

Specification for

Tin anodes and tin salts for electroplating

Confirmed
May 2009

Co-operating organizations

The Surface Coatings (other than Paints) Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

- Aluminium Federation
- Assay Offices Committee of Great Britain
- Association of Metal Sprayers
- British Bolt, Nut, Screw and Rivet Federation
- British Cycle and Motor Cycle Industries Association Limited*
- British Electrical and Allied Manufacturers' Association
- British Iron and Steel Federation
- British Jewellers' Association
- British Non-ferrous Metal Research Association*
- Chemical Industries Association*
- Electricity Council, the Central Electricity Generating Board and the Area Boards in England and Wales
- Electronic Engineering Association
- Engineering Equipment Users' Association
- Institute of Metal Finishing*
- Institute of Sheet Metal Engineers
- Institute of Vitreous Enamellers
- Greater London Council
- Metal Finishing Association*
- Ministry of Aviation
- Ministry of Defence, Army Department
- Ministry of Defence, Navy Department
- Society of Motor Manufacturers and Traders Limited*
- Tin Research Institute*
- Vitreous Enamel Development Council
- Zinc Development Association*

The scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

This British Standard, having been approved by the Surface Coatings (other than paints) Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council on 14 March 1967

- British Federation of Master Printers
- British Sulphate of Copper Association
- Chemical Society
- Institution of Chemical Engineers
- Royal Institute of Chemistry
- Scientific Instrument Manufacturers Association
- Society of Chemical Industry
- United Kingdom Cutlery and Silverware Manufacturers Association
- Individual firms

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Foreword

This standard makes reference to the following British Standards:

BS 612, *Nessler cylinders*.

BS 3252, *Ingot tin*.

BS 3338, *Methods for the sampling and analysis of tin and tin alloys — Part 1: Sampling of ingot tin*.

BS 3978, *Water for laboratory use*.

This British Standard is one of a series of standards that has been prepared to meet the requirements of electroplaters, others in the series being:

BS 558, 564, *Nickel anodes and nickel salts for electroplating*.

BS 622, *Cyanides for electroplating*.

BS 1561, *Silver anodes and silver salts for electroplating*.

BS 2656, *Zinc anodes, zinc cyanide and zinc oxide for electroplating*.

BS 2657, *Fluoroboric acid and metallic fluoroborates for electroplating*.

BS 2867, *Copper sulphate for electroplating*.

BS 2868, *Cadmium anodes and cadmium oxide for electroplating*.

BS 2884, *Copper cyanide for electroplating*.

Wherever appropriate, British Standard laboratory glassware should be used in the methods of test.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies requirements for tin anodes, stannous sulphate, sodium stannate and potassium stannate for electroplating.

2 Tin anodes

2.1 Physical form

Tin anodes shall be supplied in cast, rolled or extruded form as specified by the purchaser.

NOTE The attention of makers, dealers and users is directed to the fact that dirt and extraneous matter adhering to the anode surface is often detrimental to the working of a plating bath. Care should be taken, therefore, in transit and storage to keep anodes as clean as possible, but in any case they should be chemically cleaned before being put into use.

2.2 Chemical composition

2.2.1 Pure tin anodes. Tin anodes shall comply with the requirements for refined tin, Grade T2 of BS 3252¹⁾.

2.2.2 Alloy tin anodes. Certain elements are sometimes added to tin for anodes to improve the efficiency of anodic dissolution in alkaline tin plating baths.

These additions produce no deleterious effects on the baths and are not co-deposited with the tin. The tin used for the production of these anodes shall comply with the requirements for refined tin, Grade T2 of BS 3252¹⁾.

2.3 Sampling

For the purposes of examination under this standard, a representative sample shall be taken in accordance with the procedure described in BS 3338-1²⁾.

3 Stannous sulphate

3.1 Physical form and appearance

Stannous sulphate shall usually be of a pale cream crystalline structure and shall correspond to the formula SnSO_4 .

3.2 Chemical composition

Stannous sulphate shall contain not less than 50 % of stannous tin (equivalent to 90.4 % of stannous sulphate) and not more than 2 % of free sulphuric acid when determined by the methods given in Appendix B and Appendix F.

NOTE Commercial stannous sulphate almost invariably contains some stannic sulphate. The minimum content of stannous tin specified automatically limits the maximum stannic sulphate content to a safe value.

3.3 Impurities

The following impurities if present shall not exceed the limits given when the impurities are determined by the method described in the appropriate appendix.

Impurity	% (max.)	Appendix
Insoluble matter	1.0	Appendix A
Chloride, expressed as Cl	0.5	Appendix C
Antimony, expressed as Sb	0.1	Appendix D
Arsenic, expressed as As	0.01	Appendix E

3.4 Packing

Stannous sulphate shall be packed in air-tight containers preferably having replaceable closures.

NOTE On keeping, especially if left exposed to the air, stannous sulphate undergoes hydrolysis and therefore cannot be packed in iron or steel containers. To prevent deterioration it should at all times be stored in air-tight containers.

3.5 Sampling and size of sample

A representative sample of the material, weighing not less than 250 g is necessary for the purpose of examination under this standard. The sample shall be taken from freshly-opened packages and shall be packed in a clean, dry and air-tight bottle and sealed.

¹⁾ BS 3252, "Ingot tin".

²⁾ BS 3338, "Methods for the sampling and analysis of tin and tin alloys", Part 1, "Sampling of ingot tin".