SLOVENSKI STANDARD
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Keramiļ ne ploģļ ice - 16. del: Ugotavljanje majhnih barvnih razlik

Ceramic tiles - Part 16: Determination of small colour differences

Carreaux et dalles céramiques - Partie 16: Détermination de faibles différences de couleur

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91.100.23	Keramiļ ne ploģļ ice	Ceramic tiles

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Ceramic tiles —

Part 16:
Determination of small colour differences

Carreaux et dalles céramiques —

Partie 16: Détermination de faibles différences de couleur

[Revision of first edition (ISO 10545-16:1999)]

ICS 91.100.23

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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 10545-16 was prepared by Technical Committee ISO/TC 189, *Ceramic Tiles*

This second edition cancels and replaces the first edition, subclause(s) 3.5 and 7.2 which have been technically revised.

ISO 10545 consists of the following parts, under the general title *Ceramic tiles* — :

— *Part 1: Sampling and basis for acceptance*

— *Part 2: Determination of dimensions and surface quality*

— *Part 3: Determination of water absorption, apparent porosity, apparent relative density and bulk density*

— *Part 4: Determination of modulus of rupture and breaking strength*

— *Part 5: Determination of impact resistance by coefficient of restitution*

— *Part 6: Determination of resistance to deep abrasion for unglazed tiles*

— *Part 7: Determination of resistance to surface abrasion for glazed tiles*

— *Part 8: Determination of linear thermal expansion*

— *Part 9: Determination of resistance to thermal shock*

— *Part 10: Determination of moisture expansion*

— *Part 11: Determination of crazing resistance for glazed tiles*

— *Part 12: Determination of frost resistance*

— *Part 13: Determination of chemical resistance*

— *Part 14: Determination of resistance to stains*

— *Part 15: Determination of lead and cadmium given off by glazed tiles*

— *Part 16: Determination of small colour differences*

Ceramic tiles —

Part 16:
Determination of small colour differences

1 Scope

This part of ISO 10545 describes a method for utilizing colour measuring instruments for quantifying the small colour differences between plain coloured ceramic tiles, which are designed to be of uniform and consistent colour. It permits the specification of a maximum acceptable value which depends only on the closeness of match and not on the nature of the colour difference.

Colour variations produced for artistic purposes are not covered in this part of ISO 10545.

NOTE This test should only be used when small colour differences between plain coloured tiles are important in a specification or by agreement.

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 10545. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 10545 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

CIE Publication No. 15.2:2004, Colorimetry.

ISO 105-J03:1995, Textiles — Tests for colour fastness — Part J03: Calculation of colour differences.

3 Definitions

For the purposes of this part of ISO 10545, the following definitions apply.

3.1 Chroma

Chroma is an attribute of colour which is defined as deviation from grey of the same lightness

NOTE: The more a colour deviates from grey, the higher the chroma.

3.2 Lightness

Lightness is a parameter which relates the colour to a continuous grey scale between white and black

3.3 CIE[1] 1976 L^* a^* b^* (CIELAB) values

CIELAB values calculated from measured spectral reflectance curves given in CIE Publication No. 15.2

[1] Commission Internationale de l'Eclairage (International Commission on Illumination), Central Bureau, Kegelgasse 27, A-1030 Vienna, Austria.

3.4 CMC[2] colour difference, ΔE_{cmc}

ΔE_{cmc} describes a set of colour difference equations which utilizes CIELAB (ΔL^*, DC*ab, DH*ab) values calculated between a test specimen and a reference standard to determine the ellipsoidal boundary containing all colours which would be visually acceptable when compared to the reference standard

3.5 Commercial factor, cf

The commercial factor is a measurement of the tolerance agreed upon by all parties or those commonly utilized in the tile industry for determining the acceptability of the colour difference, ΔEcmc.

4 Principle

Colorimetric measurements are made on reference standard tiles and a test specimen of tiles of the same colour and the differences are calculated. The calculated CMC colour difference (ΔE_{cmc}) of a test specimen is compared to a reference value, using a previously agreed upon commercial factor (cf) or the cf commonly used in the tile industry, to determine the acceptability of the colour match.

NOTE Colorimetry describes a measure of colour difference, not appearance difference. Calculations are only valid when the reference and test specimens have essentially the same gloss and texture.

5 Test equipment

The instrument used for colour measurement shall be either a reflectance spectrophotometer or a tristimulus colorimeter. The instrument geometry shall conform to one of the four sets of illuminating and viewing conditions specified by the CIE. The instrument geometries are identified by the convention: illuminating geometry/viewing geometry. The four allowed instrument geometries with their abbreviations are 45/normal (45/0), normal/45 (0/45), diffuse/normal (d/0) and normal/diffuse (0/d). If a diffuse geometry (d/0 or 0/d) instrument is used, the specular component of reflectance shall be included in the measurement. The angle between the sample normal and the illuminating beam in 0/d geometry and the angle between the sample normal and the viewing beam in d/0 geometry shall not exceed 10°.

6 Procedure

6.1 Test specimens

6.1.1 Reference specimen

Take one or more tiles containing the same pigments or combination of pigments as the test specimen to avoid the complications of metamerism. A minimum of five representative tiles is normally considered suitable. However, if only a limited number of tiles is available, the most representative tile(s) shall be used.

6.1.2 Test specimen

Statistical methods shall be used to determine the number of randomly selected tiles that will be representative, but the number shall never be less than five.

[2] Colour Measurement Committee, Society of Dyers and Colourists, P.O. Box 244, Perkin House, 82 Grattan Road, GB-Bradford BD1 2JB, United Kingdom.