 : 2009 | Random sampling and randomization procedures (*first revision*) |

**3 TERMINOLOGY**

For the purpose of this standard, the definitions given in IS 4395 shall apply.

**4 REQUIREMENTS**

**4.1 Description**

**4.1.1** The stencil paper when cut on the typewriter or by a stylus by hand, shall be capable of rendering impressions when worked on a duplicating machine with duplicating ink. The impressions shall be of good definition and shall be free from patches, pin-holes, marks, etc when examined visually.

**4.1.2** The stencil paper may be free from any pronounced and disagreeable odour.

**4.1.3** The stencil paper may permit visibility of guides placed under it.

**4.2 Material**

The stencil-paper shall be of suitable fibrous tissue coated with non-wax-based film forming material.

**4.3 Elongation**

The average of the elongation in machine direction and cross direction shall be not more than 6 percent when tested by the method prescribed in IS 1060 (Part 1).

**4.4 Tensile Strength**

The average of the tensile strength in machine direction and cross direction shall be not less than 0.35 kg/cm width when tested by the method prescribed in IS 1060 (Part 1).

**4.5 Burst Factor**

The burst factor shall be not less than 7.5 when tested as prescribed in IS 1060 (Part 1).

**4.6 Mass of Coating**

The mass of coated stencil paper shall be not less than 40 g/m2 and the mass of the soluble coating shall be not less than 28 g/m2 when determined by the method prescribed in Annex A.

**4.7 Cut-Outs and Filling**

The stencil paper shall withstand the cut-outs and filling test as prescribed in Annex B.

**4.8 Use with Stylus**

The stencil paper shall show clear and uniform cutting with a stylus pen having a round (not sharp) point. It shall not tear or pull the paper at the time of writing with stylus per using a writing plate with normal uniform pressure and shall not show any feathering.

**4.9 Performance**

The stencil paper shall be capable of producing not less than 750 clear copies and then, after three days, another 500 copies without distortion, cracks or other failures that impair legibility. The cuts of the stencil shall allow the ink to flow readily to give clear impressions.

**4.10 Legibility of Typing**

The stencil paper shall be such that the cut stencil can be read easily against a lighted background.

**4.11 Moisture Resistance**

The stencil paper shall withstand the moisture resistance test prescribed in Annex C.

**4.12 Keeping Quality**

The stencil paper shall be capable of retaining its serviceability under normal storage conditions for not less than 2 years from the date of manufacture which shall be tested by the accelerated ageing test prescribed in Annex D.

**4.13 Backing Sheet**

Each sheet of stencil paper shall be properly backed with a backing sheet. The backing sheet shall conform to IS 3302 and shall be tested before collating the stencil paper to the backing sheet. The backing sheet head shall be suitably punched to enable it to be properly fitted to the respective duplicating machine for which the punching has been intended.

**4.14 Interleaving Sheet**

Each stencil paper shall be interleaved with a grease-proof paper or a sheet of carbon paper (single side or double side) as agreed to between the purchaser and the supplier. In case of single sided carbon paper, the facing of carbon coated paper shall be as agreed between the purchaser and supplier.

**4.15 Sizes**

The size of the stencil paper may be as agreed to between the purchaser and the supplier.

**4.16 Scale**

The limits up to which the cutting earl be done for different sizes of stencil papers including A3 or A4 size, as the case may be, shall be indicated on the stencil.

**5 PACKING AND MARKING**

**5.1 Packing**

Stencil sheets shall be securely packed in packets of 25, 50 or 100 as required or as agreed to between the purchaser and the supplier.

**5.2 Marking**

Each packet shall be marked with the following information:

1. Name and size of the material;
2. Number of sheets in the packet and the type of interleaving;
3. Indication of the source of-manufacture;
4. Month and year of manufacture; and
5. Batch number in code or otherwise to enable the lot of manufacture to be traced from records.

**5.2.1** *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

**6 SAMPLING**

The method of drawing representative samples of the material, number of tests to be performed and the criteria for conformity of the material to the requirements of this specification shall be as prescribed in Annex E.

