

<p>भारतीय मानक मसौदा</p> <p>जल आधारित रिकॉर्डर स्याही — विशिष्टि</p> <p><i>(IS 8277 का पहला पुनरीक्षण)</i></p> <p><i>Draft Indian Standard</i></p> <p>Water Based Recorder Inks — Specification</p> <p><i>(First Revision of IS 8277)</i></p> <p><i>(Not to be reproduced without the permission of BIS or used as an Indian Standard)</i></p> <p>ICS 87.080</p>	
Printing Inks, Stationery and Allied Products Sectional Committee, CHD 14	Last date of comments: 01.07.2024

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FOREWORD

(Formal clause will be added later)

This standard was originally published in 1976. In this revision, reference clause has been incorporated. Also, Packing and Marking clause has been updated. The standard has been updated based on the technological advancements that may have taken place since the last publication of the Standard.

Recorder inks are used with automatic instrument recorders, in which a trace is drawn on a moving sheet of paper. Since the quality of a record depends on the paper as well as on the ink, it is necessary to use paper of the right quality. The specification for paper is covered under IS 5947.

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.

*Draft Indian Standard***WATER BASED RECORDER INKS — SPECIFICATION***(First Revision)***1 SCOPE**

1.1 This standard prescribes the requirements and the methods of sampling and test for water based inks used in automatic single point and multipoint instrument recorders for marking permanent continuous/ intermittent trace on a sheet or long roll of paper.

1.1.1 It does not cover inks for use with recorders where ball pen and dot marks are used.

2 REFERENCES

The standards listed below contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
IS 1070 : 2023	Reagent grade water — Specification (<i>fourth revision</i>)
IS 4395 : 1987	Glossary of terms relating to inks and allied industry (<i>first revision</i>)
IS 4905 : 2015	Random sampling and randomization procedures (<i>first revision</i>)
ISO 24153 : 2009	
IS 5947 : 1970	Charts for recording meteorological instruments

3 TERMINOLOGY

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

4 TYPES

The ink shall be of the following two types:

- a) Slow drying, and
- b) Quick drying.

5 COLOUR

The ink shall be of any of the following colours:

Violet, Blue, Green, Yellow, Red, Brown and Black.

6 REQUIREMENTS**6.1 Description**

6.1.1 The ink shall draw a neat, legible and permanent (*see 6.4*) mark on paper, without smudging or reacting with the paper.

6.1.2 It shall have good marking qualities including free flow from-the marking instrument without flooding or clogging the tip under different temperature and humidity conditions ranging from -20 °C to +65 °C and 0 to 100 percent relative humidity.

6.1.3 It shall be inert to the marking instrument and shall have no pronounced odour.

6.2 Intensity of Colour

The intensity of colour shall be at least equal to the reference ink prepared by dissolving the following dyes as prescribed in 6.2.1. The comparison shall be made visually in Nessler cylinders after 1: 100 dilution:

SI No.	Colour of Ink	Name of Dye	Hue No.	Colour Index* No.
(1)	(2)	(3)	(4)	(5)
i)	Violet	Direct violet N	Direct violet 1	22 570
ii)	Blue	Direct sky blue	Direct blue 1	24 410
iii)		Direct sky blue	Direct blue 15	24 400
iv)		Direct blue	Direct blue 3	23 705
v)	Green	Direct dark green	Direct green 1	30 280
vi)		Direct green B	Direct green 6	30 295
vii)	Yellow	Direct fast yellow	Direct yellow 28	19 555
viii)	Red	Direct fast scarlet	Direct red 24	29 185
ix)		Congo red	Direct red 28	22 120
x)	Brown	Direct dark brown	Direct brown 26	31 370
xi)	Black	Direct black	Direct black 38	30 235

NOTE — The dyes shall be essentially free from diluents and impurities.

* Colour Index as published and updated from time to time by Society of Dyers and Colourists, U.K. and American Association of textile chemists and colourists.

