



# SLOVENSKI STANDARD SIST EN ISO 4518:1999

01-oktober-1999

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**Kovinske prevleke - Merjenje debeline prevleke - Profilometrijska metoda (ISO 4518:1980)**

Metallic coatings - Measurement of coating thickness - Profilometric method (ISO 4518:1980)

Metallische Überzüge - Messen der Schichtdicke - Profilometrisches Verfahren (ISO 4518:1980)

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Revetements métalliques - Mesurage profilométrique (ISO 4518:1980)

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**Ta slovenski standard je istoveten z: EN ISO 4518:1995**

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**ICS:**

17.040.20	Lastnosti površin	Properties of surfaces
25.220.40	Kovinske prevleke	Metallic coatings

**SIST EN ISO 4518:1999**

**en**

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EUROPEAN STANDARD

EN ISO 4518

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 1995

ICS 25.220.40

Descriptors: Metal coatings, dimensional measurements, thickness, measuring instruments, profile meters

English version

**Metallic coatings - Measurement of coating  
thickness - Profilometric method (ISO 4518:1990)**

Revêtements métalliques  
profilométrique (ISO 4518:1990)

Mesurage

Metallische Überzüge - Messen der Schichtdicke  
- Profilometrisches Verfahren (ISO 4518:1990)

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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.

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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

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Ref. No. EN ISO 4518:1995 E

## Foreword

This European Standard has been 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 Organization for Standardization (ISO).

This document was submitted to the formal vote and was adopted by CEN as a European Standard.

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of an identical text or by endorsement, at the latest by July 1995, and conflicting national standards shall be withdrawn at the latest by July 1995.

In accordance with the CEN/CENELEC Internal Regulations, 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.

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**Endorsement notice**

The text of the International Standard ISO 4518:1990 has been approved by CEN as a European Standard without any modification.



**Annex ZA (normative)****Normative references to international publications  
with their relevant European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 2064	1980	Metallic and other non-organic coatings - Definitions and conventions concerning the measurement of thickness	EN ISO 2064	1994
ISO 2177	1985	Metallic coatings - Measurement of coating thickness - Coulometric method by anodic dissolution	EN ISO 2177	1994

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International Standard



4518

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

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**Metallic coatings — Measurement of coating thickness —  
Profilometric method**

*Revêtements métalliques — Mesurage de l'épaisseur — Méthode profilométrique*

First edition — 1980-07-15

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UDC 669.058 : 531.717

Ref. No. ISO 4518-1980 (E)

**Descriptors** : metal coatings, dimensional measurement, thickness, measuring instruments, profile meters.

## 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 4518 was developed by Technical Committee ISO/TC 107, *Metallic and other non-organic coatings*, and was circulated to the member bodies in June 1978.

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

Czechoslovakia	Italy	Switzerland
France	Mexico	Turkey
Germany, F. R.	New Zealand	United Kingdom
Hungary	Poland	USA
India	Romania	USSR
Ireland	South Africa, Rep. of	
Israel	Sweden	

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

Japan  
Netherlands



# Metallic coatings — Measurement of coating thickness — Profilometric method

## 1 Scope and field of application

**1.1** This International Standard specifies a method for the measurement of metal coating thickness by first forming a step between the surface of the coating and the surface of its substrate and then measuring the step height using a profile recording instrument. It covers the instrumentation characteristics and the procedure appropriate to this specific application of profilometric methods.

**1.2** The method is applicable to the measurement of thicknesses of metal coatings from 0,01  $\mu\text{m}$  to 1 000  $\mu\text{m}$  on flat surfaces and, if appropriate precautions are taken, on cylindrical surfaces. It is highly suitable for the measurement of minute thicknesses but, for thicknesses of less than 0,01  $\mu\text{m}$ , surface flatness and surface smoothness are very critical and accordingly, the method is not recommended for use down to the lowest level of measurement usual for electronic stylus instruments. The method is suitable for measuring coating thicknesses when preparing coating thickness reference standards.

## 2 References

ISO 2064, *Metallic and other non-organic coatings — Definitions and conventions concerning the measurement of thickness.*

ISO 2177, *Metallic coatings — Measurement of coating thickness — Coulometric method by anodic dissolution.*

## 3 Principle

Formation of a step either by dissolving part of the coating (acceptance testing) or by masking a portion of the substrate prior to coating (production inspection). Measurement of the height of the step using a profile recording instrument.

## 4 Instrumentation : Operational parameters and measurement characteristics

### 4.1 Types of profile recording instruments

Either of two types may be used :

a) electronic stylus instruments, known as surface analysers and surface profile recorders, generally used to

measure surface roughness but which, for the purposes of this International Standard, are used to record the profile of a step;

b) electronic inductive comparators equipped with styli and capable of recording the profile of a step.

Electronic stylus instruments may have a greater utility, being suitable for roughness measurements, while electronic inductive comparators may be simpler in construction. The two types of instrument generally cover different ranges of coating thickness : 0,005 to 250  $\mu\text{m}$  for electronic stylus instruments, and 1 to 1 000  $\mu\text{m}$  for electronic inductive comparators.

### 4.2 Electronic stylus instruments

**4.2.1** These instruments are used to record the profile of a surface and have the following components.

**4.2.1.1** A pick-up with a conical or pyramidal stylus having an included angle of 1,57 rad ( $90^\circ$ ) and a nominal tip radius, in the direction of the traverse, of 2, 5, 10 or 50  $\mu\text{m}$ . The force of contact on the test surface shall not exceed the appropriate value given in the table.

Table — Force on stylus

Nominal value of stylus tip radius, $\mu\text{m}$	2	5	10	50**
Maximum static force at the mean level of the stylus, mN*	0,7	4	16	10**

\* 1 mN  $\approx$  0,1 gf

\*\* Values useful for low-hardness metals such as tin and lead.

**4.2.1.2** A traverse unit that moves the pick-up relative to a datum skid or, in those cases where the skid may result in damage to the surface or introduce distortion of the step to be measured, a datum surface having nominal form of the profile.

**4.2.1.3** An amplifying unit giving nominal values of the vertical ( $V_v$ ) magnifications of the profile selected from the following series :

100 — 200 — 500 — 1 000 — 2 000 — 5 000 — 10 000 — 20 000 — 50 000 — 100 000 — 200 000 — 500 000 — 1 000 000.