SLOVENSKI STANDARD
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Kovinske in druge anorganske prevleke - S kromanjem nanesene plasti na cinku, kadmiju, zlitinah aluminij-cink in cink-aluminij - Metode preskušanja (ISO/DIS 3613:2020)

Metallic and other inorganic coatings - Chromate conversion coatings on zinc, cadmium, aluminium-zinc alloys and zinc-aluminium alloys - Test methods (ISO/DIS 3613:2020)

Metallische und andere anorganische Überzüge - Chromatierüberzüge auf Zink, Cadmium, Aluminium-Zink- und Zink-Aluminium-Legierungen - Prüfverfahren (ISO/DIS 3613:2020)

Revêtements métalliques et autres revêtements inorganiques - Couches de conversion au chromate sur zinc, cadmium, et alliages d'aluminium-zinc et de zinc-aluminium - Méthodes d'essai (ISO/DIS 3613:2020)

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Metallic and other inorganic coatings — Chromate conversion coatings on zinc, cadmium, aluminium-zinc alloys and zinc-aluminium alloys — Test methods

Revêtements métalliques et autres revêtements inorganiques — Couches de conversion au chromate sur zinc, cadmium et alliages d'aluminium-zinc et de zinc-aluminium — Méthodes d'essai

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 107, *Metallic and other inorganic coating*.

This fourth edition cancels and replaces the third edition (ISO 3613:2010), which has been technically revised.

The main changes compared to the previous edition are as follows:

— Table 1 was amended.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document specifies methods for the qualitative determination of the presence of chromate conversion coatings as well as the total chromium content of chromate conversion coatings.

The application of very thin, colourless, practically invisible chromate conversion coatings is frequently called “passivation”, while the application of thicker, coloured chromate conversion coatings is called “chromating”. The term “passivation” is not correct, does not comply with the ISO 2080 designation and is therefore deprecated.

Metallic and other inorganic coatings — Chromate conversion coatings on zinc, cadmium, aluminium-zinc alloys and zinc-aluminium alloys — Test methods

WARNING — This International Standard calls for the use of substances and/or procedures that may be injurious to health if adequate safety measures are not taken. This International Standard does not address any health hazards, safety or environmental matters associated with its use. It is the responsibility of the user of this International Standard to establish appropriate health, safety and environmentally acceptable practices and take suitable actions for any national and international regulations. Compliance with this International Standard does not in itself confer immunity from legal obligations.

1 Scope

This document specifies methods for the determination of

— the presence of colourless chromate conversion coatings,

— the presence of hexavalent chromium in colourless and coloured coatings on zinc or cadmium or aluminium-zinc (mass fraction of aluminium: 55 %, within a range of 54 % to 56 % mass fraction) and zinc-aluminium (mass fraction of aluminium: 5 %) alloys,

— the total chromium content per unit area on zinc and cadmium,

— the mass per unit area of both colourless and coloured coatings,

— the satisfactory adhesion of chromate conversion coatings, and

— the quality of chromate coatings.

These methods are applicable

— to colourless and coloured chromate conversion coatings containing trivalent and hexavalent chromium in varying proportions and produced by either chemical or electrochemical processes, and

— only to chromate coatings that are free from any supplementary coatings, such as oil, water or solvent-based polymers or wax.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 4520, *Chromate conversion coatings on electroplated zinc and cadmium coatings*

IEC 60068-2-30, *Environmental testing — Part 2-30: Tests — Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Reagents

Use only reagents of recognized analytical grade and distilled water or water of equivalent purity, unless otherwise specified, for analysis.

4.1 Test solution A (see 6.2).

Dissolve 1 g of diphenylcarbazide in a mixture of 20 ml of acetone, 60 ml of glacial acetic acid and 40 ml of distilled water contained in a beaker. Add 15 ml of concentrated hydrochloric acid (ρ = 1,18 g/cm^3), stir and add slowly 30 ml of sodium hypochlorite solution (10 % to 15 % available chlorine). Add 5 ml of hydrogen peroxide (30 % volume fraction) slowly with continuous stirring. Leave the solution in the open beaker for 24 h in a fume cupboard, to allow excess chlorine to escape, before use.

The solution does not deteriorate with age and can be kept in a bottle with a loosely fitted stopper. However, there may be losses due to evaporation and the concentration may alter so it is discarded after 6 months.

4.2 Test solution B (see 6.3).

Dissolve 50 g of lead acetate trihydrate [$(CH_3COO)_2Pb{\cdot}3H_2O$] in 1 l of distilled water or water of equivalent purity. Ensure that the pH of the solution is between 5,5 and 6,8 as prepared. If the pH of the solution is outside this range, discard the solution and obtain a new supply of lead acetate.

Any white precipitate formed during the initial preparation of the solution may be dissolved by small additions of glacial acetic acid, provided that the pH is not reduced to a value below 5,5. Discard the stock solution if the white precipitate does not disappear.

4.3 Test solution C (see 6.5)

4.3.1 Test solution C 1

Dissolve 0,4 g of diphenylcarbazide in a mixture of 20 ml of acetone and 20 ml of ethanol (96 %). After dissolution, add 20 ml of 75 % orthophosphoric acid solution and 20 ml of distilled water. Prepare this solution not more than 8 h prior to use.

4.3.2 Test solution C 2

Add 700 ml of orthophosphoric acid, of specific gravity 1,7, to 250 ml of distilled water or water of equivalent purity and make up to 1 000 ml.

Dissolve 0,5 g of 1,5-diphenylcarbazide of analytical reagent grade in 50 ml of acetone of analytical reagent grade. Dilute slowly, while stirring, with 50 ml of distilled water or water of equivalent purity (rapid mixing may result in precipitation of dipehnylcarbazide). Keep the solution in a dark glass bottle in the refrigerator. The solution shall be discarded after 4 weeks or earlier when the solution becomes discoloured.

For the Cr(VI) stock solution, dissolve 0,113 g of $K_2Cr_2O_7$ of analytical reagent grade (dried for 1 h at 100 °C before use) in distilled water or water of equivalent purity and make up to the mark in a 1 000 ml volumetric flask. The solution shall be discarded after 9 months.

From this stock solution prepare two Cr(VI) standard solutions.