**ANNEX A**

**(***Clause* 4.6)

**DETERMINATION OF MASS OF COATING**

**A-1 TEST PIECE**

Condition a stencil paper as prescribed in **A-2.1.1** and cut out a test piece measuring 10 cm × 10 cm. Weigh it accurately.

**A-2 DECOATING**

**A-2.1** Take a suitable quantity of acetone (*see* IS 170) in a beaker and immerse the test piece into the solvent until the tissue is clean. During this operation, hold the test piece with forceps and agitate through the solvent. Repeat the operation with a fresh quantity of solvent. After the coating has been completely removed, dry the decoated stencil paper, condition it (*see* **A-2.1.1**) and weigh accurately.

**A-2.1.1 Conditioning**

Suspend the test piece in conditioning chamber in which relative humidity of (65 ± 2) percent and temperature of (27 ±2) °C is maintained (temperature should not vary by more than ± 1 °C in a given series of tests) in such a way that conditioning atmosphere has free access to all its surfaces. The test piece shall be deemed to have reached equilibrium when the results of two consecutive weighing at an interval of one hour do not differ by more than 0.5 percent of the total mass.

**A-3 CALCULATIONS**

**A-3.1** Mass of coated stencil paper g/m2 **=**

where

= mass, in g, of test piece as determined in **A-1.1**; and

*A =* area, in m2, of the test piece.

**A-3.2** Mass of coating on the stencil paper, g/m2 =

where

*M*1 = mass, in g, of the test piece before decoating;

*M*2 = mass, in g, of the test piece after decoating; and

*A* = area in m2 of the test piece.

NOTE — Paper scale calibrated to give direct reading in g/m may be used for weighing the test piece.

**ANNEX B**

(*Clause* 4.7)

**TEST FOR CUT-OUTS AND FILLING**

**B-1 PROCEDURE**

Type five sets of lines each having e, 0 and 8 on the stencil paper with a suitable type-writer properly spaced so as to cover the whole stencil. The stencil paper shall be considered satisfactory if the impressions are clear and distinct without any evidence of cut-outs and tendency of filling up of the letters before as well as after the test is made on a duplicating machine.

**ANNEX C**

(*Clause* 4.11)

**TEST FOR RESISTANCE TO MOISTURE**

**C-1 PROCEDURE**

Cut a test piece of size 10 cm × 10 cm of stencil paper with backing sheet. Put a drop of distilled water (*see* IS 1070) on the backing sheet (in between the stencil and backing sheet) and place it between two glass plates (10 cm × 10 cm × 0.6 cm). Put a weight of 1 kg on the upper glass plate and allow to stand for 5 min. Separate the stencil from the backing sheet with a steady pull. The stencil shall be considered to have satisfied the requirement of the test if it separates from the backing sheet without any indication of sticking or disintegration.

**ANNEX D**

(*Clause* 4.12)

**ACCELERATED AGEING TEST**

**D-1 PROCEDURE**

Cut a 3 cm ×10 cm strip of stencil paper along with the backing sheet, and keep it between two pieces of flat glass plates (3 cm × 10 cm × 0.6 cm) and put a weight of 1 kg on the upper glass plate. Keep the whole assembly for three hours inside a hot oven in which the temperature is maintained at (10 ± 5) ℃. At the end of three hours the stencil paper shall show no tendency to stick to backing sheet nor any evidence of brittleness. There shall be no appreciable change in the colour of the stencil paper when compared with the original unheated portion of the sample.

**ANNEX E**

(*Clause* 6)

**SAMPLING OF STENCIL PAPER**

**E-1 GENERAL PRECAUTIONS**

**E-1.1** Stencil sheets shall be taken out in a covered place.

**E-1.2** They shall be protected from abnormal exposure to heat and light and shall not be allowed to come in contact with any fluid.

**E-1.3** Samples shall be handled as little as possible and contact with sweated hands shall be avoided.

**E-1.4** Tests for strength characteristics shall not be carried out with portions bearing water marks, creases or any visible imperfections.

**E-2 SCALE OF SAMPLING**

**E-2.1 Lot**

All the packets in a single consignment containing stencil papers of the same size, type and from the same batch of manufacture shall constitute a lot.

