



Technical Specification

ISO/TS 25393

Fasteners — Coating system assessment — Complementary and additional aspects to CQI-11

*Fixations — Évaluation des systèmes de revêtement
électrolytiques — Aspects complémentaires et additionnels au
CQI-11*

**First edition
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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 document 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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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).

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

Plating system assessment (CQI-11) 3rd edition was developed by AIAG (Automotive Industry Action Group) with the intent to help better evaluation of the quality systems in place at plating shops supplying OEM automotive coatings such as zinc and zinc alloy electrodeposits, decorative plating applied to metal or plastic substrates, and hard chromium deposits, as well as electroless nickel and electropolishing processes. The objective of the 3rd edition of CQI-11 was to update as needed, improve document clarity, and include the ISO 9001 and IATF 16949:2016 Quality Management System concepts of “Process Approach” and “Risk Management”.

The Automotive Industry Action Group (AIAG) was founded in 1982 by representatives of the three largest North American automotive manufacturers: Ford, General Motors and Chrysler. It was originally created to develop recommendations and a framework for the improvement of quality in the North-American automotive industry. Among others, the AIAG publishes automotive industry standards, including Production Part Approval Process (PPAP) quality specifications. These documents have become a de facto quality standard in North America that have to be complied with by all Tier 1 suppliers. Increasingly, these suppliers are now requiring complete compliance from their suppliers, so that many Tier 2 and 3 automotive suppliers now shall also comply.

CQI-11 is intended to be a self-Assessment auditing tool for electroplating processes, and its 3rd edition was published by AIAG in 2019; its goal is that “... *all customer engineering design record and specification requirements are properly understood by the supplier and that the process has the potential to produce product consistently meeting these requirements during an actual production run at the quoted production rate.*” CQI-11 is used in the automotive supply chain to establish confidence in component suppliers and their production processes.

However, CQI-11 remains a general system assessment for plating automotive parts. For the purpose of fastener coating and in order to achieve the expected functional properties of the fasteners as specified in ISO 4042, some specific modulus should also be considered additionally to CQI-11 and/or some “questions/items” need to be completed.

The purpose of this document is to specifically address fastener-specific aspects not fully covered by CQI-11, and to clarify some questions/items when its content is not applicable or not suitable for fasteners.

This document should be used as guidance by the electroplaters additionally to CQI-11, for the appropriate application to fasteners.

This document is primarily established from the following basic documents:

- ISO 4042, *Fasteners — Electroplated coating systems*;
- ISO/TR 20491, *Fasteners — Fundamentals of hydrogen embrittlement in steel fasteners*;
- ISO 16047, *Fasteners — Torque/clamp force testing*.

It is consistent with ASTM F1941/F1941M and ASTM B633.

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Fasteners — Coating system assessment — Complementary and additional aspects to CQI-11

1 Scope

This document deals with electroplating process evaluation for fasteners, including fastener expected coating properties.

This document is a complement to CQI-11 in order to deal with fastener specific aspects not fully covered by CQI-11, and to clarify some questions/items when they are not fully suitable for fasteners.

This document is applicable to all parties involved in the supply chain for coated fasteners, i.e. fastener manufacturers, chemical suppliers, electroplaters and purchasers.

The requirements for electroplating fasteners specified in this document are essentially based on ISO 4042, ISO/TR 20491 and ISO 16047.

NOTE Requirements for electroplating fasteners are also given in ASTM F1941/F1941M.

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

ISO 4042:2022, *Fasteners — Electroplated coating systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1891-2 and the following apply.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 rework

action to remove a coating system and to reprocess the targeted coating system

Note 1 to entry: The removal of the initially electrolytically applied coating is usually performed through a stripping step, using an acid solution.

4 Application of CQI-11 to fasteners

4.1 Applicability

The applicability of CQI-11 requirements to fasteners are as specified in [Table 1](#).