6.2.1 Reference ink for slow drying type shall be made by dissolving 10 g of the appropriate dye specified in 6.2 in 1 000 ml of a mixture of equal volumes of glycerin (glycerol) and distilled water (*see* IS 1070). Reference ink for quick drying type shall be made by dissolving the same quantity of dye in 1 000 ml of a mixture of one volume of glycerin (glycerol) and three volumes of distilled water.

6.3 Marking Quality

The ink shall pass the marking test prescribed in **A-1**.

6.4 Permanence

The marking obtained with the ink as in **A-1** when subjected to the daylight exposure and ultraviolet ray exposure as prescribed in **A-2** shall not fade more than the markings obtained with the reference ink in the same manner.

6.5 Stability

The ink shall pass the requirements of the test prescribed in **A-3**.

6.6 Homogeneity

The ink shall pass the test prescribed in **A-4**.

7 KEEPING QUALITY

The ink shall continue to satisfy the requirements prescribed in 6 for a minimum period of 24 months from the date of packing when stored in air-tight containers and kept at ambient room temperature.

8 PACKING AND MARKING

8.1 Packing

8.1.1 The ink shall be packed in suitable glass or plastics containers of 25 ml, 50 ml and 100 ml capacity or of 500 ml capacity, if desired.

8.1.2 The containers shall be closed tightly with leak-proof cork or plastics screw caps such that when tilted or shaken no trace of ink flows out of the bottle.

8.1.3 Each container shall be accompanied by a suitable small ink dropper with which the marking instrument or ink reservoir can be filled conveniently.

8.1.4 Ten each of the 25 ml, 50 ml, or 100 ml containers shall be packed in a cardboard carton provided with suitable partitions. Each 500 ml bottle shall be separately packed in a cardboard carton.

8.2 Marking

Each container and cardboard carton shall have a neat label containing the following information:

- a) Name, type and colour of the material;
- b) Volume in ml in the container;
- c) Manufacturer's name and/or his recognized trade-mark, if any;
- d) Identification in code or otherwise to enable the batch and date of manufacture to be traced back from records;
and
- e) Month and year of packing.

8.2.1 *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 there under, and the products may be marked with the Standard Mark.

9 SAMPLING

The method of drawing representative samples of the material from a lot, number of tests to be performed and the criteria of finding the conformity of the material of the requirements of this specification shall be as prescribed in Annex B.

ANNEX A

(Clauses 6.3 to 6.6)

METHODS OF TEST FOR WATER BASED RECORDER INKS

A-1 TEST FOR MARKING QUALITY

A-1.1 Procedure

Before the test, the ink reservoir of the recorder shall be properly washed with spirit or water and the marking instrument shall be cleaned with spirit to remove grease. The reservoir shall be filled with the reference ink (*see 6.2.1*) and the sample ink at least twice and emptied. The test shall be carried out on the same chart for recording meteorological instruments (*see IS 5947*) at about the same temperature.

A-1.1.1 With the reservoir filled with the ink, continuously write about ten lines on the chart paper. The marking instrument pressure on the paper shall be normal and the width or the marking point shall not exceed 0.5 mm. The ink shall be considered to have passed the test if it satisfies the following conditions:

- a) During the writing there is no excessive flow of the ink from the stylus as indicated by drops or smudges;
- b) The lines drawn with the sample ink match those with the reference ink visually in all respects;
- c) After one hour in case of slow drying ink, and 10 s to 50 s in case of quick drying ink, when a blotting paper is placed on the test paper no impression is transferred on to the blotting paper;
- d) The ink retains the flow after 24 h from the time of filling; and
- e) If the tip is kept on the chart stationary for 24 h, the ink shall not smudge on the chart, on restarting the chart drive the ink flow shall be maintained automatically.

