SLOVENSKI STANDARD
SIST EN ISO 3892:1999

01-oktober-1999

S fosfatenjem ali kromatenjem nanesene prevleke na kovinskih materialih - Ugotavljanje mase prevleke na enoto površine - Gravimetrijske metode (ISO 3892:1980)

Conversion coatings on metallic materials - Determination of coating mass per unit area - Gravimetric methods (ISO 3892:1980)

Konversionsschichten auf metallischen Werkstoffen - Bestimmung der Masse der Schichten pro Flächeneinheit - Gravimetrische Verfahren (ISO 3892:1980)

Couches de conversion sur matériaux métalliques - Détermination de la masse par unité de surface - Méthodes gravimétriques (ISO 3892:1980)

Ta slovenski standard je istoveten z: **EN ISO 3892:1994**

ICS:

25.220.20 Površinska obdelava Surface treatment

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Descriptors: non metallic coatings, conversion coatings, chromate coatings, phosphate coatings, oxide coatings, anodic coatings, physical tests, density measurement, specific surface

English version

Conversion coatings on metallic materials - Determination of coating mass per unit area - Gravimetric methods (ISO 3892:1980)

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REPUBLIKA SLOVENIJA
MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO
Urad RS za standardizacijo in meroslovje
LJUBLJANA
SIST EN ISO 3892
PREVZET PO METODI RAZGLASITVE -10- 1999

This European Standard was approved by CEN on 1994-10-26. 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.

The European Standards exist 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.

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CEN

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

Central Secretariat: rue de Stassart,36 B-1050 Brussels

Foreword

This European Standard was taken over by the Technical Committee CEN/TC 262 "Protection of metallic materials against corrosion" from the work of ISO/TC 107 "Metallic and other inorganic coatings" of the International Standards Organization (ISO).

CEN/TC 262 had decided to submit the final draft 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, at the latest by April 1995, and conflicting national standards shall be withdrawn at the latest by April 1995.

According to 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, United Kingdom.

Endorsement notice

The text of the International Standard ISO 3892:1980 has been approved by CEN as a European Standard without any modification.

International Standard 3892

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Conversion coatings on metallic materials — Determination of coating mass per unit area — Gravimetric methods

Couches de conversion sur matériaux métalliques — Détermination de la masse par unité de surface — Méthodes gravimétriques

First edition — 1980-09-01

UDC 669.058 : 531.751.3 **Ref. No. ISO 3892-1980 (E)**

Descriptors : non-metallic coatings, conversion coatings, chromate coatings, phosphate coatings, oxide coatings, anodic coatings, physical tests, density measurement, specific surface.

Price based on 3 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3892 was developed by Technical Committee ISO/TC 107, *Metallic and other non-organic coatings*, and was circulated to the member bodies in August 1977.

It has been approved by the member bodies of the following countries :

Australia	India	Romania
Austria	Israel	Spain
Brazil	Italy	Sweden
Czechoslovakia	Japan	Turkey
France	Mexico	United Kingdom
Germany, F. R.	Netherlands	USA
Hungary	Poland	USSR

The member bodies of the following countries expressed disapproval of the document on technical grounds :

South Africa, Rep. of
Switzerland

Printed in Switzerland

Conversion coatings on metallic materials — Determination of coating mass per unit area — Gravimetric methods

1 Scope and field of application

This International Standard specifies gravimetric methods for determining the coating mass per unit area of conversion coatings on metallic materials.

The methods are applicable to

— phosphate coatings on iron and steel;

— phosphate coatings on zinc and cadmium;

— phosphate coatings on aluminium and its alloys;

— chromate coatings on zinc and cadmium;

— chromate coatings on aluminium and its alloys.

The methods are applicable only to conversion coatings which are free from any supplementary coating such as oil, water- or solvent-based polymers, or wax.

2 Apparatus

Ordinary laboratory apparatus and

2.1 Vessel, of glass or other appropriate material, in which the conversion coatings can be dissolved.

2.2 Analytical balance, capable of weighing to a precision of 0,1 mg, for weighing the test pieces under examination before and after dissolution of the conversion coatings.

2.3 Electrical equipment for electrolytic dissolution, in the case of chromate coatings on zinc and cadmium.

3 Test pieces

The test pieces shall have a maximum mass of 200 g and a total surface area large enough to give a loss of mass sufficient to test, with adequate sensitivity, conformity with the requirements of the relevant material or product specification.

In order to achieve an adequate accuracy in the determination, the total surface area shall be in conformity with the following table :

Table — Total surface areas of test pieces

Expected mass of coating per unit area	Minimum total surface area of test piece
g/m^2	cm^2
less than 1	400
1 to 10	200
over 10 to 25	100
over 25 to 50	50
over 50	25

In order to achieve an overall precision (see 5.2) of 5 %, the surface areas should be measured to an accuracy of 1 %.

