

Specification for

Electroplated coatings of nickel & chromium

UDC 669.248.7+669.268.7

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW



Document Sharing Hub

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:

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

The Government department and 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:

Association of Builders' Hardware Manufacturers	Lighting Industry Federation Limited
British Lock and Latch Manufacturers' Association	Lloyds Register of Shipping
British Plastics Federation	National Brassfoundry Association
British Railways Board	Post Office
Institution of Chemical Engineers	Scientific Instrument Manufacturers' Association
Institution of Corrosion Technology	Spring Research Association
Institution of Engineering Inspection	Zinc Alloy Die Casters' Association
	Individual firms

This British Standard, having been approved by the Surface Coatings (other than Paints) Industry Standards Committee, was published under the authority of the Executive Board on 13 January 1970

© BSI 12-1998

First published, July, 1945
First revision, October, 1953
Second revision, November, 1959
Third revision, March, 1965
Fourth revision, January, 1970

The following BSI references relate to the work on this standard:
Committee reference SRE/2
Draft for comment 69/12352

ISBN 580 05964 2

Amendments issued since publication

Amd. No.	Date	Comments
963	May 1972	Indicated by a sideline in the margin

Contents

	Page
Co-operating organizations	Inside front cover
Foreword	ii
1 Scope	1
2 Significant surface	1
3 Appearance	1
4 Heat treatment for steel	1
5 Requirements for coatings of nickel plus chromium	2
6 Requirements for coatings of nickel without chromium	6
Appendix A Examples of service conditions for which the various service condition numbers are appropriate	7
Appendix B Determination of nickel and copper thickness	7
Appendix C Ductility test	7
Appendix D Determination of chromium thickness — coulometric method	7
Appendix E Determination of cracks and pores in chromium coatings	8
Appendix F File test for adhesion	8
Appendix G Quenching test for adhesion	8
Appendix H CASS test	9
Appendix J Corrodikote test	9
Appendix K Acetic salt test	10
Table 1 — Nickel plus chromium coatings on steel (or iron)	3
Table 2 — Copper plus nickel plus chromium coatings on steel (or iron)	4
Table 3 — Nickel plus chromium coatings on zinc alloy	4
Table 4 — Nickel plus chromium coatings on copper or copper alloy	5
Table 5 — Nickel plus chromium coatings on aluminium or aluminium alloy	5
Table 6 — Corrosion tests appropriate to each service condition number	5
Table 7 — Nickel coatings on steel (or iron)	6
Table 8 — Nickel coatings on zinc alloy	6
Table 9 — Nickel coatings on copper or copper alloy	6
Table 10 — Nickel coatings on aluminium or aluminium alloy	6

Foreword

In order to keep abreast of progress in the industries concerned, British Standards are subject to periodical review. Suggestions for improvements will be recorded and in due course brought to the notice of the committees charged with the revision of the standards to which they refer.

A complete list of British Standards, numbering over 9,000, fully indexed and with a note of the contents of each, will be found in the BSI Catalogue which may be purchased from BSI Sales Department. The Catalogue may be consulted in many public libraries and similar institutions.

This standard makes reference to the following British Standards:

BS 576, *Acetic acid*.

BS 872, *Abrasive papers and cloths (technical products)*.

BS 998, *Vacuum salt for butter and cheese making*.

BS 2870, *Rolled copper and copper alloys. Sheet, strip and foil*.

BS 3745, *Method for the evaluation of results of accelerated corrosion tests on metallic coatings*.

This revision of BS 1224, prepared under the authority of the Surface Coatings (other than Paints) Industry Standards Committee, incorporates the provisions of the three draft Recommendations¹⁾ of the International Organization for Standardization (ISO) which relate to electroplated coatings of nickel and chromium. As a result, the following fundamental changes to the designation of coatings complying with this standard have been made:

- 1) The service condition numbers (previously service grade numbers) are now in the reverse order so that the highest number relates to the most severe conditions.
- 2) The service condition numbers do not incorporate a letter designating the basis metal, as did the service grade numbers in the previous edition of the standard: the basis metal must be stated separately.
- 3) The classification number uses chemical symbols for the basis metal and coating metals.
- 4) Although not yet included in the draft ISO Recommendations, the use of micro-porous chromium coatings is now covered by this standard which thus recognizes four different types of chromium coating.

In this standard no account is taken of the condition of the basis metal before plating and agreement should be reached between the plater and the purchaser regarding the acceptable degree of roughness of the basis metal.

For a nickel plus chromium coating the purchaser should specify the basis metal and the service condition number denoting the severity of the conditions which the coating is required to withstand. It is not necessary to state the classification number of the coating, defined in terms of the nature, thickness and properties of the deposits it comprises, but the purchaser may include this if he wishes. The classification number should always be specified for nickel coatings without a chromium topcoat. **Merely to ask for plating to be carried out to BS 1224 without the above additional information is insufficient.**

For both nickel and chromium deposits, the minimum thickness requirements apply only to those portions of the significant surface that can be touched by a ball 20 mm in diameter.

¹⁾ At present:

ISO/DR 1456, "Electroplated coatings of nickel plus chromium".

ISO/DR 1457, "Electroplated coatings of copper plus nickel plus chromium on steel".

ISO/DR 1458, "Electroplated coatings of nickel".

Of the laboratory corrosion tests included in this standard for nickel plus chromium coatings only the acetic acid salt spray test is appropriate for all such coatings (with the exception of the thinnest coatings on copper or copper alloy), the duration of the test being varied according to the service condition number. For the highest quality coatings the shorter term CASS test may be used instead or, except on coated copper or copper alloy, the Corrodkote test.

Acceptance or rejection of an article subjected to corrosion tests is governed by the extent of basis metal corrosion. Surface deterioration of the coating itself will occur on some types of coating, and it is recommended that the extent to which this can be tolerated should be subject to agreement between the supplier and the purchaser.

NOTE Attention is drawn to certification facilities offered by BSI; see the back cover of this standard.

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 to iv, pages 1 to 10 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.