A-2 TEST FOR PERMANENCE

A-2.1 Daylight Exposure

A-2.1.1 Procedure

Dry the stripe obtained in **A-1.1** for 15 min. Cut the paper into strips, each 5 cm wide and at right angles to the marking. Expose the markings for 8 days to air and diffused daylight in the shade. At the same time and under the same conditions, perform the experiment with the reference ink (*see 6.2.1*).

A-2.1.1.1 The markings of the ink shall show a close match to those of the reference ink.

A-2.2 Ultra-Violet Ray Exposure

A-2.2.1 Procedure

Place the papers containing the markings from ink and the reference ink at a distance of 25 cm from an ultra-violet lamp (*see A-2.2.1.1*) normal to the rays, and expose for a total period of 36 h.

A-2.2.1.1 The ultraviolet lamp shall be of 125 W and of long wave UV region chiefly at 3 655 Å.

A-2.2.1.2 The darkness (intensity) of the markings from the ink shall be at least equal to that of the markings from the reference ink.

A-3 TEST FOR STABILITY

A-3.1 Apparatus

A-3.1.1 *Glass Beaker* — unlippped, 100 ml capacity.

A-3.2 Procedure

Take 50 ml of the ink in an unlippped beaker of 100 ml capacity. Mark the level of the liquid, cover it with a watch glass and leave for 15 days in a place uncontaminated by dust and chemical fumes. Examine for moulds and flakes after this period.

A-3.2.1 Make up the volume with water and stir. Allow to stand for 24 h and filter, the ink shall remain non-gelatinous and shall leave no residue on filtration.

A-4 TEST FOR HOMOGENEITY

A-4.1 Procedure

Shake the ink thoroughly. Withdraw 10 ml and transfer to a clean centrifuge tube. Centrifuge for 2 min at 1 500 rev/min. Remove the tube carefully without shaking and decant the liquid slowly.

A-4.1.1 The ink shall be considered to have passed the test if there is no sediment found in the tube.

ANNEX B

(Clause 9)

SAMPLING OF WATER BASED RECORDER INKS

B-1 GENERAL REQUIREMENTS OF SAMPLING

B-1.1 In drawing, preparing, storing and handling test samples the precautions and directions given in **B-1.2** to **B-1.5** shall be observed.

B-1.2 Samples shall be drawn from original unopened bottles.

B-1.3 Samples shall not be taken in an exposed place.

B-1.4 Unless otherwise stated in any test method, sample ink from each of the selected bottles shall be drawn after shaking and then allowing the fluid to come to rest.

B-1.5 Each of the sample containers shall be marked with full details of sampling and the month and year of the manufacture of the material.

B-2 SCALE OF SAMPLING

B-2.1 All the bottles in a single consignment of the material containing ink of the same type and colour shall be grouped together to form a lot.

B-2.2 Samples of the ink shall be tested from each lot separately for ascertaining the conformity of the material to the requirements of the specification.

B-2.3 The number of bottles (n) to be chosen from the lot (N) depends upon the size of the lot and shall be in accordance with Table 1.

B-2.4 These bottles shall be chosen at random from the lot. In order to ensure randomness of selection some random number table may be used. For guidance to random selection procedures, reference may be made to IS 4905.

Table 1 Number of Bottles to be Selected for Sampling

(Clause B-2.3)

Lot Size	No. of Bottles to be Chosen
(N)	(n)
(1)	(2)
Up to 25	3
26 to 50	4
51 to 100	5

101 to 300	7
301 to 500	9
501 and above	12

B-3 NUMBER OF TESTS

For testing for all the requirements prescribed in **6.1** to **6.6**, a composite sample shall be prepared by mixing equal volume (about 40 ml) of ink from each of the selected bottles. From this composite sample, required quantity of ink shall be drawn for conducting various tests.

B-4 CRITERIA FOR CONFORMITY

The lot shall be declared to have complied with the requirements of the specification if the composite sample **B-3** passes the relevant tests.