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Fasteners - Electroplated coating systems (ISO 4042:2018)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 04/19

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EN ISO 4042

September 2018

ICS 21.060.01 Supersedes EN ISO 4042:1999

English Version

Fasteners - Electroplated coating systems (ISO 4042:2018)

Fixations - Systèmes de revêtements électrolytiques (ISO 4042:2018)

Verbindungselemente - Galvanisch aufgebrachte Überzugsysteme (ISO 4042:2018)

This European Standard was approved by CEN on 4 July 2018.

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Contents

Page

European foreword

This document (EN ISO 4042:2018) has been prepared by Technical Committee ISO/TC 2 "Fasteners" in collaboration with Technical Committee CEN/TC 185 “Fasteners” the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2019, and conflicting national standards shall be withdrawn at the latest by March 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 4042:1999.

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Endorsement notice

The text of ISO 4042:2018 has been approved by CEN as EN ISO 4042:2018 without any modification.

INTERNATIONAL STANDARD

ISO 4042

Third edition
2018-08

Fasteners — Electroplated coating systems

Fixations — Systèmes de revêtements électrolytiques

Reference number
ISO 4042:2018(E)

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Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 14, *Surface coatings*.

This third edition cancels and replaces the second edition (ISO 4042:1999), which has been technically revised. The main changes compared to the previous edition are as follows:

— application to all fasteners, including self-tapping and thread forming screws, washers, rivets, clips, etc.;

— focus on coatings designed for corrosion protection of fasteners;

— application to electroplated coating systems with or without additional layers (conversion coating, sealant, top coat, lubricant);

— specification of minimum corrosion resistance (white corrosion and red rust);

— inclusion of up-to-date knowledge about hydrogen embrittlement and prevention measures;

— definitions specified in ISO 1891-2;

— concerning corrosion tests, inclusion of sulfur dioxide test (Kesternich) and calibration of neutral salt spray test;

— inclusion of gaugeability and assemblability requirements;

— for thickness determination, addition of adequate test methods and deletion of the batch average thickness;

— new designation system for all coating systems;

— specification for mechanical and physical properties and related test methods;

— information about design aspects and assembly of coated fasteners;

— information for coating thickness and thread clearance for ISO metric screw threads;

— information about evaluation of cabinet corrosivity for the neutral salt spray test.

Introduction

This document was completely revised to take into account new developments related to hexavalent chromium free passivations, application of sealants and top coats, requirements for functional properties as well as results of research work to minimize the risk of hydrogen embrittlement.

INTERNATIONAL STANDARD **ISO 4042:2018(E)**

Fasteners — Electroplated coating systems

1 Scope

This document specifies requirements for electroplated coatings and coating systems on steel fasteners. The requirements related to dimensional properties also apply to fasteners made of copper or copper alloys.

It also specifies requirements and gives recommendations to minimize the risk of hydrogen embrittlement; see 4.4 and Annex B.

It mainly applies to zinc and zinc alloy coating systems (zinc, zinc-nickel, zinc-iron) and cadmium, primarily intended for corrosion protection and other functional properties:

— with or without conversion coating;

— with or without sealant;

— with or without top coat;

— with or without lubricant (integral lubricant and/or subsequently added lubricant).

Specifications for other electroplated coatings and coating systems (tin, tin-zinc, copper-tin, copper-silver, copper, silver, copper-zinc, nickel, nickel-chromium, copper-nickel, copper-nickel-chromium) are included in this document only for dimensional requirements related to fasteners with ISO metric threads.

This document applies to bolts, screws, studs and nuts with ISO metric thread, to fasteners with non-ISO metric thread, and to non-threaded fasteners such as washers, pins, clips and rivets.

Information for design and assembly of coated fasteners is given in Annex A.

This document does not specify requirements for properties such as weldability or paintability.

NOTE Other International Standards specify differing electroplating processes. For electroplating of fasteners, the requirements of this document apply, unless otherwise agreed.

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 1456, *Metallic and other inorganic coatings — Electrodeposited coatings of nickel, nickel plus chromium, copper plus nickel and of copper plus nickel plus chromium*

ISO 1463, *Metallic and oxide coatings — Measurement of coating thickness — Microscopical method*

ISO 1502, *ISO general-purpose metric screw threads — Gauges and gauging*

ISO 1891-2, *Fasteners — Terminology — Part 2: Vocabulary and definitions for coatings*

ISO 2081, *Metallic and other inorganic coatings — Electroplated coatings of zinc with supplementary treatments on iron or steel*

ISO 2082, *Metallic and other inorganic coatings — Electroplated coatings of cadmium with supplementary treatments on iron or steel*

ISO 2093, *Electroplated coatings of tin — Specification and test methods*

ISO 2177, *Metallic coatings — Measurement of coating thickness — Coulometric method by anodic dissolution*

ISO 2178, *Non-magnetic coatings on magnetic substrates — Measurement of coating thickness — Magnetic method*

ISO 3231, *Paints and varnishes — Determination of resistance to humid atmospheres containing sulfur dioxide*

ISO 3497, *Metallic coatings — Measurement of coating thickness — X-ray spectrometric methods*

ISO 3613:2010, *Metallic and other inorganic coatings — Chromate conversion coatings on zinc, cadmium, aluminium-zinc alloys and zinc-aluminium alloys — Test methods*

ISO 4521, *Metallic and other inorganic coatings — Electrodeposited silver and silver alloy coatings for engineering purposes — Specification and test methods*

ISO 6988, *Metallic and other non organic coatings — Sulfur dioxide test with general condensation of moisture*

ISO 8991, *Designation system for fasteners*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

ISO 15330, *Fasteners — Preloading test for the detection of hydrogen embrittlement — Parallel bearing surface method*

ISO 15726, *Metallic and other inorganic coatings — Electrodeposited zinc alloys with nickel, cobalt or iron*

ISO 16047, *Fasteners — Torque/clamp force testing*

ISO 16228, *Fasteners — Types of inspection documents*

ISO 19598, *Metallic coatings — Electroplated coatings of zinc and zinc alloys on iron or steel with supplementary Cr(VI)-free treatment*

ISO 21968, *Non-magnetic metallic coatings on metallic and non-metallic basis materials — Measurement of coating thickness — Phase-sensitive eddy-current method*

ASME B18.6.3, *Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series)*