**E-2.1.1** Samples shall be tested from each lot separately for ascertaining conformity of the lot to the requirements of this specification.

**E-2.2** The number of packets to be selected ~from a lot for sampling shall depend upon the size of the lot and shall be in accordance with col (1) and (2)of Table 1.

**E-2.3** These packets shall be selected at random from the lot. In order to ensure randomness of selection, reference may be made to IS 4905. In case this standard is not readily available, the following procedure may be adopted.

Starting from any packet in the lot, count them in one order as 1, 2, 3,........,, up to *r* and so on where *r* is the integral part of *N/n* (*N* being the number of packets in the lot and it the number of packets to be selected). Every *rt*h packet thus counted shall be withdrawn till the required number of packets is obtained.

**E-2.4** From each of the packets selected according to **E-2.3** four stencil sheets shall be selected at random so as to give the total number of sheets in accordance with co1 (3**)** of Table 1.

**E-3 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY**

**E-3.1 Visual and Dimensional Characteristics**

**E-3.1.1** All the packets selected from a lot according to **E-2.3** shal1 be opened and examined for proper provisions of backing sheets and interleaving sheets. All the stencil papers shall he examined for odour (see **4.1.2),** transparency (*see* **4.1.3**), and quality of backing sheet (*see* **4.13**) and for sizes (*see* **4.15**). Any sheet failing in respect of one or more characteristics shall be termed defective.

**E-3.1.2** In respect of these characteristics a lot shall be considered to satisfy the requirements of the specification if the number of defective sheets found under **E-3.1.1** is not more than the corresponding permissible number of defective sheets given in co1 (4) of Table 1.

**E-3.2 Strength, Quality of Cutting, Legibility and Use with Stylus**

**E-3.2.1** The lot which has been found satisfactory under **E-3.1** shall then he tested for tensile strength, cut-out and filling, use with stylus, legibility and bursting strength.

**E-3.2.2** The number of tests to be conducted for each of these characteristics depends on the lot size and shall be as given in co1 (5) of Table 1. For this purpose, sufficient number of sheets shall be withdrawn from the sample selected under **E.2.4** and these sheets shall be subjected to tests for elongation, tensile strength, bursting factor, cut-outs and filling, use with stylus and legibility.

**E-3.2.3** A lot shall be declared as conforming to the requirements of the characteristics mentioned above, if for each of the characteristics, all the tests individually satisfy the corresponding requirements.

**E-3.3 Performance, Mass of Coating and Moisture Resistance**

**E-3.3.1** A lot which has been found satisfactory under **E-3.1** and **E-3.2** shall then be tested for performance, mass of coating and moisture resistance. For this purpose, one test shall be conducted for each of the characteristics If the lot size is 300 and below, and two tests in other cases. A sub-sample of stencil sheets required for these tests shall be taken from among those selected under **E-3.1**.

**E-3.3.2** A lot shall be deemed to have satisfied the requirements for these characteristics if for each of the characteristics al1 the test results individually satisfy the corresponding requirements.

**Table 1 Number of Packets and Sheets to be Selected -and Permissible Number of Defectives**

(*Clauses* E-2.2, E-2.3, E-2.4, 3.1.2 A *and* E-3.2.2)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SI No.** | **No of Packets in the Lot** | **For Examining Odour Transparency, Backing Sheets and Sizes** | | | **No of Tests for Elongation Tensile Strength, Bursting Strength, Cut-out and Filling Use with Stylus and Legibility** |
|  |  | No. of Packets  to be Selected | Total No. of Sheets to be Selected | Permissible No of Defective sheets |
|  | *N* | *n* |  |  |  |
| (1) | (2) | (3) | (4) | (5) | (6) |
|  | Up to 25 | 3 | 12 | 1 | 1 |
|  | 26 to l00 | 5 | 20 | 2 | 2 |
|  | 101 to 150 | 8 | 32 | 3 | 3 |
|  | 151 to 300 | 13 | 52 | 5 | 5 |
|  | 301 and above | 20 | 80 | 7 | 8 |

**E-3.4** A lot which has satisfied all the criteria given in **E-3.1**, **E-3.2** and **E-3.3** shall then be tested for keeping quality. For this purpose, one packet shall be chosen from the sample selected under **E-2.3**. The lot shall be declared as conforming to the requirements for keeping quality if the packets passes the corresponding test.

