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# Fasteners — Electroplated coating systems

*Fixations — Systèmes de revêtements électrolytiques*



Reference number  
ISO 4042:2022(E)

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## 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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

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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 14, *Surface coatings*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 185, *Fasteners*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 4042:2018), which has been technically revised. The main changes are as follows:

- in [Clause 1](#), a statement has been added that the requirements of this document for electroplated fasteners have precedence over other documents dealing with electroplating;
- all references to ISO 2081 and ISO 19598 have been removed because ISO 4042 is a self-containing document for the purpose of fasteners;
- in [4.4](#), the measures to prevent internal hydrogen embrittlement for nuts, flat washers and case-hardened screws have been completely revised;
- in [6.4](#), the reference areas for thickness determination have been more clearly specified;
- wording in the whole document has been improved to be more accurate, especially for complex topics.

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](http://www.iso.org/members.html).

## Introduction

ISO 4042:1999 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. This revision was published in 2018.

The last editions of ISO 2081:2018 as well as ISO 19598:2016, which are general standards for electroplating, are not adequate to cover the requirements for electroplated fasteners dealt with in ISO 4042, especially with regard to hydrogen embrittlement and baking. Therefore, a new revision of ISO 4042:2018 was necessary to delete all references to these two general standards to avoid any contradictions.

For electroplated nuts, flat washers, and case-hardened screws, measures to mitigate the risk of hydrogen embrittlement, especially in relation to baking, have been revised to be consistent with revisions of ISO 898-2 and ISO 2702, and to reflect findings from the latest research works. For electroplated flat washers in accordance with ISO 898-3, it is generally accepted that tensile stress resulting from intended and unintended bending in service may increase the risk of hydrogen embrittlement. An appropriate test method to simulate such a scenario is currently under investigation.