

## **Metallkatted. Ülevaade poorsuskatsetest**

Metallic coatings - Review of porosity tests

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 10308:2006 sisaldab Euroopa standardi EN ISO 10308:2006 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 27.02.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 10308:2006 consists of the English text of the European standard EN ISO 10308:2006.</p> <p>This document is endorsed on 27.02.2006 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
--	---

<p><b>Käsitlusala:</b></p> <p>Standard annab ülevaate publitseeritud meetoditest, mida kasutatakse alumiiniumist, anodeeritud alumiiniumist, vasest, kaadmiumist, kroomist, koobaltist, vasest, kullast, indiumist, pliiist, niklist, nikkelboorist, nikkelkoobaltist jne katetes ilmnevate pooride ja katkestuste kindlakstegemiseks. Selles standardis kokkuvõetud katsete eesmärgiks on aluspinna paljandumisele (katkestuse korral kattes) reageerimisel saada jälgitava reaktsiooni tulemus.</p>	<p><b>Scope:</b></p> <p>This International Standard reviews published methods for revealing pores (see ISO 2080) and discontinuities in coatings of aluminium, anodized aluminium, brass, cadmium, chromium, cobalt, copper, gold, indium, lead, nickel, nickel-boron, nickel-cobalt, nickel-iron, nickel-phosphorus, palladium, platinum, vitreous or porcelain enamel, rhodium, silver, tin, tin-lead, tin-nickel, tin-zinc, zinc and chromate or phosphate conversion coatings (including associated organic films) on aluminium, beryllium-copper, brass, copper, iron, NiFeCo alloys, magnesium, nickel, nickel-boron, nickel-phosphorus, phosphor-bronze, silver, steel, tin-nickel and zinc alloy basis metal.</p>
---	---

ICS 25.220.40

**Võtmesõnad:** katsed, katted, kindlakstegemine, metallkatted, määramine, pinna omadused, poorid, poorsus, vaatlused

English Version

## Metallic coatings - Review of porosity tests (ISO 10308:2006)

Revêtements métalliques - Passage en revue des essais  
de porosité (ISO 10308:2006)

Metallische Überzüge - Übersicht der Porenprüfverfahren  
(ISO 10308:2006)

This European Standard was approved by CEN on 28 December 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, 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.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

## Foreword

This document (EN ISO 10308:2006) has been prepared by Technical Committee ISO/TC 107 "Metallic and other inorganic coatings" in collaboration with Technical Committee CEN/TC 262 "Metallic and other inorganic coatings", the secretariat of which is held by BSI.

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 July 2006, and conflicting national standards shall be withdrawn at the latest by July 2006.

This document supersedes EN ISO 10308:1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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.

## Endorsement notice

The text of ISO 10308:2006 has been approved by CEN as EN ISO 10308:2006 without any modifications.

