SLOVENSKI STANDARD
SIST EN ISO 14647:2016

01-julij-2016

Kovinske prevleke - Ugotavljanje poroznosti v zlatih prevlekah na kovinskih podlagah - Preskus s hlapi dušikove kisline (ISO 14647:2000)

Metallic coatings - Determination of porosity in gold coatings on metal substrates - Nitric acid vapour test (ISO 14647:2000)

Metallische Überzüge - Bestimmung der Porosität in Goldbeschichtungen auf Metallsubstraten - Salpetersäure-Dampftest (ISO 14647:2000)

Revêtements métalliques - Détermination de la porosité des revêtements d'or sur les substrats de métal - Essai à la vapeur d'acide nitrique (ISO 14647:2000)

Ta slovenski standard je istoveten z: **EN ISO 14647:2016**

ICS:

25.220.40	Kovinske prevleke	Metallic coatings

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 14647

April 2016

ICS 25.220.40

English Version

Metallic coatings - Determination of porosity in gold coatings on metal substrates - Nitric acid vapour test (ISO 14647:2000)

Revêtements métalliques - Détermination de la porosité des revêtements d'or sur les substrats de métal - Essai à la vapeur d'acide nitrique (ISO 14647:2000)

Metallische Überzüge - Bestimmung der Porosität in Goldbeschichtungen auf Metallsubstraten - Salpetersäure-Dampftest (ISO 14647:2000)

This European Standard was approved by CEN on 2 April 2016.

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

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European foreword

The text of ISO 14647:2000 has been prepared by Technical Committee ISO/TC 107 “Metallic and other inorganic coatings” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 14647:2016 by 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of an identical text or by endorsement, at the latest by October 2016, and conflicting national standards shall be withdrawn at the latest by October 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 14647:2000 has been approved by CEN as EN ISO 14647:2016 without any modification.

INTERNATIONAL STANDARD

ISO 14647

First edition
2000-03-15

Metallic coatings — Determination of porosity in gold coatings on metal substrates — Nitric acid vapour test

Revêtements métalliques — Détermination de la porosité des revêtements d'or sur les substrats de métal — Essai à la vapeur d'acide nitrique

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 14647 was prepared by Technical Committee ISO/TC 107, *Metallic and other inorganic coatings*, Subcommittee SC 7, *Corrosion tests*.

Annexes A and B of this International Standard are for information only.

Introduction

Gold coatings are often specified for the contacts of separable electrical connectors and other devices. Electrodeposits are the form of gold that is most used on contacts, although it is also employed as clad metal and as weldments on the contact surface. The intrinsic nobility of gold enables it to resist the formation of insulating oxide films that could interfere with reliable contact operation.

In order that the nobility of gold be assured, porosity, cracks, and other defects in the coating that expose base metal substrates and underplates should be minimal or absent, except in those cases where it is feasible to use the contacts in structures that shield the surface from the environment or where corrosion inhibiting surface treatments for the deposit are employed. The level of porosity in the coating that may be tolerable depends on the severity of the environment to the underplate or substrate, design factors for the contact device like the force with which it is mated, circuit parameters, and the reliability of contact operation that it is necessary to maintain. Also, when present, the location of pores on the surface is important. If the pores are few in number and are outside the zone of contact of the mating surfaces, their presence can often be tolerated.

Methods for determining pores on a contact surface are most suitable if they enable their precise location and numbers to be determined. Contact surfaces are often curved or irregular in shape, and test methods should be suitable for them. In addition, the severity of porosity-determining tests may vary. The test method described in this International Standard is regarded as severe.

The relationship of porosity levels revealed by particular tests to contact behavior should be made by the user of these tests through practical experience or by judgement. Thus, absence of porosity in the coating may be a requirement for some applications, while a few pores on the critical surfaces may be acceptable for another. Such acceptance (or pass-fail) criteria should be part of the product specification for the particular product or part requiring the porosity test.

The test method described is highly sensitive and is capable of detecting virtually all porosity or other defects in gold coatings that could participate in substrate corrosion reactions. It is rapid, simple and inexpensive. In addition, it can be used on contacts having complex geometry such as pin-socket contacts. However, it is preferred that deeply recessed sockets are opened to expose their critical surfaces prior to testing.

The test method described is considered destructive in that it reveals the presence of porosity by contaminating the surface with corrosion products and by undercutting the coating at pore sites or at the boundaries of unplated areas. Any parts exposed to these tests should not be placed in service.

The test described involves corrosion reactions in which the products delineate defect sites in coatings. Since the chemistry, and properties of these products may not resemble those found in natural or service environments, these tests are not recommended for prediction of the electrical performance of contacts unless correlation is first established with service experience.

The test method described employs nitric acid (HNO_3) vapour at low relative humidity. Reaction of the gas mixture with a corrodible base metal at pore sites produces reaction products that appear as discrete spots on the gold surface. Individual spots are counted with the aid of a lens or low-power stereomicroscope.

The test method described is intended to be used for quantitative descriptions of porosity (such as number of pores per unit area or per contact) only on coatings that have a pore density sufficiently low that the corrosion sites are well separated and can be readily resolved. As a general guideline this can be achieved for pore densities up to about 100 per square centimetre or per 100 contacts. Above this value the tests are useful for the qualitative detection and comparison of porosity.