

Australian Standard

**ELECTROPLATED COATINGS
OF CHROMIUM FOR
ENGINEERING APPLICATIONS**

The following scientific, industrial and governmental organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Aluminium Development Council
Australasian Institute of Metal Finishing
Australian Zinc Development Association
Bureau of Steel Manufacturers of Australia
Confederation of Australian Industry
Copper and Brass Information Centre
Department of Defence
Department of Productivity
Electricity Supply Association of Australia
Metal Trades Industry Association of Australia
Royal Australian Chemical Institute
Society of Automotive Engineers— Australasia
Telecom Australia
University of Queensland

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OF CHROMIUM FOR
ENGINEERING APPLICATIONS**

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PREFACE

This standard was prepared by the Association's Committee on Metal Finishing to supersede AS K98—1962 and AS CK4—1962.

In preparing this standard, the committee considered draft document 65E issued by ISO/TC 107/SC 3* and decided basically to follow the same format in the presentation of this standard. This particularly applies to the classification code which covers the basis metal, any appropriate undercoat, and thickness of the chromium coating.

The committee considered that the technology of the chromium deposition process is sufficiently advanced as to permit withdrawal of AS CK4, but resolved to include additional requirements for other types of chromium coatings in use, especially cracked and porous type coatings, the latter being based on U.S. MIL-C-20218E†. The porosity photomicrographs reproduced as Appendix C to this standard have been taken from MIL-C-20218E and grateful acknowledgement thereto is made.

A standard is in course of preparation which will give typical sampling plans as a guide for use between contracting parties when large numbers of items are being processed. However, it should be emphasized that these plans would not be satisfactory for small quantity production.

This standard requires reference to the following standards:

AS 2331	Methods of Test for Metallic and Related Coatings
AS 2483	Recommended Sampling Procedures for the Inspection and Testing of Electroplated and Related Coatings on Metallic Items‡
AS K178	Glossary of Terms Used in Electroplating§
AS CK13	Code of Recommended Practice for the Preparation of Metal Surfaces for Electroplating§

* ISO/TC 107 Metallic and Other Non-organic Coatings, Subcommittee 3—Electrodeposited Coatings and Related Finishes

† Chromium Plating, Electrodeposited, Porous

‡ In course of preparation

§ In course of revision

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

for

**ELECTROPLATED COATINGS OF CHROMIUM
FOR ENGINEERING APPLICATIONS**

1 SCOPE. This standard specifies requirements for electroplated coatings of hard chromium on ferrous and non-ferrous metals for engineering applications.

NOTE: Guidelines to purchasers on requirements that must be specified by the purchaser and those that must be agreed at the time of enquiry and/or order are given in Appendix A.

2 DEFINITIONS. For the purpose of this standard, the definitions given in AS K178 and the following apply:

2.1 Surface—the surface of the item on which the electroplater is to work.

2.2 Significant surface—that part of the surface of an item which is required to be covered by the coating and which is essential to the appearance and serviceability of the item.

2.3 Undercoat—a preliminary coating applied to alter the surface characteristics of the basis metal.

NOTE: The use of an undercoat may also prevent epitaxy, provide an adequate diffusion layer, and serve other physical purposes which are of benefit to the performance of the electroplated item.

2.4 Finished state—the condition of the item at the completion of all electroplating operations.

2.5 Inspection batch—a collection of items from which a sample is to be randomly drawn and inspected to determine compliance with the acceptance criteria.

NOTE: An inspection batch may differ from a collection of product items designated as a lot for other purposes, such as production, shipment and storage.

3 CONDITION OF THE ITEM BEFORE ELECTROPLATING.

3.1 Surface Finish. The surface finish of the item shall comply with the particular requirements of the purchaser, where any such requirements are so specified (see Appendix A).

NOTE: The surface finish may be important to the appearance or serviceability of the item and it is the purchaser's responsibility to provide precise details to the electroplater at the time of order.

3.2 Preplating Condition. The item as delivered to the electroplater shall be in a condition suitable for electroplating.

NOTE: If the item is to be supplied in a condition requiring mechanical pretreatment the details should be agreed between the purchaser and the electroplater (see Appendix A).

Steel items which have been severely cold worked or steels having a tensile strength of 1100 MPa or above should be heat treated before plating. General guidance on suitable times and temperatures is given in AS CK13.

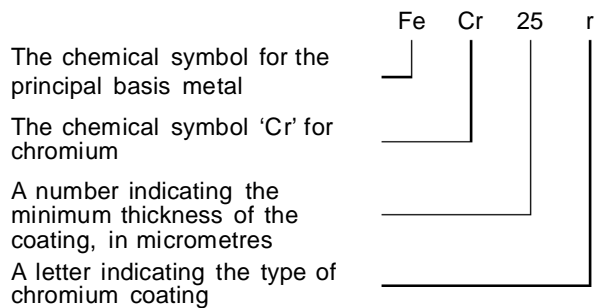
Steels which have been chemically or electrically stripped of old coatings shall be heat treated within 6 h of stripping, as follows:

- (a) Low alloy steel parts having tensile strengths of 1100 MPa or above 3 h at 190 ±14°C.
- (b) Carburized steel parts 5 h at 135 ±14°C.

NOTE: Heat treatment is not required for 17/4, 17/7, 15/5 type stainless steels or 300 type series stainless steels, copper alloys, nickel base alloys, or low alloy steels having a tensile strength level below 1100 MPa. Aluminium and alloy parts should be heat treated for 1 h at 93 ±14°C.

4 CLASSIFICATION. Chromium coatings are classified according to thickness and the type of coating.

The full classification code comprises the following:



The chemical symbol for the principal basis metal

The chemical symbol 'Cr' for chromium

A number indicating the minimum thickness of the coating, in micrometres

A letter indicating the type of chromium coating

NOTE: The above example shows the code for 25 µm of regular chromium on iron or steel.

Symbols for types of chromium coatings are as follows:

- r —regular chromium coating
- cf —crack-free type coating
- pp —pinpoint type porous coating
- cp —channel point type porous coating
- ip —intermediate type porous coating
- mep —mechanically produced porous coating

NOTE: Types of mechanically produced coatings include ground or honed coatings.

5 COATING REQUIREMENTS.

5.1 General. The chromium coating shall be electroplated and be of the specified type.

Coatings on samples selected in accordance with the agreed sampling plan, as provided for in Appendix A, shall comply with the requirements of Clauses 5.2 to 5.7.

Items which are to be subsequently machined shall be free from excessive nodulation and treeing at the edges and from imperfections detrimental to subsequent fabrication. There shall be no blistering or other signs of poor adhesion of the coating on any surface of an item.

NOTE: On items where a contact mark is unavoidable, the position of the mark is subject to agreement between the purchaser and the electroplater (see Appendix A).

Electroplated items shall be clean and free from damage.