---

---

**Metallic coatings — Review of porosity tests**

*Revêtements métalliques — Passage en revue des essais de porosité*



**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO 2006

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

Foreword.....	iv
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Terms and definitions.....</b>	<b>1</b>
<b>4 Principle.....</b>	<b>2</b>
<b>5 Common features of porosity tests .....</b>	<b>2</b>
<b>6 Test specimens .....</b>	<b>2</b>
<b>7 Specific porosity tests .....</b>	<b>2</b>
7.1 Alizarin test.....	2
7.2 Anthraquinone test.....	3
7.3 Cadmium sulfide test.....	3
7.4 Copper sulfate (Preece) test.....	3
7.5 Copper sulfate (Dupernell) test.....	3
7.6 Corrodokote test (CORR) .....	4
7.7 Electrographic tests .....	4
7.8 Ferrocyanide test .....	5
7.9 Ferron test .....	5
7.10 Ferroxyl test .....	6
7.11 Flowers-of-sulfur porosity test.....	6
7.12 Hot-water test .....	6
7.13 Hydrogen sulfide or sulfur dioxide/hydrogen sulfide test.....	6
7.14 Haematoxylin test .....	7
7.15 Magneson test.....	7
7.16 Nitric acid vapour test .....	7
7.17 Oxine test.....	8
7.18 Permanganate test.....	8
7.19 Polysulfide test .....	8
7.20 Porotest test.....	8
7.21 Salt spray tests [neutral (NSS), acetic (AASS) and cuproacetic (CASS)] .....	9
7.22 Sulfur dioxide test.....	9
7.23 Sulfurous acid/sulfur dioxide vapour test.....	9
7.24 Thiocyanate test.....	9
7.25 Thioacetamide test (TAA) .....	10
7.26 Watch-case acetic acid test .....	10
7.27 Watch-case sodium bisulfite test.....	10
<b>Annex A (normative) Tables of porosity tests.....</b>	<b>11</b>
<b>Annex B (informative) Typical report and evaluation of porosity tests .....</b>	<b>14</b>
<b>Annex C (informative) Schematic representation of types of pore .....</b>	<b>16</b>
<b>Annex D (informative) Classification of discontinuities in metallic and other inorganic coatings .....</b>	<b>17</b>
<b>Annex E (informative) Classification of methods of testing coating porosity .....</b>	<b>18</b>
<b>Annex F (informative) Alphabetical list of tests by substrate and coating .....</b>	<b>19</b>
<b>Bibliography .....</b>	<b>30</b>

## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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 10308 was prepared by Technical Committee ISO/TC 107, *Metallic and other inorganic coatings*, Subcommittee SC 7, *Corrosion tests*.

This second edition cancels and replaces the first edition (ISO 10308:1995), which has been technically revised.



# Metallic coatings — Review of porosity tests

**WARNING —** This international Standard calls for the use of substances and/or procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and in no way absolves either the designer, the producer, the supplier or the user from statutory and all other legal obligations relating to health and safety at any stage of manufacture or use.

## 1 Scope

This International Standard reviews published methods for revealing pores (see ISO 2080) and discontinuities in coatings of aluminium, anodized aluminium, brass, cadmium, chromium, cobalt, copper, gold, indium, lead, nickel, nickel-boron, nickel-cobalt, nickel-iron, nickel-phosphorus, palladium, platinum, vitreous or porcelain enamel, rhodium, silver, tin, tin-lead, tin-nickel, tin-zinc, zinc and chromate or phosphate conversion coatings (including associated organic films) on aluminium, beryllium-copper, brass, copper, iron, NiFeCo alloys, magnesium, nickel, nickel-boron, nickel-phosphorus, phosphor-bronze, silver, steel, tin-nickel and zinc alloy basis metal.

The tests summarized in this International Standard are designed to react with the substrate when exposed, by a discontinuity, in such a way as to form an observable reaction product.

NOTE 1 Pores are usually perpendicular to the coating surface but may be inclined to the coating surface. They are frequently cylindrical in shape but may also assume a twisted shape (see Annex C).

NOTE 2 Porosity may vary in size from the submicroscopic, invisible using a light microscope, to the microscopic, visible from  $\times 10$  to  $\times 1\,000$ , to the macroscopic, visible to the naked eye.

NOTE 3 Porosity may be visibly indicated by discolouration of the coated surface.

NOTE 4 Porosity in a coating is not always detrimental. In microdiscontinuous chromium, for example, porosity or microcracking is beneficial and tests are conducted to indicate the pores.

NOTE 5 Results obtained from porosity tests, expressed in terms such as pores per square centimeter, are relative values associated with the specific test method used and the magnification used during examination. Annex B gives typical report criteria.

## 2 Normative references

The following referenced documents are indispensable for the application 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 2080:1981, *Electroplating and related processes — Vocabulary*

ISO 10289:1999, *Methods for corrosion testing of metallic and other inorganic coatings on metallic substrates — Rating of test specimens and manufactured articles subjected to corrosion tests*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2080 and the following apply.