

Specification for

Electroplated coatings of tin

UDC 669.058.7:669.65:621.357.7

Confirmed May 2009

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Surface Coatings (other than Paints) Standards Committee (SRC/-) to Technical Committee SRC/3 upon which the following bodies were represented:

- British Metal Finishing Suppliers' Association
- British Telecommunications
- Electronic Components Industry Federation
- Electronic Engineering Association
- Institute of Metal Finishing
- International Tin Research Institute
- Metal Finishing Association
- Ministry of Defence
- Telecommunication Engineering and Manufacturing Association (TEMA)

This British Standard, having been prepared under the direction of the Surface Coatings (other than Paints) Standards Committee, was published under the authority of the Board of BSI and comes into effect on 29 February 1984

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First published July 1952
First revision May 1964
Second revision February 1984

The following BSI references relate to the work on this standard:
Committee reference SRC/3
Draft for comment 81/50223 DC

ISBN 0 580 13664 7

Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Definitions	1
3 Information to be supplied by the purchaser to the electroplater	1
4 Coating classification	2
5 Sampling	2
6 Heat treatment of steel	2
7 Undercoats	2
8 Coatings	2
Appendix A Guidance information	4
Appendix B Determination of undercoat thickness and coating thickness	5
Appendix C Adhesion tests	6
Appendix D Sulphur dioxide porosity test	6
Figure 1 — Cabinet with door	8
Figure 2 — Hooded cabinet	9
Table 1 — Service condition and related recommended coating thickness	5
Publications referred to	Inside back cover

Foreword

This British Standard has been prepared under the direction of the Surface Coatings (other than Paints) Standards Committee. It applies to coatings of tin applied by electroplating to fabricated articles of ferrous and non-ferrous metals to protect them from corrosion and to facilitate soldering.

It is a revision of the 1964 edition, which is withdrawn, the main changes from which are:

- a) inclusion, as an appendix, of guidance notes drawing the attention of the user to factors which should be taken into account when electroplating with tin;
- b) deletion of the post-electroplating heat treatment recommendations for relief of hydrogen embrittlement because tin is now known to be virtually impervious to hydrogen;
- c) rationalization of the coating thicknesses recommended for different service conditions.

The electroplating processes used are not identified because, if the requirements of the specified tests are met, any of them may be considered suitable. The qualities of suitable chemicals for use in the electroplating of tin are specified in BS 1468.

Attention is drawn to the legislative requirements for tin coatings used in the food industry set out, for example, in Statutory Instrument (1972) No. 1957. Grade T2 of BS 3338 is suitable for this purpose.

It is essential, when specifying to BS 1872, that the purchaser should state the classification code and the other information listed in 3.1 (and, if appropriate, 3.2). Merely to ask for the electroplating to be carried out to BS 1872 without this information is insufficient.

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 electroplated coatings of tin. The coatings may be dull or bright as electroplated, or may be flow-melted by fusion after electroplating.

These coatings are intended for use on ferrous and non-ferrous basis metals and also on printed wiring boards.

A classification scheme is included by which the nature of the basis metal and undercoat, if any, and the tin coating thickness can be defined.

This standard does not specify any requirements for the condition, finish or surface roughness of the basis material before electroplating (see **A.3**).

NOTE 1 Attention is drawn to BS 9760, which specifies capability approval procedure and rules for printed circuits of assessed quality.

The standard is not applicable to electroplating of:

- a) threaded components (see BS 3382-5);
- b) tin coated copper wire (see BS 4393);
- c) sheet, strip (see BS 2920) or wire in the unfabricated form, or of coil springs;
- d) steels with tensile strengths greater than 1 000 MPa because such steels require hydrogen embrittlement relief after plating (see clause 6).

This standard does not apply to coatings applied by other processes, e.g. autocatalytic, immersion or “electroless” processes.

NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this standard, the following definitions, together with those given for other terms in BS 5411-1, apply.

2.1 significant surface

the part of the article covered or to be covered by the coating and for which the coating is essential for serviceability and/or appearance

2.2 flow-melting

a process by which a coating is melted in order to impart desirable properties, such as brightness or improved solderability

NOTE 1 Less preferred terms applicable to this definition are “fusing”, “flow-brightening” and “reflowing”.

NOTE 2 See **A.6**.

3 Information to be supplied by the purchaser to the electroplater

3.1 Essential information. The following information shall be supplied by the purchaser to the electroplater:

- a) the number of this standard, i.e. BS 1872;
- b) the nature of the basis material;
- c) the classification code of the coating required (see clause 4);
- d) the significant surface of the article to be electroplated, indicated, for example, by drawings or by the provision of suitably marked samples;
- e) which method of adhesion testing from Appendix C is to be used (see **8.3**);
- f) the sampling procedure to be adopted (see clause 5);
- g) the positions where unavoidable contact marks and other defects are acceptable (see **8.1**);
- h) requirements, where they exist, regarding the purity of the coating.

3.2 Additional information. The following additional information may be required, and if so, shall be specified by the purchaser, if necessary in consultation with the electroplater:

- a) whether any heat treatment, with the exception of that specified in clause 6 for certain steels, is required before electroplating;
- b) whether, for coatings whose minimum thickness is 10 µm or greater, the porosity test of Appendix D is to be applied (see **8.4**), and if so:
 - 1) the type, number, shape and dimensions of the test specimens to be used and whether cut edges to test specimens are to be protected;
 - 2) the total exposed surface area of the specimen or specimens to be tested at one time, and the angle of inclination of flat test specimens, if other than that specified in **D.4**;
- c) whether solderability testing is required, and if so, the test methods and conditions to be applied (see **8.5**);
- d) undercoats:
 - 1) for a basis material of copper alloy, containing zinc as an alloying constituent, and where solderable properties are required, which method is to be used to determine the required undercoat thickness;
 - 2) whether an undercoat (or undercoats) is required for basis materials other than described in item d) 1) above, and if so:
 - i) its nature and minimum local thickness (see **A.3** and **A.4**);