Paints and varnishes - Determination of hiding power - Part 1: Kubelka-Munk method for white and light-coloured paints (ISO 6504-1:2019)

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EESTI STANDARDI EESSÕNA   NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 6504-1:2019 sisaldab Euroopa standardi EN ISO 6504-1:2019 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 6504-1:2019 consists of the English text of the European standard EN ISO 6504-1:2019.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 12.06.2019.	Date of Availability of the European standard is 12.06.2019.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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EUROPEAN STANDARD

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English Version

Paints and varnishes - Determination of hiding power - Part 1: Kubelka-Munk method for white and light-coloured paints (ISO 6504-1:2019)

Peintures et vernis - Détermination du pouvoir masquant - Partie 1: Méthode de Kubelka-Munk pour les peintures blanches et les peintures claires (ISO 6504-1:2019)

Beschichtungsstoffe - Bestimmung des Deckvermögens - Teil 1: Verfahren nach Kubelka-Munk für weiße und helle Beschichtungen (ISO 6504-1:2019)

This European Standard was approved by CEN on 13 May 2019.

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

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European foreword

This document (EN ISO 6504-1:2019) has been prepared by Technical Committee ISO/TC 35 "Paints and varnishes" in collaboration with Technical Committee CEN/TC 139 "Paints and varnishes" the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by December 2019, and conflicting national standards shall be withdrawn at the latest by December 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 6504-1:2006.

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

Endorsement notice

The text of ISO 6504-1:2019 has been approved by CEN as EN ISO 6504-1:2019 without any modification.

Contents

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test method for paints and varnishes.*

This second edition cancels and replaces the first edition (ISO 6504-1:1983), which has been technically revised. The main changes compared to the previous edition are as follows:

a)   the normative references in Clause 2 have been updated;

b)   Clause 3 for terms and definitions has been added;

c)   Clause 7 for limitations has been added;

d)   the term "contrast ratio" has been changed to "hiding power" throughout the text;

e)   it has been clarified that the reflectance R_g needs to be measured and that the graphs in Annex A and values in Table B.1 are only examples for $R_g = 0,80$.

A list of all parts in the ISO 6504 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

ISO 6504-3[1] specifies a method for determining the hiding power of paints at a fixed spreading rate, by applying paint films to black and white charts and to polyester film respectively. It depends on the observation that there is a linear relationship between hiding power and reciprocal film thickness, at least over a limited range of film thickness.

Hiding power of paints is generally defined as the spreading rate required to give a hiding power of 98 %. To determine this by the method specified in ISO 6504-3[1] would be time-consuming and require considerable extrapolation which often exceeds the limit of linearity of the relationship between hiding power and spreading rate. Therefore, this method for the determination of hiding power, involving the Kubelka-Munk (K-M) equations which relate scattering and absorption coefficients to optical properties, has also been standardized.

Paints and varnishes — Determination of hiding power —

Part 1:
Kubelka-Munk method for white and light-coloured paints

1 Scope

This document specifies a method for determining the hiding power (spreading rate necessary to give a hiding power of 98 %) of white or light-coloured paints. It is applicable to paint films having the tri-stimulus value of $Y \geq 70$ and hiding power > 80 %. It is not applicable to fluorescent or metallic paints.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 1513, *Paints and varnishes — Examination and preparation of test samples*

ISO 2808, *Paints and varnishes — Determination of film thickness*

ISO 2811-1, *Paints and varnishes — Determination of density — Part 1: Pycnometer method*

ISO 3251, *Paints, varnishes and plastics — Determination of non-volatile-matter content*

ISO 4618, *Paints and varnishes — Terms and definitions*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
light-coloured paint
coating with tristimulus values Y and Y_{10} greater than 25, measured with a spectrophotometer on a black and white substrate

4 Principle

The method is based on the Kubelka and Munk equations relating the scattering and absorption coefficients of pigmented films to their colour and opacity.

For the determination of hiding power, both the reflectance (R_B) of a paint film of thickness t on a black background and the reflectivity (R_∞) are required for introduction into the Kubelka-Munk equations (Clause 5).