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Second edition
2006-02-15

Paints and varnishes — Determination of hiding power —

Part 3:

Determination of contrast ratio of light-coloured paints at a fixed spreading rate

Peintures et vernis — Détermination du pouvoir masquant —

Partie 3: Détermination du rapport de contraste des peintures claires à un rendement surfacique déterminé



Reference number
ISO 6504-3:2006(E)

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Published in Switzerland

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 6504-3 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

This second edition cancels and replaces the first edition (ISO 6504-3:1998), which has been technically revised.

The main technical changes are:

- a) the unit of density of the wet coating material, used in Equation (3) in 7.6.2, has been corrected;
- b) the surface density (ρ_A) has been changed to mass per unit area of the dry coating (m'').

The opportunity has also been taken to revise the text editorially.

ISO 6504 consists of the following parts, under the general title *Paints and varnishes — Determination of hiding power*:

- *Part 1: Kubelka-Munk method for white and light-coloured paints*
- *Part 3: Determination of contrast ratio of light-coloured paints at a fixed spreading rate*

The subject originally intended to be covered by Part 2 is currently covered by ISO 2814, *Paints and varnishes — Comparison of contrast ratio (hiding power) of paints of the same type and colour*.

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Introduction

Two techniques are available for test film preparation and measurement when determining the contrast ratio of paints:

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

Because different operators using the same draw-down device will obtain paint films 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 contrast ratio corresponding to a precisely fixed spreading rate by interpolation between measurements at two or more measured film thicknesses. The spreading rate selected in this part of ISO 6504 is 20 m²/l (wet film thickness 50 µm), which is considered to be an average for brush application of a free-flowing paint on a smooth, non-porous surface. However, for particular types of paint normally used at other film thickness ranges, for example industrial enamels and printing inks, the interested parties may agree on another spreading rate.

Further collaborative trials have indicated that higher reproducibility is obtained with films spread on polyester foil than with films spread on a black and white chart, although the latter technique is simpler to operate. This part of ISO 6504 provides for both these options.

The methods are based on the observation that contrast ratio is an approximately linear function of reciprocal spreading rate, over a restricted film 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 films of different thicknesses.

Because the wet film thickness is not always determined directly, the methods specified in this part of ISO 6504 involve the determination of dry film mass per unit area and calculation of the corresponding wet film thickness. In this latter calculation, values for wet paint density and percentage of non-volatile-matter content are required. Determination of these values by the methods specified in the relevant International Standards has been stipulated. However, it is recognized that, for certain types of paint, the non-volatile-matter determination in accordance with ISO 3251 does not correspond exactly to the mass changes in a film during drying under the conditions of the present test method. Any errors introduced into results by this discrepancy should be common to all laboratories, however, and should not affect comparisons of paints of similar types.

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