

भारतीय मानक

विद्युत लेपन के लिए चांदी के एनोड — विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

**SILVER ANODES FOR ELECTROPLATING —
SPECIFICATION**

(Second Revision)

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BUREAU OF INDIAN STANDARDS
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FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Metallic and Non-metallic Finishes Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first published in 1961 and subsequently revised in 1983. The Committee has felt the need to revise the standard again. In this revision various clauses of this standard has been modified as per international practice.

In the preparation of this standard, assistance has been derived from corresponding BS 1561 : 1966 'Silver anodes and silver salts for electroplating', issued by the British Standards Institution.

This standard is intended chiefly to cover the technical provisions relating to silver anodes for electroplating, and it does not include all the necessary provisions of a contract.

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 values should be the same as that of the specified value in this standard.

Indian Standard

SILVER ANODES FOR ELECTROPLATING — SPECIFICATION

(*Second Revision*)

1 SCOPE

This specification covers the requirements of pure silver anodes used for electroplating.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	Title
1387 : 1993	General requirements for the supply of metallurgical materials (<i>second revision</i>)
1501 (Part 1) : 1984	Method for vickers hardness test for metallic materials, Part 1 (<i>second revision</i>)
1953 : 1973	Method of the chemical analysis of silver anodes (<i>first revision</i>)
2113 : 1972	Methods for assaying of silver in silver and silver alloys (<i>first revision</i>)

3 SUPPLY OF MATERIAL

General requirements relating to supply of silver anodes shall be as laid down in IS 1387 : 1993.

4 CHEMICAL COMPOSITION

4.1 The chemical analysis of silver anodes when carried out by the method specified in IS 1953 : 1963 and IS 2113 : 1972 shall be as given in Table 1. When required impurities shall be determined by a method agreed to between the purchaser and the manufacturer.

Table 1 Chemical Composition, Percent
(*Clause 4.1*)

Sl No.	Element	Requirements
i)	Silver	Not less than 99.95
ii)	Silver and copper	Not less than 99.98
iii)	Total of impurities such as Au, Pt, Pb, Bi, Fe, Zn, S, Se & Te	Not to exceed 0.02

4.2 Special silver anodes required for high conductivity applications may be procured based on chemical composition as agreed to between the purchaser and the manufacturer.

5 HARDNESS

The hardness of the silver anodes shall not exceed 40 HV 5 when tested in accordance with IS 1501 (Part 1) : 1984.

6 SHAPE AND SIZE

Silver anodes for electroplating shall, unless otherwise specified by the purchaser, be cast, rolled or extruded and in the annealed condition. Dimensions of anodes shall be as agreed to between the purchaser and the supplier.

7 FREEDOM FROM DEFECTS

Anodes shall be clean, substantially free from cracks, warps, inclusions, porosity, sponginess, ragged edges, surface films and any other harmful defects which may adversely effect its uniform dissolution while in use.

8 PACKING

Unless otherwise specified, anodes shall be separated accordingly to their sizes and shall be packed in such a manner as to ensure safe transportation to the point of delivery. Wherever practicable, one size of anodes shall be packed in a single container.

9 SAMPLING

The method of drawing representative samples of the Silver Anodes and the criteria for conformity shall be as prescribed in Annex A.

10 MARKING

The anodes shall be marked legibly and indelibly with the name, initials or trade-mark of the manufacturer. In case of anodes with hooks, the name, initials or trade-mark of the manufacturer shall be placed near the hook.

ANNEX A (Clause 9)

SAMPLING

A-1 LOT

A-1.1 In any consignment, all the silver anodes manufactured under similar conditions of production shall be grouped together to constitute a lot.

A-2 SCALE OF SAMPLING

A-2.1 The number of anodes to be selected at random from the lot shall depend upon its size and shall be as given below:

No. of Anodes in the Lot	No. of Anodes to be Selected
Up to 25	2
26 to 50	3
51 to 100	4
101 to 200	5
201 to 300	7
301 and above	10

A-3 DRILLINGS

A-3.1 From each anodes selected as in A-2.1, drillings shall be obtained from not less than three widely spaced position and weighing not less than 20 g. The drillings from each anode shall be stored separately. These drillings shall be obtained in the manner specified in A-3.2.

A-3.2 Select a sharpened twist drill (6 to 10 mm drill should be suitable). Thoroughly clean the drill in light petroleum and wipe clean with

muslin. Free the anodes from any loose impurity by means of a steel wire brush. Bore the holes to approx 10 percent of the thickness of anodes and discard the drillings therefrom. Place the anodes on the cleaned tinned iron sheet and drill a further 80 percent of the thickness. Collect the drillings thus obtained and transfer to a clean container. If a larger quantity of drillings is required more holes may be drilled as described above. Before analyzing, the drillings should be washed in light petroleum.

A-4 TESTS

A-4.1 The drillings from each anodes should be separately tested for silver content (*see 4.1*) and combined silver and copper content (*see 4.1*).

A-5 CRITERION FOR CONFORMITY

A-5.1 From the test results for silver content and for combined silver and copper content, the average and the range shall be calculated and the lot shall be considered as conforming to the requirements of this specification, if the following conditions are satisfied:

- a) For silver content (average — 0.6 range) shall be greater than or equal to 99.95 percent; and
- b) For combined silver and copper content (average — 0.6 range) shall be greater than or equal to 99.98 percent.

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