भारतीय मानक

IS 2605 : 2023

Indian Standard

विद्युतलेपन के लिए जिंक एनोड्स — विशिष्टि

(दूसरा पुनरीक्षण)

Zinc Anodes for Electroplating — Specification

(Second Revision)

ICS 77.120.60

भारतीय मानक ब्यूरो
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Ores and Feed Stock for Non-Ferrous (Excluding Aluminium and Copper) Industry, their Metals/Alloys and Products Sectional Committee, MTD 09

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Ores and Feed Stock for Non-Ferrous (Excluding Aluminium and Copper) Industry, their Metals/Alloys and Products Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard first published in 1964 and subsequently revised in 1985. The first revision was prepared keeping in view the latest developments in the field of electroplating and included one more grade, on the basis of the nature of the bath. As a result of experience gained during the following years, it has been decided to revise the standard and the following modifications have been done with respect to previous version:

a) Reference clause has been added;
b) The chemical composition clause has been modified to include the new instrumental test methods and any other methods as agreed between purchaser and manufacturer;
c) Chemical composition of Grade I has been modified especially with respect to copper and iron content; and
d) Marking clause has been modified incorporating the new provisions of *Bureau of Indian Standards Act*, 2016.

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

For the purpose of deciding whether a particular requirements 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 value (*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

ZINC ANODES FOR ELECTROPLATING — SPECIFICATION

(Second Revision)

1 SCOPE

This standard covers the requirements for zinc anodes used in electroplating.

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 406 : 1964	Methods of chemical analysis of slab zinc (spelter) (*revised*)
IS 1387 : 1993	General requirements for the supply of metallurgical materials (*second revision*)
IS 2600 (all parts)	Methods of chemical analysis of high purity zinc and zinc base alloys for die castings

3 SUPPLY OF MATERIALS

General requirements relating to the supply of zinc anodes shall conform to IS 1387.

4 CHEMICAL COMPOSITION

The chemical composition of zinc anodes shall conform to the requirements as given in Table 1, when determined in accordance with IS 406, or IS 2600 and its relevant parts, or any other established instrumental/chemical method. In case of dispute, the procedure given in IS 406 shall be the referee method. However, when the method is not given in IS 406, the referee method shall be as agreed between the purchaser and the manufacturer.

5 SHAPE AND SIZE

Zinc anodes shall be supplied in cast (preferably chill cast), rolled or extruded form or about 12 mm diameter balls, as specified by the purchaser and of suitable shape and dimensions as agreed to between the manufacturer and the purchaser.

6 FREEDOM FROM DEFECTS

Anodes shall be clean, substantially free from cracks, wraps, inclusions, porosity, ragged edges, surface film such as rolling skin, and other defects which may adversely affect uniform dissolution while in use.

7 SAMPLING

Sampling of zinc anodes for chemical analysis shall be as agreed to between the manufacturer and the purchaser. A recommended sampling procedure for criterion for conformity is given in Annex A.

8 MARKING AND PACKAGING

8.1 Anodes shall be marked with grade, name, initials or trade-mark of the manufacturer. However, in case of anodes with hooks these markings shall be placed near the hooks.

8.2 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 product(s) may be marked with the Standard Mark.

8.3 Packing

Unless otherwise specified anodes shall be separated according 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.

Table 1 Chemical Composition of Zinc Anodes

(*Clause* 4)

Sl No.	Elements	Limit of Elements in Weight Percent	
		Grade I	Grade II
(1)	(2)	(3)	(4)
i)	Zn, *Min*	99.98	99.95
ii)	Pb, *Max*	0.003	0.01
iii)	Hg, *Max*	0.004	0.005
iv)	Cd, *Max*	0.003	0.02
v)	Fe, *Max*	0.001	—[1]
vi)	Cu, *Max*	0.002	0.005
vii)	Others[2], *Max*	0.007	< 0.001

[1] Total Fe + Sn content shall not exceed 0.01 percent.

[2] Unless otherwise agreed between the purchaser and manufacturer or stated in the enquiry/order, the other impurity elements shall be at the discretion of the manufacturer and shall be declared by the manufacturer subject to the maximum limit on the total amount of other impurity elements given in the table.

ANNEX A

(*Clause* 7)

SAMPLING PROCEDURE FOR ZINC ANODES FOR ELECTROPLATING

A-l LOT

In any consignment, all the zinc anodes of the same type and manufactured under similar conditions of production shall be grouped together to constitute a lot.

A-2 SCALE OF SAMPLING

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

Sl No.	*No. of Anodes in the Lot*	*No. of Anodes to be Selected*
(1)	(2)	(3)
i)	Up to 25	2
ii)	26 to 50	3
iii)	51 to 100	4
iv)	101 to 200	5
v)	201 to 300	7
vi)	301 and above	10

A-3 DRILLINGS

A-3.1 From each of the anodes selected in **A-2**, drillings shall be obtained from not fewer than three widely-spaced positions. These drillings shall be obtained as specified in **A-3.2** and drillings from each anode shall be stored separately.

A-3.2 Select a sharpened twist drill (6 mm to 10 mm drill should be suitable). Thoroughly clean the drill in light petroleum and wipe clean with muslin. Free the anode from any loose impurity by means of a steel wire brush. Bore the holes to approximately 10 percent of the thickness of the anode and discard the drillings therefrom. Place the anode on a clean 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 analysing, the drillings shall be washed in light petroleum.

A-4 NUMBER OF TESTS

The drillings from each anode selected in accordance with **A-2** shall be separately tested for requirements mentioned in **4**.

A-5 CRITERION FOR CONFORMITY

From the test results, the average and the range shall be calculated for each of the characteristics, and the lot shall be considered as conforming to the requirements of this specification if the conditions mentioned below are satisfied for each characteristic:

a) If the maximum limit is specified, then [average + (0.6 × range)] shall be less than or equal to the limit specified; and

b) If the minimum limit is specified, then [average – (0.6 × range)] shall be greater than or equal to the limit specified.

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Ores and Feed Stock for Non-Ferrous (Excluding Aluminium and Copper) Industry, their Metals/Alloys and Products Sectional Committee, MTD 09

Organization	*Representative(s)*
Directorate General Quality Assurance, Katni	SHRI P. MEENA **(*Chairperson*)**
Arya Alloys Private Limited, New Delhi	SHRI AMRENDRA K. JHA
Bhabha Atomic Research Centre, Mumbai	DR DHRUVA KUMAR SINGH DR BHASKAR PAUL (*Alternate*)
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CSIR - National Metallurgical Laboratory, Jamshedpur	DR ABHILASH DR PRATIMA MESHRAM (*Alternate*)
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Organization	*Representative(s)*
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The Tinplate Company of India Limited, Jamshedpur	DR SOURAJYOTI DEY SHRI SUBRATA SADHU (*Alternate*)
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Member Secretary
SHRI SAAQIB RAAHI
SCIENTIST 'B'/ASSISTANT DIRECTOR
(METALLURGICAL ENGINEERING), BIS

Bureau of Indian Standards

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