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IS 13299 (1992): Balls for Ball Point Pen Refills [CHD 14: Printing, Inks, Stationary and Allied Products]



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भारतीय मानक

बाल पाइंट पेन रिफिलों के लिए गोलियां – विशिष्ट

Indian Standard

**BALLS FOR BALL POINT PEN REFILLS —
SPECIFICATION**

UDC 686.863.76

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

FOREWORD

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

Balls in the refills of ball point pen are the most important constituent and as such, much of the performance of a ball point pen refill depends on how the ball responds to the demands of writing with respect to its shape, dimension and finish. This standard has been prepared with a view to assist the manufacturers of ball point refills in procuring quality balls.

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 : 1960 'Rules for rounding off numerical values (*revised*)'. 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

BALLS FOR BALL POINT PEN REFILLS — SPECIFICATION

1 SCOPE

This standard prescribes requirements and methods of sampling and test for balls used in refills of ball point pen. This standard does not cover balls made of ceramic or ruby.

2 REFERENCES

The Indian Standards listed below are necessary adjuncts to this standard:

IS No.	Title
1570 (Part 1) : 1972	Stainless and heat resisting steels: Part 1 (<i>first revision</i>)
1848 : 1981	Writing and printing papers (<i>second revision</i>)
2500 (Part 1) : 1973	Sampling inspection tables: Part 1 Inspection by attributes and by count of defects (<i>first revision</i>)
4905 : 1968	Methods for random sampling

3 MATERIAL

Stainless steel conforming to grade X 20 or Cr 13 of IS 1570 (Part 1) : 1972 or tungsten carbide or any non-corrosive metal.

4 DIMENSIONS

It shall be as given in Table 1.

5 WORKMANSHIP AND FINISH

The surface of the ball shall be finished smooth and when tested for smooth writing under normal pressure shall not scratch the paper or skip the writing. The ball shall be polished bright.

6 HEAT TREATMENT

The balls shall be uniformly hardened and tempered to a hardness of 650 HV to 750 HV.

7 TESTS

7.1 Ball Size

Remove the balls from the carton taking special care

to ensure that the balls are not marked, scratched or otherwise damaged. Clean the balls thoroughly with a suitable solvent and then condition them for 24 hours in an atmosphere having a temperature of $27 \pm 2^\circ\text{C}$.

7.1.1 Using a device, capable of measuring up to 0.000 5 mm, measure the diameter of each ball in three different positions at this temperature, ensuring that the ball is handled in a manner so as to prevent contact by hand and consequent variation in temperature. Record the mean diameter of each ball and the difference between the minimum and maximum diameter of all the balls.

7.2 Leakage

The refills containing the ball shall be suspended point down for 24 h. At the end of the test the refill shall show no evidence of ink leakage from the writing tip (ball leakage).

7.2.1 Smoothness of Writing

The refill passing the leakage test shall be used to draw 50 to 60 continuous loops on a sheet of white super-calendered printing paper (see IS 1848 : 1981) within a period of 15 seconds under normal pressure. The loops shall be continuous without excess deposit of ink and shall be uniform in colour. Writing shall be smooth and shall not scratch the paper.

NOTE — Before finally concluding that the leakage of the ink (excess deposit of ink and scratching of the paper) is due to defect in the ball, the ball should be tested in at least three nozzles from different lots using a standard ink.

8 PACKING AND MARKING

8.1 Packing

A suitable number of balls shall be put in a polyethylene bag and the bag shall be heat sealed. It shall then be packed in cartons in accordance with the current trade practices or as agreed to between the purchaser and the supplier.

8.2 Marking

Each carton containing balls shall be legibly and

Table 1 Dimensions of Balls for Ball Point Refills
(Clause 4)

Dimensions	Size of Ball					
	Extra Fine	Fine	Medium Fine	Medium	Broad	
Mean diameter of ball (<i>d</i>)	<i>Min</i>	0.68	0.73	0.88	0.98	1.09
	<i>Max</i>	0.70	0.80	0.90	1.00	1.15
Difference between minimum and maximum diameter of balls in any one lot, <i>Max</i>	0.000 3	0.003	0.003	0.003	0.003	0.003

indelibly marked on the outside with the following information:

- a) Indication of the source of manufacture,
- b) Material of the ball,
- c) Ball size, in mm,
- d) Number of balls in the carton, and
- e) Batch number.

8.2.1 The cartons containing balls may also be marked with the Standard Mark of the Bureau.

9 SAMPLING

Representative samples of the product shall be drawn as prescribed in Annex A.

ANNEX A

(Clause 7)

SAMPLING OF BALLS FOR BALL POINT REFILLS

A-1 Unless otherwise agreed to between the purchaser and the supplier, the procedure as given in IS 2500 (Part 1) : 1973 shall be followed for sampling and inspection.

A-2 LOTS

The fibre-tip markers of the same size and the material, and produced under similar conditions of manufacture shall constitute a lot.

A-3 SAMPLING

For various characteristics, the sampling plan as given in 3.1, 3.2 and 3.3 shall be followed. However, the samples shall be drawn randomly for testing various requirements of this standard in accordance with IS 4905 : 1968.

A-3.1 For material as prescribed in 3, shapes and dimensions as prescribed in 4, workmanship and finish

as prescribed in 5, and hardness as prescribed in 6, the single sampling plan with Inspection Level III and Acceptable Quality Level (AQL) 4 percent as given in Table 1 and Table 2 of IS 2500 (Part 1) : 1973 shall be followed.

A-3.2 For ball size as prescribed in 7.1, leakage test as prescribed in 7.2, and smoothness of writing as prescribed in 7.2.1, the single sampling plan with Inspection Level III and Acceptable Quality Level (AQL) 2.5 percent as given in Table 1 and Table 2 of IS 2500 (Part 1) : 1973 shall be followed.

A-4 CRITERIA FOR CONFORMITY

For the lot to be accepted as conforming to the requirements of this standard, the total number of defectives found in each of the sample shall be less than or equal to the corresponding acceptance number (a) given in Table 2 of IS 2500 (Part 1) : 1973.

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard 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 which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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