

**SLOVENSKI STANDARD**  
**oSIST prEN ISO 6504-3:2018**  
**01-november-2018**

---

**Barve in laki - Ugotavljanje kritnosti - 3. del: Ugotavljanje kritnosti barv za mineralne podlage in beton (ISO/DIS 6504-3:2018)**

Paints and varnishes - Determination of hiding power - Part 3: Determination of hiding power of paints for masonry and concrete (ISO/DIS 6504-3:2018)

Beschichtungsstoffe - Bestimmung des Deckvermögens - Teil 3: Bestimmung des Deckvermögens von Beschichtungen für mineralische Untergründe und Beton (ISO/DIS 6504-3:2018)

Peintures et vernis - Détermination du pouvoir masquant - Partie 3: Détermination du pouvoir masquant pour des peintures bâtiments et béton (ISO/DIS 6504-3:2018)

**Ta slovenski standard je istoveten z: prEN ISO 6504-3**

---

**ICS:**

87.040

Barve in laki

Paints and varnishes

**oSIST prEN ISO 6504-3:2018**

**en,fr,de**



# DRAFT INTERNATIONAL STANDARD

## ISO/DIS 6504-3

ISO/TC 35/SC 9

Secretariat: BSI

Voting begins on:  
2018-09-11Voting terminates on:  
2018-12-04

## Paints and varnishes — Determination of hiding power —

### Part 3: Determination of hiding power of paints for masonry and concrete

*Peintures et vernis — Détermination du pouvoir masquant —**Partie 3: Détermination du pouvoir masquant pour des peintures bâtiments et béton*

ICS: 87.040

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

SIST EN ISO 6504-3:2020

<https://standards.iteh.ai/catalog/standards/sist/3d0a7ddf-7abd-4020-b5da-e7e138c25873/sist-en-iso-6504-3-2020>

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

This document is circulated as received from the committee secretariat.

## ISO/CEN PARALLEL PROCESSING



Reference number  
ISO/DIS 6504-3:2018(E)

© ISO 2018

# iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 6504-3:2020

<https://standards.iteh.ai/catalog/standards/sist/3d0a7ddf-7abd-4020-b5da-e7e138c25873/sist-en-iso-6504-3-2020>



## **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

Foreword.....	iv
Introduction.....	v
<b>1 Scope.....</b>	<b>1</b>
<b>2 Normative references.....</b>	<b>1</b>
<b>3 Terms and definitions.....</b>	<b>1</b>
<b>4 Symbols and abbreviated terms.....</b>	<b>2</b>
<b>5 Principle.....</b>	<b>4</b>
<b>6 Apparatus.....</b>	<b>4</b>
<b>7 Sampling.....</b>	<b>6</b>
<b>8 Procedure and calculation.....</b>	<b>7</b>
8.1 Preparation of substrate.....	7
8.1.1 Method A (foil).....	7
8.1.2 Method B and Method C (black and white charts).....	7
8.2 Preparation of coated foils or black and white charts.....	7
8.3 Determination of the spreading rate of the test specimen.....	7
8.3.1 Calculation of the surface mass density.....	7
8.3.2 Determination of the density.....	9
8.3.3 Determination of the non-volatile matter.....	9
8.3.4 Calculation of the theoretical dry- or wet-film thickness (Method A, Method B and Method C).....	9
8.3.5 Calculation 1 – Determination of the theoretical spreading rate by calculation from the non-volatile matter content determined in accordance with ISO 3251 and the density of the coating material (see ISO 3233-3) (Method A and Method B).....	10
8.3.6 Calculation 2 – Determination of the theoretical spreading rate calculated with the different coated mass on the two charts (Method C), the density of the coating material according to ISO 2811 (all parts) and the coated area.....	12
8.4 Measurement of tristimulus value $Y_{10}$ and calculation of the hiding power $H_{10}$ .....	13
8.4.1 General.....	13
8.4.2 Method A (foil).....	13
8.4.3 Method B (black and white charts).....	13
8.4.4 Method C (black and white charts).....	13
8.5 Graphical method for determination of the hiding power at a given spreading rate (Method C).....	14
8.5.1 General.....	14
8.5.2 Determination by graphical method.....	14
8.5.3 Determination by calculation with a known slope.....	15
<b>9 Designation of the test result.....</b>	<b>16</b>
<b>10 Precision.....</b>	<b>17</b>
10.1 Repeatability ( $r$ ).....	17
10.2 Reproducibility ( $R$ ).....	17
<b>11 Test report.....</b>	<b>17</b>
<b>Bibliography.....</b>	<b>19</b>

## ISO/DIS 6504-3:2018(E)

## 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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

For an explanation on 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 the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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

This third edition cancels and replaces the second edition (ISO 6504-3:2006), which has been technically revised.

