
Barve in laki - Elektrokemijska impedan[na spektroskopija (EIS) vzorcev z visoko impedanco - 1. del: Pojmi in definicije (ISO 16773-1:2007)

Paints and varnishes - Electrochemical impedance spectroscopy (EIS) on high-impedance coated specimens - Part 1: Terms and definitions (ISO 16773-1:2007)

Beschichtungsstoffe - Elektrochemische Impedanzspektroskopie (EIS) von beschichteten Proben mit hoher Impedanz - Teil 1: Begriffe (ISO 16773-1:2007)

Peintures et vernis - Spectroscopie d'impédance électrochimique (SIE) sur des éprouvettes revetues a haute impédance - Partie 1: Termes et définitions (ISO 16773-1:2007)

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Ta slovenski standard je istoveten z: EN ISO 16773-1:2007

ICS:

87.040

Barve in laki

Paints and varnishes

SIST EN ISO 16773-1:2007

en,fr,de

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English Version

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Foreword

This document (EN ISO 16773-1:2007) has been prepared by Technical Committee ISO/TC 35 "Paints and varnishes" in collaboration with Technical Committee CEN/TC 139 "Paints and varnishes", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by October 2007, and conflicting national standards shall be withdrawn at the latest by October 2007.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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**Paints and varnishes — Electrochemical
impedance spectroscopy (EIS) on
high-impedance coated specimens —**

**Part 1:
Terms and definitions**

*Peintures et vernis — Spectroscopie d'impédance électrochimique
(SIE) sur des éprouvettes revêtues de haute impédance —
Partie 1: Termes et définitions*

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Published in Switzerland

Foreword

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The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 16773-1 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

ISO 16773 consists of the following parts, under the general title *Paints and varnishes — Electrochemical impedance spectroscopy (EIS) on high-impedance coated specimens*:

- *Part 1: Terms and definitions*
- *Part 2: Collection of data*
- *Part 3: Processing and analysis of data from dummy cells* ¹⁾
- *Part 4: Examples of spectra of polymer-coated specimens* ¹⁾

¹⁾ In preparation.

Introduction

ISO 16773 describes a procedure for the evaluation of protective anticorrosion coatings by using electrochemical impedance spectroscopy (EIS).

Part 1 defines terms used in electrochemical impedance spectroscopy.

Part 2 describes an experimental procedure for testing laboratory instrumentation for collecting and presenting EIS data collected under potentiostatic control for high-impedance organic coatings on metal surfaces. Part 2 specifies a dummy cell that models the properties of a high-impedance system. It gives a test procedure and set-up parameters for the collection of impedance data from the dummy cell and the coated metal specimens. It outlines a procedure for comparing the recorded spectra with the theoretical data for the dummy cell in order to establish guidelines for acceptable instrumental accuracy and limitations. It does not provide any guidance on data interpretation.

Part 3 deals with the procedure used for the evaluation of the experimental results obtained from dummy cells which simulate high-impedance coated samples and it gives acceptance criteria for the values obtained.

Part 4, which is informative in nature, includes some background on impedance spectra of coated metal specimens and some typical examples of spectra from actual coatings.

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Paints and varnishes — Electrochemical impedance spectroscopy (EIS) on high-impedance coated specimens —

Part 1: Terms and definitions

1 Scope

This part of ISO 16773 gives terms and definitions for electrochemical impedance spectroscopy (EIS) for use in the other parts of ISO 16773.

2 Terms and definitions

2.1

peak-to-peak amplitude

maximum value between maximum and minimum excitation of the applied a.c. perturbation signal

2.2

rms amplitude

root-mean-square (i.e. effective) value of the applied a.c. perturbation signal

NOTE This is the peak-to-peak value of the a.c. amplitude, divided by $2 \times \sqrt{2}$.

2.3

Bode plot

curves of (a) phase angle versus the logarithm of the applied frequency and (b) the logarithm of the magnitude of the impedance $|Z|$ versus the logarithm of the applied frequency

2.4

coating

continuous layer formed from a single or multiple application of a coating material to a substrate

[ISO 4618:2006]

2.5

corrosion potential

potential of a corroding surface at which the rate of oxidation (corrosion) and the rate of reduction of the one or more oxidants are equal

NOTE 1 This is also known as the mixed potential or the rest potential.

NOTE 2 This potential is measured relative to a reference electrode under open-circuit conditions.

2.6

corrosion rate

amount of metal lost in unit time

NOTE This can be expressed, for example, as the change in mass per unit area per unit time.