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STANDARD

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JIS K 5600-4-4 : 1999

(ISO 7724-1 : 1984)

**Testing methods for paints—
Part 4 : Visual characteristics
of film—
Section 4 : Colorimetry (Principles)**

ICS 87.040

Descriptors : paints, painting, membranes, visual perception, colorimetry, colorimetric characteristics, colour tests

Reference number : JIS K 5600-4-4 : 1999 (E)

K 5600-4-4 : 1999 (ISO 7724-1 : 1984)

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law.

JIS K 5400 corresponding to this Standard will be withdrawn and replaced with this Standard in April 2002, at the time of three years passed after establishment of this Standard.

Consequently it is recommended to comply with this Standard.

JIS K 5600 consists of the following parts.

JIS K 5600 Part 1 Section 1 to Section 8	<i>General rule</i>
JIS K 5600 Part 2 Section 1 to Section 7	<i>Characteristics and stability of paints</i>
JIS K 5600 Part 3 Section 1 to Section 6	<i>Film formability</i>
JIS K 5600 Part 4 Section 1 to Section 7	<i>Visual characteristics of film</i>
JIS K 5600 Part 5 Section 1 to Section 11	<i>Mechanical property of film</i>
JIS K 5600 Part 6 Section 1 to Section 3	<i>Chemical property of film</i>
JIS K 5600 Part 7 Section 1 to Section 8	<i>Long-period performance of film</i>
JIS K 5600 Part 8 Section 1 to Section 6	<i>Evaluation of degradation of paint coatings</i>

JIS K 5600-4 consists of the following sections under the title of "Testing methods for paints—Part 4 : Visual characteristics of film".

JIS K 5600 Part 4 Section 1	<i>Hiding power (for light-coloured paints)</i>
JIS K 5600 Part 4 Section 2	<i>Hiding power (for dark-coloured paints)</i>
JIS K 5600 Part 4 Section 3	<i>Visual comparison of the colour of paints</i>
JIS K 5600 Part 4 Section 4	<i>Colorimetry (Principles)</i>
JIS K 5600 Part 4 Section 5	<i>Colorimetry (Measurement)</i>
JIS K 5600 Part 4 Section 6	<i>Colorimetry (Calculation of colour differences)</i>
JIS K 5600 Part 4 Section 7	<i>Specular gloss</i>

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Testing methods for paints— Part 4 : Visual characteristics of film— Section 4 : Colorimetry (Principles)

Introduction This Japanese Industrial Standard has been prepared based on ISO 7724-1 : 1984 *Paints and varnishes—Colorimetry—Part 1 : Principles*, without changing the technical contents.

The portions underlined with dots in this Standard are not stated in the original International Standard.

The specifications for colorimetry consist of the following three sections.

JIS K 5600-4-4 *Testing methods for paints—Part 4 : Visual characteristics of film—Section 4 : Colorimetry (Principles)*

JIS K 5600-4-5 *Testing methods for paints—Part 4 : Visual characteristics of film—Section 5 : Colorimetry (Measurement)*

JIS K 5600-4-6 *Testing methods for paints—Part 4 : Visual characteristics of film—Section 6 : Colorimetry (Calculation of colour differences)*

JIS K 5600-4-4, JIS K 5600-4-5 and JIS K 5600-4-6 describe methods for the instrumental determination of the colour co-ordinates and colour differences of paint films, as required for such purposes as

- a) the objective description of colour differences between a test specimen (a test panel coated with a paint, or a specimen from a painted article) and a reference specimen;
- b) determining colour deviations in the production of painted articles so that the results may be used for the control or regulation of the process;
- c) the objective description of changes in colour caused by weathering and other chemical or physical influences;
- d) the objective supervision of colour reference standards.

Note : Colour reference standards are subject to ageing, which may lead in the course of time to pronounced changes in colour. High accuracy colorimetry is required for the timely detection of these changes. This is of particular importance when ordering against such reference standards.

1 Scope This Japanese Industrial Standard describes the colorimetric terms and fundamental requirements necessary for determining the colour co-ordinates of paint films and related materials.

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. If the indication of the year of coming into effect is given to these referred standards, only the edition of indicated year constitutes the provision of this Standard but the revision and amendment made thereafter are not applied. The normative references without the indication of the year of coming into effect apply limiting only to the most recent edition (including the amendment).

JIS K 5600-4-3 Testing methods for paints—Part 4 : Visual characteristics of film—
Section 3 : Visual comparison of the colour of paints

Remarks : **ISO/FDIS 3668 : 1998** *Paints and varnishes—Visual comparison of the colour of paints* is identical with the said standard.

JIS K 5600-4-5 Testing methods for paints—Part 4 : Visual characteristics of film—
Section 5 : Colorimetry (Measurement)

Remarks : **ISO 7724-2 : 1984** *Paints and varnishes—Colorimetry—Part 2 : Colour measurement* is identical with the said standard.

JIS K 5600-4-6 Testing methods for paints—Part 4 : Visual characteristics of film—
Section 6 : Colorimetry (Calculation of colour differences)

Remarks : **ISO 7724-3 : 1984** *Paints and varnishes—Colorimetry—Part 3 : Calculation of colour differences* is identical with the said standard.

JIS K 5600-4-7 Testing methods for paints—Part 4 : Visual characteristics of film—
Section 7 : Specular gloss

Remarks : **ISO 2813 : 1994** *Paints and varnishes—Determination of specular gloss of non-metallic paint films at 20 degrees, 60 degrees and 85 degrees* is identical with the said standard.

CIE Publication No. 15 *Colorimetry, Official CIE Recommendations*

CIE Publication No. 15 *Supplement No. 2, Recommendations on uniform color spaces—Color difference equations—Psychometric color terms*

CIE Publication No. 38 *Radiometric and photometric characteristics of materials and measurement*

3 Colour co-ordinates A colour is uniquely characterized for a defined observer and a defined light source by the co-ordinates of a point in a space formed by three mutually perpendicular vectors. From among the various colour co-ordinates recommended by the Commission Internationale de l'Éclairage (CIE), the colour co-ordinates given in 3.1 and 3.2 are specified for colorimetric measurements on paint films in accordance with this International Standard.

3.1 Colour co-ordinates in the CIE 1964 supplementary standard colorimetric system The colour co-ordinates in this system (see **CIE Publication No. 15**) are the tristimulus value Y_{10} and the chromaticity co-ordinates x_{10} and y_{10} .

$$Y_{10} = k_{10} \sum_{\lambda=1}^{\lambda=u} \phi(\lambda) \bar{y}_{10}(\lambda) \Delta\lambda$$

$$x_{10} = \frac{X_{10}}{X_{10} + Y_{10} + Z_{10}} \quad y_{10} = \frac{Y_{10}}{X_{10} + Y_{10} + Z_{10}}$$

The chromaticity co-ordinates are formed by the tristimulus values

$$X_{10} = k_{10} \sum_{\lambda=1}^{\lambda=u} \phi(\lambda) \bar{x}_{10}(\lambda) \Delta\lambda$$