The main changes compared to the previous edition are as follows:

- the title and scope have been restricted to paints for masonry and concrete;
- a definition for light-coloured coating has been added;
- a new method (Method C) has been introduced which is suitable for waterborne coatings only
- the determination of the mass per unit area of the dry coating and the determination of the practical spreading rate have been deleted because ISO 3233-3 can be used instead;
- the reference to a fixed spreading rate has been deleted from the foreword, scope and test report, as it had already been deleted from the procedure in the previous revision;
- the precision values for methods A and B have been recalculated from data taken from the round robin test conducted in 1972;
- the normative references have been updated.

A list of all parts in the ISO 6504, *Paints and varnishes — Determination of hiding power*, series can be found on the ISO website.

## Introduction

Two techniques are available for substrate preparation and measurement when determining the hiding power of paints:

- a) application to colourless, transparent foil, the coated foil being subsequently placed in turn over black and white panels;
- b) direct application to black and white charts.

The spreading rate is important for the determination of the hiding power ratio. The spreading rate can be either determined according to ISO 3233-3 or according to another simplified method described in these standards, applicable for coatings for interior walls and ceilings as specified in EN 13300.

Because different operators using the same draw-down device will obtain coatings differing significantly in thickness, an absolute method for the determination of opacity is required. Collaborative trials between groups of experts from a number of countries have shown that reproducible results can be obtained by determination of the hiding power corresponding to a precisely specified spreading rate by interpolation between measurements at two or more measured coating thicknesses nearby and enclosing the specified spreading rate. The interested parties may agree on the specified spreading rate.

The methods are based on the observation that hiding power is an approximately linear function of reciprocal spreading rate, over a restricted coating thickness range which also corresponds to that used for normal application of white or light-coloured paints. It is thus possible to interpolate graphically or by computation, with satisfactory accuracy, between results obtained with coatings of different thicknesses.

(standards.iteh.ai)

SIST EN ISO 6504-3:2020

<https://standards.iteh.ai/catalog/standards/sist/3d0a7ddf-7abd-4020-b5da-e7e138c25873/sist-en-iso-6504-3-2020>





# Paints and varnishes — Determination of hiding power —

## Part 3:

## Determination of hiding power of paints for masonry and concrete

### 1 Scope

This document (ISO 6504-3) specifies methods for determining the hiding power given by paint coats of white or light colours of tristimulus values  $Y$  and  $Y_{10}$  greater than 25, applied to a black and white chart, or to a colourless transparent foil. In the latter case the tristimulus values  $Y$  and  $Y_{10}$  are measured over black and white panels. Subsequently, the hiding power is calculated from these tristimulus values.

This document specifies also a simple method for calculating the spreading rate for paints with a volatile matter content with low evaporation speed, e.g. coatings for interior walls and ceilings as specified in EN 13300.

### 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 2811 (all parts), *Paints and varnishes — Determination of density*

ISO 3233-3:2015, *Paints and varnishes — Determination of the percentage volume of non-volatile matter — Part 3: Determination by calculation from the non-volatile-matter content determined in accordance with ISO 3251, the density of the coating material and the density of the solvent in the coating material*

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

ISO 4618:2014, *Paints and varnishes — Terms and definitions*

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

EN 13300, *Paints and varnishes — Water-borne coating materials and coating systems for interior walls and ceilings — Classification*

### 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 <http://www.iso.org/obp>

#### 3.1

##### light-coloured coating

coating with tristimulus values  $Y$  and  $Y_{10}$  greater than 25, measured with a spectrophotometer on a black and white substrate

## ISO/DIS 6504-3:2018(E)

### 3.2

#### **spreading rate**

surface area that can be covered by a given quantity of coating material to give a dried film of requisite thickness

Note 1 to entry: It is expressed in  $\text{m}^2/\text{l}$  or  $\text{m}^2/\text{kg}$ .

