



VISUAL APPEARANCE EVALUATION OF INTERIORS

This method agrees in principle with ASTM D1729.

1 Scope and Field of Application

1.1 Scope

This method covers a subjective procedure for visual comparison of an interior sample's colour against a reference under illuminants of different spectral distributions.

Visual assessment in accordance with this method will always override numerical measurement data and is compulsory for any type of appearance approval.

1.2 Field of Application

The application is recommended, but not limited to the following interior materials:

- plastic parts
 - o solids with or without texture
 - o painted
 - o foils, sheets & slush skins
 - o foam films & foams
- metallic parts
 - o painted
 - o brushed
- fabrics
 - o not pile-direction sensitive without structure
 - o not pile-direction sensitive with structure
 - o pile-direction sensitive without structure
- leathers
 - o natural
 - o artificial

2 Definitions

Terms and definitions in terminology ASTM E284 are applicable to this method. Definitions of terms specific to this method are:

Effect Colour The perceived colour is strongly depending on the angles of observation and illumination. Besides the diffuse reflecting colour pigments the surface layers also contain directional reflecting effect particles.

Date	Action	Revisions
2010 01 19	Activated	In reference to BI109-01 and (inter)national norms

Printed copies are uncontrolled



- Equipment
- Master Equipment – The Master Equipment is an instrument to establish the basic references among various levels of standards and among other equipments. This equipment is the normal arbiter in any situation not adequately resolved at a lower level and is retained by the organization that issues the standards.
 - Secondary Equipment – A Secondary Equipment is any other equipment used for colour evaluation of the product by reference to the standards.

- Evaluation Angles
- A fixed angle of 45° between illumination and observer is recommended throughout the evaluation, see figure 2.1 below. Although the mentioned Evaluation Angles are similar to instrumental angles, the results do not need to correlate (visual: fixed observer <-> instrumental: fixed sample!).
- Face Angle – The aspecular angle (as) when a specimen is viewed close to its surface normal and illuminated near 45° . This angle is similar to an instrumental angle of 45° .
 - Flash Angle – The aspecular angle when a sample is viewed close to 25° (15°) from the specular direction and illuminated near 35° (30°). This angle is similar to an instrumental angle of 25° (15°).
 - Flop Angle – The aspecular angle when a sample is viewed close to 75° (110°) from the specular direction and illuminated near 60° ($77,5^\circ$). This angle is similar to an instrumental angle of 75° (110°).

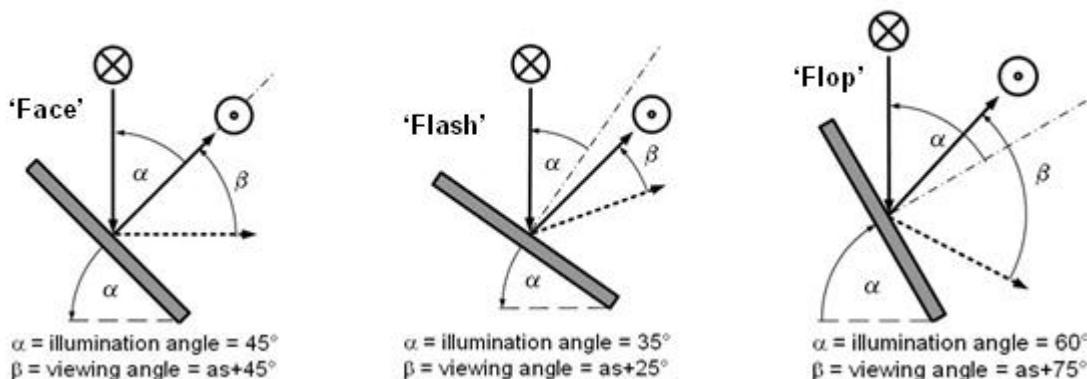


Figure 2.1: Preferred Evaluation Angles

- Graininess The term describes a light/dark pattern that is to be seen under diffuse illumination and is more or less independent of the viewing angle.
- Pile-Direction Sensitive A fabric appears different after brushing over the surface with the hand.
- Reference A standard or any other physical sample that the measurement of samples is correlated to. If only compared within a sample lot, the one sample is chosen to be reference that is visually closest to the idea/vision of the evaluator.



- Standards
- Primary Samples – A Primary Sample is a physical standard out of a production batch, which represents colour and construction.
 - Design Centre Standard – The Design Centre Standard is the one physical standard representing the colour target for visual and colorimetric evaluation of all products referenced to that colour. It is a chosen one of the set of approved Primary Samples.
 - Master Standards – A Master Standard is a physical standard in routine use as a high precision evaluation tool. Master Standards are made identical to the Design Centre Standard and are instrumentally referenced to it.

Structure Structures are imprints or regular sewing lines that generate locally different pile heights and therefore lead to visually perceivable contrast differences.

3 Requirements

3.1 General

All personnel involved in viewing and evaluating colour shall have taken both

- a colour vision test (recommended: Ishihara Colour-Blindness Test) &
- a vision acuity and discrimination test (recommended: Farnsworth-Munsell 100 Hue Test) for self-assessment and awareness of capabilities. Tests, according to ASTM E1499, shall be repeated at sufficiently frequent intervals.

All evaluators shall be familiar with the colour difference rating scheme according to ISO 3668, see table

Rating	Degree of difference
0	No perceptible difference
1	Very slightly, i.e. just perceptible, difference
2	Slight, but clearly perceptible, difference
3	Moderate difference
4	Considerable difference
5	Very major difference

Table 3.1: Colour difference rating scheme

3.2 Equipment & Maintenance

3.2.1 Illuminating units

The spectral distribution of the illuminating units specified below has been established by the CIE (International Commission on Illumination) and is described in ASTM E308.

- Daylight illumination (CIE Illuminant D₆₅, daylight) shall simulate average daylight at the test piece substrate with a Colour Rendering Index ≥ 95 & class B minimum according to ISO/CIE 23603.
- Incandescent illumination (CIE Illuminant A, light bulb) shall simulate incandescent lighting in homes, at offices, early morning sunrise and late afternoon sunset conditions at the test piece substrate.
- Fluorescent 'three-band' illumination (CIE Illuminant F11, TL84) shall simulate fluorescent lighting used in production, exhibition halls and sale premises at the test piece substrate.