**ANNEX F**

(*Foreword*)

**COMMITTEE COMPOSITION**

| *Organization* | *Representative(s)* |
| --- | --- |
| Goverment Printing West Bengal, Kolkata | Shri Subir Kumar Mandal **(Chairperson)** |
| All India Federation of Master Printers, New Delhi | Shri Harjinder Singh |
| All India Printing Ink Mfgrs Association Ltd, Mumbai | Shri Shivram Angne  Shri R. Sridharan (Alternate) |
| All India Print-Tech Professionals Forum, Kolkata | Shri Partha Pratim Sanyal |
| Consumer Voice, New Delhi | Shri Mau Khan  Dr Rajiv Jha (Alternate) |
| Department of Post, Ministry of Communication,  New Delhi | Shri S. Buchchan  Dr Amarpreet Duggal (Alternate) |
| Directorate of Printing, New Delhi | Shri D. K. Jain  Shri K. K. Puri (Alternate) |
| DIC India Limited, Noida | Dr Kamakshi Christopher  Shri Vivek Tiwari (Alternate) |
| Flint Group, Noida | Shri Kamlesh Ganatra  Shri Dinesh Ahuja (Alternate) |
| Government of Indian Stationery Office, Kolkata | Shri Bishamber Dhar  Shri Rakesh Kumar Sukul (Alternate) |
| Hi-Tech Inks Private Limited, Mumbai | Shri Anil Rastogi  Shri Vipin Chaudhry (Alternate) |
| Hubergroup India Pvt Ltd, Vapi | Shri Amit Dammani  Shri Prasanta Sarkar (Alternate) |
| Indian Institute of Packaging, New Delhi | Dr Tanweer Alam  Shri Bidhan Das (Alternate) |
| Kokuyo Camlin Limited, Mumbai | Shri Manik J. Salunkhe  Shrimati Sayali Suraj Sarfare (Alternate) |
| Kumarappa Handmade Paper, Jaipur | Dr Saakshy Agarwal |
| National Archives of India, New Delhi | Shri Ram Swaroop  Dr Sutapa Chakravarty (Alternate) |
| National Test House, Ghaziabad | Shri Buddh Prakash |
| Sakata Inx (India) Ltd, New Delhi | Shri Vijay Shankar Gupta  Shri Sunil K. Chhabra (Alternate) |
| Security Printing and Minting Corporation of India  Limited, New Delhi | Shri S. Mahapatra  Dr D. K. Rath (Alternate) |
| Shriram Institute for Industrial Research, Delhi | Dr Manmohan Kumar  Dr Vinay Tyagi (Alternate) |
| Siegwerk Inks, Bhiwadi | Shri Umesh Bhende  Ms Benita Paul (Alternate) |
| SICPA India Ltd, New Delhi | Dr Praveen Kumar Yadav |
| The Regional Institute of Printing Technology, Kolkata | Shri Shankhya Debnath  Shri Krishnendu Halder (Alternate) |
| Times Group, Delhi | Shri Snehasis Roy  Shri Anup Kumar Pal (Alternate) |
| Toyo Ink India Pvt Ltd, Gautam Budh Nagar | Shri Vivek Rastogi  Shri Sanjeev Kumar (Alternate) |
| Western Printing Group, Survey of India, Delhi | Shri Equerar Ahmad |
| Whale Stationery Products Ltd, Delhi | Shri Mukesh Gupta  Shri Aseem Gupta (Alternate) |
| Yansefu Inks and Coating Pvt Ltd, Gurugram | Shri Neelakamal Mohapatra  Shri Angshuman Mukherjee (Alternate) |
| BIS Directorate General | Shri A. K. Lal, Scientist ‘F’/Senior Director and Head (Chemical) [Representing Director General (Ex-officio)] |

*Member Secretary*

Shri Sagar Singh

Scientist ‘D’/Joint Director

(Chemical), BIS