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Ceramic tiles —

Part 18: Determination of light reflectance value (LRV)

Carreaux et dalles céramiques —

Partie 18: Détermination de la valeur de réflectance lumineuse (LRV)

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Foreword

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Ceramic tiles —

Part 18:
Determination of light reflectance value (LRV)

1 Scope

The objective of this document is to define a test method to determine the light reflectance value (LRV) of ceramic tiles, including mosaic tiles.

It is applicable to solid-coloured, multicoloured and non-uniform shade tile surfaces including tile with flame effects, speckled or textured with different types of finishing.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

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

3.1
solid coloured surface
surface with colour uniformity and same shade value

3.2
multi-coloured surface
surface formed by distinct areas of different colour, which when viewed from a distance of 3 m, remain distinct, or surface formed from small colour specks, which when viewed from a distance of 1 m, assume the appearance of one colour

3.3
non-uniform shade surface
surface with a certain shade variability

3.4
speckled surface
surface or covered with small marks, spots, or shake

3.5
textured surface
surface that causes extreme angular dependences of reflected light and that has a superficial texture with maximum peak-valley distance <2 mm

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3.6
light reflectance value
LRV
value equivalent to the CIE tristimulus value Y, also known as the luminance factor

Note 1 to entry: LRV is expressed as a percent and should include reference to the associated CIE observer angle, CIE illuminant and measurement conditions used to determine the value.

4 Principle

The test in question is the determination of the amount of visible light reflected by the surface product in each direction; the measurement of this reflected light at different wavelengths in visible range, weighted for the sensitivity of light of the human eye, is the light reflectance value.

5 Apparatus

5.1 Type of instrument

Any reflectance-type spectrophotometer or tristimulus colorimeter capable of colour measurements and data colour transformation into CIE tristimulus value, X, Y and Z.

This instrument shall have a reproducibility of 1 unit ΔE CIE L*a*b*, and repeatability of σ = ± 0,2 based on five independent measurements.

Moreover, the instrument shall have a measurement area at least 8 mm diameter, compatible with the aperture of the spectrophotometers available on the market.

5.2 Instrument setup

The LRV measurements can be taken as follows:

— with specular component included (SCI), a 10° visual field and illuminant CIE D65 (standard conditions);

— with specular component included (SCI), a 10° visual field and illuminant CIE F2 (fluorescent);

— with specular component included (SCI), a 10° visual field and illuminant CIE A (incandescent);

— with specular component included (SCI), a 2° visual field and illuminant CIE D65 (daylight);

— with specular component included (SCI), a 2° visual field and illuminant CIE F2 (fluorescent);

— with specular component included (SCI), a 2° visual field and illuminant CIE A (incandescent).

NOTE The illuminant CIE D65 is generally representative of a phase of daylight with a correlated colour temperature of approximately 6 500 K.

5.3 Instrument calibration and standards

Before measurement, the instrument shall be calibrated according to the instructions provided by the manufacturer.

The primary standard for reflectance measurement is a layer of freshly prepared barium sulfate.

Because of the difficulty of preparing a primary standard each time and its variability, calibrated pieces of white opaque glass, porcelain enamel plaques, or glazed ceramic tile are used as working standards and are usually supplied by the manufacturer of the instrument. The manufacturer of each type of instrument provides numerical specifications for the working standards, which have a definite relationship to the CIE values *X, Y,* and *Z*.

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