



**International
Standard**

ISO 16364

**Corrosion of metals and alloys —
Guidelines for galvanic corrosion
control**

*Corrosion des métaux et alliages — Lignes directrices pour le
contrôle de la corrosion galvanique*

**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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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 156, *Corrosion of metals and alloys*.

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

Use of multi-materials (i.e. use of metal materials as well as ceramics, semiconductors, carbon fibre and resins in structures) is advancing rapidly in industrial fields like electronic components, automobiles, aircraft, plant systems and infrastructure, among others. This has increased the possibility of galvanic corrosion, heightening the necessity of a comprehensive, cross-sectorial guideline for galvanic corrosion suppression that includes materials and their environments. However, there are no clear provisions concerning galvanic corrosion or standards other than bolting of dissimilar materials. The boundary element method (BEM) and the finite element method (FEM) enable modelling and numerical calculation of galvanic corrosion. Simulations by these methods have progressed and are already used in practical applications. Moreover, accompanying the application of multi-materials such as carbon and other non-metallic materials eluted from ceramics, carbon fibre reinforced plastic (CFRP) or resins is related to galvanic corrosion. This galvanic corrosion has become a critical issue in automobiles, aircraft, etc.

Under these circumstances, a cross-sectorial guideline on galvanic corrosion, with its many inherent issues, is necessary.

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Corrosion of metals and alloys — Guidelines for galvanic corrosion control

1 Scope

This document specifies standard methods for avoiding galvanic corrosion in the design stage and for determining whether actual corrosion damage was caused by galvanic corrosion. It also specifies guideline for standard methods for suppressing galvanic corrosion.

This document also provides guidance for predicting galvanic corrosion in different environments (e.g. in water and in atmospheric and soil environments) by numerical calculation based on polarization data.

This document does not establish the grounds for indexes related to safety or the loss of functions of materials in actual use. However, this document can be used to estimate the function maintenance life and safety maintenance life of these materials in advance. The responsibility for using the guideline rests with the reader.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 corrosion potential

potential measured when materials A and B are immersed individually in the environmental *electrolyte* (3.3) concerned

Note 1 to entry: Corrosion potential is given as either noble or base potential. Noble potential indicates a potential on the positive side. Base potential indicates a potential on the negative side.

3.2 coupling potential

potential measured when an electrical short circuit is established between materials A and B which are in contact with the *electrolyte* (3.3) concerned

3.3 electrolyte

ionically conductive liquid or solid medium covering the surfaces of material A and material B

3.4 area ratio

ratio of the area of material A with a base *corrosion potential* (3.1) and material B with a noble corrosion potential