

Metallkatted metallpindadel. Galvaani- ja keemilised katted. Ülevaade meetoditest, mida kasutatakse nake määramiseks

Metallic coatings on metallic substrates -
Electrodeposited and chemically deposited coatings
- Review of methods available for testing adhesion

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 2819:1999 sisaldab Euroopa standardi EN ISO 2819:1994 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 12.12.1999 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 2819:1999 consists of the English text of the European standard EN ISO 2819:1994.</p> <p>This document is endorsed on 12.12.1999 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>
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<p>Käsitlusala:</p> <p>Standard kirjeldab galvaani- ja keemiliselt sadestatud katete nakke kontrollimise meetodeid. Standard hõlmab ainult kvalitatiivseid katsemeetodeid. Tabel 2 näitab iga katse sobivust mõnede enamkasutatavate metallkatete jaoks.</p>	<p>Scope:</p>
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Võtmesõnad: adhesioon, adhesioonikatsed, galvaanikatted, katsed, keemiline katmine, kvaliteedi kontroll, mehaanilised katsed, metallkatted

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Descriptors: Metal coatings, metallic materials, electrodeposited coatings, plating, adhesion, testing.

English version

Metallic coatings on metallic substrates

Electrodeposited and chemically deposited coatings

Review of methods available for testing adhesion

(ISO 2819:1980)

Revêtements métalliques sur bases
métalliques; dépôts électrolytiques et
dépôts par voie chimique; liste des
différentes méthodes d'essai
d'adhérence (ISO 2819:1980)

Metallische Überzüge auf metallischen
Grundwerkstoffen; galvanische und
chemische Überzüge; Überblick über
Methoden der Haftfestigkeitsprüfung
(ISO 2819:1980)

This European Standard was approved by CEN on 1994-10-26 and is identical to the ISO Standard as referred to.

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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

International Standard

ISO 2819:1980 Metallic coatings on metallic substrates; electrodeposited and chemically deposited coatings; review of methods available for testing adhesion

which was prepared by ISO/TC 107 'Metallic and other inorganic coatings' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 262 'Protection of metallic materials against corrosion' as a European Standard.

CEN/TC 262 had decided to submit ISO 2819:1980 for Formal Vote. The result was positive.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by April 1995 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of the International Standard ISO 2819:1980 was approved by CEN as a European Standard without any modification.

1 SCOPE AND FIELD OF APPLICATION

This International Standard describes methods of checking the adhesion of electrodeposited and chemically deposited coatings. It is limited to tests of a qualitative nature. Table 2 indicates the suitability of each test for some of the most usual types of metallic coatings. Most of the tests described are capable of destroying both the coating and the article being tested, but some destroy the coating only. Even if the adhesion of the coating is found to be satisfactory on articles not destroyed in testing, it should not be assumed that the articles are undamaged. For example, the burnishing test (see 2.1) may render an article unacceptable and the thermal shock test (see 2.12) may produce unacceptable metallurgical changes.

This International Standard does not describe certain tests which have been developed at various times to give a quantitative measure of adhesion of metallic coating to a substrate since such tests require special apparatus and considerable skill in their performance which renders them unsuitable as quality control tests for production parts. Some of these quantitative tests may, however, be useful in research and development work.

When particular methods of adhesion testing are included in International Standards for individual coatings, they should be used in preference to the methods described in this International Standard and should be agreed upon beforehand by the supplier and the purchaser.

2 METHODS OF TEST

2.1 Burnishing test

If plated parts are subjected to burnishing in a localized area, the deposit will tend to work-harden and absorb frictional heat. If the coating is thin, separation of the coating from the basis metal as blisters will occur under these conditions in areas of poor adhesion.

When the shape and size of the part permit, an area of not more than 6 cm² of the plated surface should be rubbed with a smooth implement for about 15 s. A suitable implement is a steel rod 6 mm in diameter with a smooth hemispherical end.

The pressure shall be sufficient to burnish the coating at every stroke but not so great as to cut the coating. Poor

adhesion is indicated by the appearance of a blister which grows as the rubbing is continued.

If the mechanical properties of the coating are poor, the blister may crack and the coating will peel from the basis metal. This test shall be limited to relatively thin deposits.

2.2 Ball burnishing test

Ball burnishing is frequently used for polishing, but it can be used also to test adhesion. Using a barrel or vibratory burnisher with steel balls about 3 mm in diameter and soap solution as lubricant, it is possible to produce blisters when the adhesion is very poor. The method is suitable for relatively thin deposits.

2.3 Shot peening test

There are some variations of the principle by which the hammering action of iron or steel balls, allowed to fall by gravity or forced by means of a pressure air stream onto the surface to be tested, produces deformation of the deposit.

If the coating is poorly bonded, it will become blistered. Usually, the intensity of peening necessary to cause non-adherent coatings to blister varies with the coating thickness, thin coatings requiring less than thick coatings.

One test can be performed using a tube 150 mm long, 19 mm internal diameter, as the reservoir for round iron or steel shot (0,75 mm diameter approximately) connected to a nozzle. Compressed air is brought to the apparatus with a pressure of 0,07 to 0,21 MPa¹⁾ and the distances between nozzle and specimen are 3 to 12 mm.

Another test, that appears to be the most suitable for checking the adhesion of electroplated coatings of silver during production of coatings from 100 to 600 µm in thickness, is described in the annex and employs a standard air-operated cabinet of the type used for shot-peening steel parts.

If the silver is poorly bonded, it will extend or flow and become blistered.

2.4 Peel test

This test is suitable for coatings less than 125 µm thick on substantially flat surfaces. A strip of tinned mild steel or brass, approximately 75 mm long x 10 mm wide x 0,5 mm thick, is bent at right angles 10 mm from one end and the

1) 1 MPa = 1 MN/m²