Thickness measurement of coatings and characterization of surfaces with surface waves - Part 1: Guide to the determination of elastic constants, density and thickness of films by laser induced surface acoustic waves

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EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 15042-1:2006 sisaldab Euroopa standardi EN 15042-1:2006 ingliskeelset teksti. Käesolev dokument on jõustatud 29.05.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 15042-1:2006 consists of the English text of the European standard EN 15042-1:2006. This document is endorsed on 29.05.2006 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This document gives guidance on methods of determining the elastic constants, density and thickness of thin films by laser-induced surface acoustic waves. It defines terms and described procedures.	**Scope:** This document gives guidance on methods of determining the elastic constants, density and thickness of thin films by laser-induced surface acoustic waves. It defines terms and described procedures.

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Thickness measurement of coatings and characterization of surfaces with surface waves - Part 1: Guide to the determination of elastic constants, density and thickness of films by laser induced surface acoustic waves

Mesure de l'épaisseur des revêtements et caractérisation des surfaces à l'aide d'ondes de surface - Partie 1 : Guide pour la détermination des constantes élastiques, de la masse volumique et de l'épaisseur des films à l'aide d'ondes acoustiques de surface générées par laser

Schichtdickenmessung und Charakterisierung von Oberflächen mittels Oberflächenwellen - Teil 1: Leitfaden zur Bestimmung von elastischen Konstanten, Dichte und Dicke von Schichten mittels laserinduzierten Ultraschall-Oberflächenwellen

This European Standard was approved by CEN on 2 March 2006.

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

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Foreword

This document (EN 15042-1:2006) has been prepared 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 2006, and conflicting national standards shall be withdrawn at the latest by October 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This document gives guidance on methods of determining the elastic constants, density and thickness of thin films by laser-induced surface acoustic waves.

It defines terms and described procedures.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 11145:2001, *Optics and optical instruments — Laser and laser-related equipment — Vocabulary and symbols* (ISO 11145:2001)

International Vocabulary of Basic and General Terms in Metrology, 2nd Edition 1994, Beuth Verlag GmbH Berlin Wien Zürich

3 Terms and definitions

For the purposes of this document, the terms and definitions given in the International Dictionary of Metrology (VIM), EN ISO 11145:2001 and the following apply.

3.1
surface acoustic waves
ultrasonic wave propagating along the surface of the material

NOTE An important property of this wave is the penetration depth into the material, which depends on frequency.

3.2
phase velocity
velocity at which the phase of the wave propagates

3.3
group velocity
velocity at which the surface acoustic wave impulse induced by the laser propagates

3.4
dispersion
dependence of the phase velocity on the frequency of the wave

3.5
dispersion relation
ratio of angular frequency to the amount of the wave vector (wave number)

3.6
dispersion degree
difference between phase and group velocity

NOTE The dispersion degree is expressed as a percentage.

3.7
bandwidth
frequency range of the amplitude spectrum