4 Reagents and procedures

For the preparation of solutions, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

If a sufficient number of test pieces is available, carry out each determination in duplicate or, better, in triplicate.

4.1 Phosphate coatings on iron and steel

4.1.1 Manganese phosphate coatings

4.1.1.1 Reagent

An aqueous solution containing 50 g of chromium(VI) oxide (CrO_3) per litre.

4.1.1.2 Procedure

Dry the test piece (area A) and weigh it on the analytical balance (mass m_1, in milligrams), to the nearest 0,1 mg. Then immerse the test piece for 15 min in the reagent (4.1.1.1), main-

tained at 75 ± 5 °C. Rinse the test piece immediately in clean running water and then in distilled water, dry rapidly and reweigh. Repeat the procedure until a sensibly constant mass is obtained (mass m_2, in milligrams).

Use fresh reagent for every test piece.

4.1.2 Zinc phosphate coatings

4.1.2.1 Reagent

An aqueous solution containing 100 g of sodium hydroxide, 90 g of EDTA tetrasodium salt (ethylenedinitrilo tetraacetic acid, tetrasodium salt dihydrate) and 4 g of triethanolamine per litre.

4.1.2.2 Procedure

Dry the test piece (area A), and weigh it on the analytical balance (mass m_1, in milligrams), to the nearest 0,1 mg. Then immerse the test piece for 5 min in the reagent (4.1.2.1), maintained at 70 ± 5 °C. Rinse the test piece immediately in clean running water and then in distilled water, dry rapidly and reweigh (mass m_2, in milligrams).

Use fresh reagent for every test piece.

4.1.3 Iron phosphate coatings

4.1.3.1 Reagent

An aqueous solution containing 50 g of chromium(VI) oxide (CrO_3) per litre.

4.1.3.2 Procedure

Dry the test piece (area A), and weigh it on the analytical balance (mass m_1, in milligrams), to the nearest 0,1 mg. Then immerse the test piece for 15 min in the reagent (4.1.3.1), maintained at 75 ± 5 °C. Rinse the test piece immediately in clean running water and then in distilled water, dry and reweigh. Repeat the procedure until a sensibly constant mass is obtained (mass m_2, in milligrams).

Use fresh reagent for every test piece.

4.2 Phosphate coatings on zinc and cadmium

4.2.1 Reagent

A solution containing 20 g of ammonium dichromate per litre of 25 to 30 % (m/m) ammonia solution. During the preparation of the solution, its temperature shall not exceed 25 °C.

4.2.2 Procedure

Dry the test piece (area A), and weigh it on the analytical balance (mass m_1, in milligrams), to the nearest 0,1 mg. Then immerse the test piece for 3 to 5 min in the reagent (4.2.1) at room temperature. Carry out this operation in a fume-cupboard. Rinse the test piece immediately in clean running water and then in distilled water, dry rapidly and reweigh (mass m_2, in milligrams).

Use fresh reagent for every test piece.

4.3 Crystalline phosphate coatings on aluminium and its alloys

4.3.1 Reagent

Nitric acid, 65 to 70 % (m/m) solution.

4.3.2 Procedure

Dry the test piece (area A), and weigh it on the analytical balance (mass m_1, in milligrams), to the nearest 0,1 mg. Then immerse the test piece either for 5 min in the reagent (4.3.1) maintained at 75 ± 5 °C or for 15 min in the same reagent at room temperature. Rinse the test piece immediately in clean running water and then in distilled water, dry rapidly and reweigh (mass m_2, in milligrams).

Use fresh reagent for every test piece.

4.4 Chromate coatings on zinc and cadmium

4.4.1 Reagent

An aqueous solution containing 50 g of sodium (or potassium) cyanide and 5 g of sodium hydroxide per litre.

4.4.2 Procedure

Dry the test piece (area A), aged naturally after application of the chromate coating for at least 24 h and not more than 14 days, and weigh it on the analytical balance (mass m_1, in milligrams), to the nearest 0,1 mg. Then immerse the test piece for approximately 1 min in the reagent (4.4.1) at room temperature and dissolve the coating under electrolytic conditions with the test piece as the cathode. The anode shall be made from an insoluble material, for instance graphite. Immerse the test piece in the reagent, and withdraw it, while the current is flowing. Use a cathodic current density of 15 A/dm^2. When the coating has been dissolved (after approximately 1 min), withdraw the test piece from the reagent, rinse it immediately in clean running water and then in distilled water, and then dry it rapidly and reweigh (mass m_2, in milligrams).

Use fresh reagent for every test piece.

4.5 Chromate and amorphous phosphate coatings on aluminium and its alloys

4.5.1 Fresh coatings (aged not longer than 3 h) dried below 70 °C.

4.5.1.1 Reagent

A solution containing 1 part by volume of 65 to 70 % (m/m) nitric acid solution, and 1 part by volume of water.