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International Standard



4520

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Chromate conversion coatings on electroplated zinc and cadmium coatings

Couches de conversion au chromate sur les dépôts électrolytiques de zinc et de cadmium

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4520 was developed by Technical Committee ISO/TC 107, *Metallic and other non-organic coatings*, and was circulated to the member bodies in December 1980.

It has been approved by the member bodies of the following countries :

Australia	India	South Africa, Rep. of
Brazil	Italy	Spain
Czechoslovakia	Japan	Sweden
Egypt, Arab Rep. of	Netherlands	Switzerland
France	Poland	United Kingdom
Hungary	Romania	USA

The member body of the following country expressed disapproval of the document on technical grounds :

Germany, F. R.

Chromate conversion coatings on electroplated zinc and cadmium coatings

0 Introduction

Coatings of zinc and cadmium are chromate treated in order to retard the formation of corrosion products on the surfaces of coatings exposed in corrosive atmospheres. Chromate treatment is particularly effective in retarding the formation of white corrosion products which form on zinc and cadmium coatings under certain conditions.

Thicknesses of electroplated coatings suitable for chromate treatment are covered by the relevant International Standards, i.e. ISO 2081 and ISO 2082.

1 Scope and field of application

This International Standard specifies requirements relating to chromate conversion coatings on zinc and cadmium intended to give protection against corrosion. Finishes for giving particular colours only or specifically to improve paint adhesion are not covered by this International Standard.

2 References

ISO 2081, *Metallic coatings — Electroplated coatings of zinc on iron and steel.*

ISO 2082, *Metallic coatings — Electroplated coatings of cadmium on iron and steel.*

ISO 3613, *Chromate conversion coatings on zinc and cadmium — Test methods.*

ISO 3768, *Metallic coatings — Neutral salt spray test (NSS test).*

ISO 3892, *Conversion coatings on metallic materials — Determination of coating mass per unit area — Gravimetric methods.*

3 Method of application of chromate conversion coatings

Chromate conversion coatings are normally applied by dipping. Chromating solutions are usually acidic and contain hexavalent chromium salts together with other salts which may be varied to affect the appearance and hardness of the film. The colour of the film, and, therefore, the type of conversion coating, depends on the composition of the chromating solution, but is also affected by pH and temperature, the duration of treatment and the nature and surface condition of the coating being treated. Bright, transparent films on zinc and cadmium coatings can be obtained by dipping in appropriate solutions. On zinc, they can also be obtained by bleaching iridescent films in alkaline solutions or in phosphoric acid.

If hot water is used as the final rinse after the chromating process, it is essential that the time of rinsing should be kept as short as possible in order to prevent the dissolution of the hexavalent chromium. The drying of the article shall be carried out at a temperature not exceeding 60 °C to prevent cracking due to dehydration of the chromate coating. (Any heat treatment for the relief of hydrogen embrittlement shall be carried out before a chromate conversion coating is applied.)

4 Classification

Finishes can be applied ranging from thick, dark, olive-green coatings with good protective properties to thin, transparent, sometimes bluish films of attractive appearance but with limited protective value.

Electroplaters can seldom guarantee to supply exact shades of colour with chromate conversion coatings. If it is necessary to have exact shades of colour, it is possible to dye bleached chromate coatings to obtain a wide range of colours, but they can only be expected to give an order of added corrosion resistance similar to that provided by the colourless bleached coatings.