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BSI Standards Publication

Corrosion of metals and alloys — Test method for corrosion of materials by electrochemical impedance measurements

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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TECHNICAL REPORT

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Corrosion of metals and alloys — Test method for corrosion of materials by electrochemical impedance measurements

Corrosion des métaux et alliages — Méthode d'essai pour la corrosion des matériaux par des mesures électrochimiques d'impédance

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Foreword

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 156, *Corrosion of metals and alloys*.

TECHNICAL REPORT **ISO/TR 16208:2014(E)**

Corrosion of metals and alloys — Test method for corrosion of materials by electrochemical impedance measurements

1 Scope

This Technical Report describes basic principles of electrochemical impedance spectroscopy (EIS), specially focusing on the corrosion of metallic materials. It also deals with how to use electrochemical apparatus, set up and connect electrical instruments, present measured data, and analyse results. However, a more detailed description of this methodology can be found in ISO 16773-1 and ISO 16773-2.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 16773-1, *Paints and varnishes — Electrochemical impedance spectroscopy (EIS) on high-impedance coated specimens — Part 1: Terms and definitions*

ISO 16773-2, *Paints and varnishes — Electrochemical impedance spectroscopy (EIS) on high-impedance coated specimens — Part 2: Collection of data*

ISO 16773-3, *Paints and varnishes — Electrochemical impedance spectroscopy (EIS) on high-impedance coated specimens — Part 3: Processing and analysis of data from dummy cells*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16773-1 and the following apply.

3.1
bode plot
phase angle and the logarithm of the impedance magnitude $|Z|$ plotted versus the logarithm of the applied frequency

3.2
constant phase element
CPE
equivalent circuit component that models the behaviour of an imperfect capacitor representing a constant phase shift through the whole frequency range

Note 1 to entry: A capacitor has a phase shift of −90°; for a CPE, the absolute value is smaller.

3.3
counter electrode
inert electrode in the electrochemical cell through which the current passes from or to the working electrode

Note 1 to entry: The counter electrode is also called auxiliary electrode.

