

**Metallkatted. Katte paksuse mõõtmine.  
Profilomeetriameetod**

Metallic coatings - Measurement of coating  
thickness - Profilometric method

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 4518:1999 sisaldab Euroopa standardi EN ISO 4518:1995 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 4518:1999 consists of the English text of the European standard EN ISO 4518:1995.</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><b>Käsitlusala:</b> Standard määrab kindlaks metallkatte mõõtmise meetodi profiili registreeriva instrumendiga.</p>	<p><b>Scope:</b></p>
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**ICS** 17.040.20

**Võtmesõnad:** metallkatted, mõõteriistad, mõõtmete määramine, paksus, profilomeetrid

ICS 25.220.40

Descriptors: Coatings, metal coatings, coating thickness, testing.

**English version**

**Metallic coatings**

Measurement of coating thickness

Profilometric method

(ISO 4518:1980)

Revêtements métalliques; mesurage de  
l'épaisseur; méthode profilométrique  
(ISO 4518:1980)

Metallische Überzüge; Messen der  
Schichtdicke; profilometrisches Verfahren  
(ISO 4518:1980)

This European Standard was approved by CEN on 1994-10-03 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

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

## Foreword

International Standard

ISO 4518:1980 Metallic coatings; measurement of coating thickness; profilometric method

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.

This document was submitted for Formal Vote and adopted 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, and conflicting national standards withdrawn, by July 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 4518:1980 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

## 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°) 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.