Note 2 to entry: See also application rate, practical spreading rate and theoretical spreading rate.

[SOURCE: ISO 4618:2014, definition 2.238]

### 3.3

#### **practical spreading rate**

spreading rate which is obtained in practice on the particular substrate being coated

[SOURCE: ISO 4618:2014, definition 2.203]

### 3.4

#### **theoretical spreading rate**

spreading rate calculated solely from the volume of non-volatile matter

[SOURCE: ISO 4618:2014, definition 2.256]

### 3.5

#### **hiding power**

ability of a coating to obliterate the colour or colour differences of the substrate

Note 1 to entry: The use of the German expressions "Deckkraft" und "Deckfähigkeit" should be avoided.

Note 2 to entry: The term "coverage" is ambiguous because it is used in some instances to refer to hiding power and in others to mean spreading rate. The more precise terms hiding power and spreading rate should always be used.

[SOURCE: ISO 4618:2014, definition 2.138]

### 3.6

#### **tristimulus values (of a colour stimulus)** see ILV 845-03-22

amounts of the three reference stimuli, in a given trichromatic system, required to match the colour of the stimulus considered

Note 1 to entry: In the CIE standard colorimetric systems, the tristimulus values are represented by the symbols  $X$ ,  $Y$ ,  $Z$  and  $X_{10}$ ,  $Y_{10}$ ,  $Z_{10}$

[SOURCE: ISO 11664-2:2008, definition 3.14]

## 4 Symbols and abbreviated terms

$A_c$	dry area of the coated charts of the part cut out in each case
$A_f$	dry area of the coated foils of the part cut out in each case
$A_n$	area of the part of the foil or charts cut out in each case
$A_{wc}$	wet area of the coated charts of the part cut out in each case
$H_{10cl}$	hiding power for the chart with the low coating thickness
$H_{10ch}$	hiding power for the chart with the high coating thickness
$m$	slope of the straight line

$\bar{m}_c$	mean value of the dry mass of the coated two charts
$\bar{m}_f$	mean value of the mass of the coated two foils
$\bar{m}_{uf}$	mean value of the mass of the uncoated two foils
$m_{uc}$	mass of the uncoated chart
$\bar{m}_{wc}$	mean value of the wet mass of the coated two charts
$m_{wch}$	is the wet mass of the high wet-film thickness on the chart
$m_{wcl}$	wet mass of the low wet-film thickness on the chart
$n$	interception of the y-axis at the point zero of the x-axis, $P(0,n)$
NV	non-volatile matter content of the coating material
$NV_w$	is the non-volatile-matter content of the wet coating
$\rho_{Ac}$	surface mass density of the dry coated charts
$\rho_{Af}$	surface mass density of the dry coated foil
$\rho_{An}$	surface mass density of the dry foils ( $A_f$ ) or dry charts ( $A_c$ ) or wet charts ( $A_{wc}$ )
$\rho_{Awc}$	surface mass density of the wet coated chart
$\rho_{Awch}$	surface mass density of the wet coat with the high wet-film thickness
$\rho_{Awcl}$	surface mass density of the wet coat with the low wet-film thickness
$\rho_1$	density of the coating material
$S_{tAVg}$	given theoretical spreading rate
$S_{tAVh}$	theoretical spreading rate for the chart with the high coating thickness
$S_{tAVl}$	theoretical spreading rate for the chart with the low coating thickness
$s_{tcm}$	theoretical spreading rate dry coating on charts relative to the mass
$s_{tcV}$	theoretical spreading rate of the dry coating on charts relative to the volume
$s_{tfm}$	theoretical spreading rate of dry coating on foils relative to the mass
$s_{tfV}$	theoretical spreading rate of the dry coating on foils relative to the volume
$t_d$	theoretical dry-film thickness
$t_{tc}$	theoretical dry film thickness of the coating on charts
$t_{tf}$	theoretical dry film thickness of the coating on foils
$t_{tm}$	theoretical dry film thickness of the coating on foils ( $t_{tf}$ ) or charts ( $t_{tc}$ )
$t_w$	theoretical wet-film thickness
$t_{wl}$	theoretical low wet-film thickness