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Paints and varnishes — Lighting and procedure for visual assessments of coatings

Peintures et vernis — Éclairage et mode opératoire pour évaluations visuelles des revêtements

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document 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 13076:2012), which has been technically revised. The main changes compared to the previous edition are as follows:

— addition of Clause 2 on normative references;

— addition of Clause 3 on terms and definitions;

— addition of a new light source, LED;

— addition of examples on the applications of this document in Table A.1;

— complete editorial revision.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Paints and varnishes — Lighting and procedure for visual assessments of coatings

1 Scope

This document specifies the lighting and the procedure for the visual assessment of degraded areas, spots or other defects on or in coatings.

This document is not applicable to the visual comparison of colour, which can be assessed using ISO 3668.

NOTE See Annex A for examples of the possible applications of this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4618, *Paints and varnishes — Terms and definitions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618 apply.

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

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

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

4 Principle

The panel is visually assessed under specified conditions of illumination for degraded areas, spots or other defects.

5 Apparatus

5.1 Fluorescent lamp or dull LED (light-emitting diode), comprising a wide-angle light source with an aluminium-coated reflector positioned to reflect the light downwards (see Figure 1), a colour temperature of 6 500 K and a degree of colour rendering index (CRI) of 9 (corresponding to colour rendering class 1A, i.e. a CRI, R_a, of 90 to 100). This colour temperature is realized in the CIE standard illuminant D65, as described in CIE 15:2004.

NOTE 1 This colour temperature and colour rendering give the light colour 965.

NOTE 2 Physical relationship of luminance and luminous flux: 1 lx = 1 lm/m^2 and 1 lm = 1 cd · sr.

6 Procedure for visual assessment

6.1 General

Either natural or artificial daylight may be used for routine assessments. However, precisely controlled artificial lighting shall be used for arbitration purposes since the properties of natural daylight are not constant and evaluations in natural daylight can be influenced by the surroundings.

6.2 Assessment in natural daylight

Diffuse daylight, such as that which falls from a partly cloudy sky on a north-facing test panel (south-facing in the southern hemisphere), should preferably be used. The areas to be assessed, and the areas surrounding them, shall be uniformly illuminated with an illuminance which shall be not less than 2 000 lx. Direct sunlight shall be avoided.

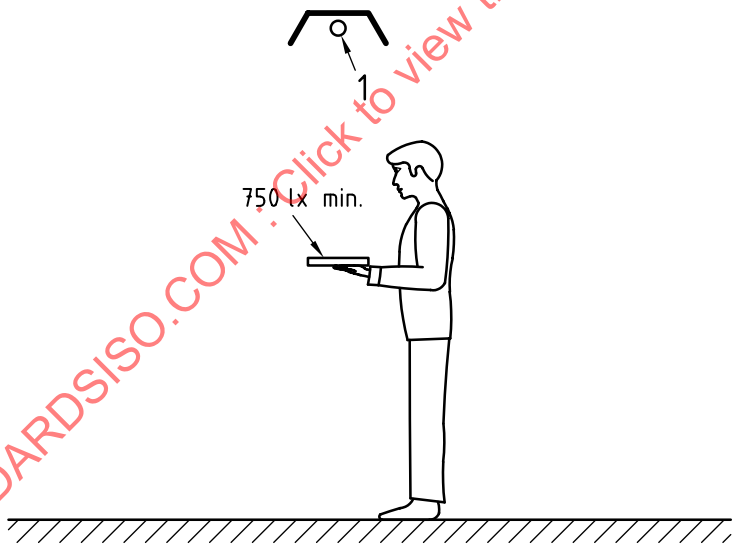
6.3 Assessment under artificial lighting

Assess the coating under a fluorescent lamp or a LED (5.1). Hold the test panel at a distance from the lamp such that the illuminance at the surface of the coating is not less than 750 lx (see Figure 1).

The illuminance shall be measured after setting up the fluorescent lamp or LED.

The panel being assessed may be inclined in any direction. Degraded areas and spots can best be identified when examined at the light/dark boundary produced by the lamp.

Assessments made for arbitration purposes shall always be carried out under artificial light.



Key

1 lamp

Figure 1 — Configuration of lamp, test panel and observer

7 Test report

When the procedure specified in this document is used, the following items shall be added to the test report for the test method standard:

a) a reference to this document, i.e. ISO 13076:2019;

b) an indication of the type of lighting (natural or artificial) under which the test panel was assessed, plus, when artificial lighting was used, details of the type of light source.

Annex A
(informative)

Examples of applications

Table A.1 gives examples of visual assessments for which the procedure specified in this document can be used.

Table A.1 — Examples of applications of this document

Test method	International Standard
Cross-cut test	ISO 2409
Impact tests	ISO 6272-1, ISO 6272-2
Stone chipping	the ISO 20567 series
Chemical resistance, including corrosion tests	the ISO 2812 series, ISO 15710
Defects of coatings	ISO 4628-2, ISO 4628-3, ISO 4628-4, ISO 4628-5, ISO 4628-6, ISO 4628-7, ISO 4628-8, ISO 4628-10
Scratch and mar resistance	the ISO 1518 series, ISO 12137, ISO 21546
Car-wash test	ISO 20566
Bending tests	ISO 1519, ISO 6860, ISO 17132
Drying tests	the ISO 9117 series
Fineness of grind	ISO 1524
Adhesion	ISO 4624, ISO 22970
Sag resistance	ISO 16862
Evaluation of properties of coating systems related to the application process	ISO 28199-3
Scrub resistance	ISO 11998

Bibliography

[1] ISO 1518 (all parts), *Paints and varnishes — Determination of scratch resistance*

[2] ISO 1519, *Paints and varnishes — Bend test (cylindrical mandrel)*

[3] ISO 1524, *Paints, varnishes and printing inks — Determination of fineness of grind*

[4] ISO 2409, *Paints and varnishes — Cross-cut test*

[5] ISO 2812 (all parts), *Paints and varnishes — Determination of resistance to liquids*

[6] ISO 3668, *Paints and varnishes — Visual comparison of colour of paints*

[7] ISO 4624, *Paints and varnishes — Pull-off test for adhesion*

[8] ISO 4628-2, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 2: Assessment of degree of blistering*

[9] ISO 4628-3, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 3: Assessment of degree of rusting*

[10] ISO 4628-4, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 4: Assessment of degree of cracking*

[11] ISO 4628-5, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 5: Assessment of degree of flaking*

[12] ISO 4628-6, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 6: Assessment of degree of chalking by tape method*

[13] ISO 4628-7, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 7: Assessment of degree of chalking by velvet method*

[14] ISO 4628-8, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 8: Assessment of degree of delamination and corrosion around a scribe or other artificial defect*

[15] ISO 4628-10, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 10: Assessment of degree of filiform corrosion*

[16] ISO 6272-1, *Paints and varnishes — Rapid-deformation (impact resistance) tests — Part 1: Falling-weight test, large-area indenter*

[17] ISO 6272-2, *Paints and varnishes — Rapid-deformation (impact resistance) tests — Part 2: Falling-weight test, small-area indenter*

[18] ISO 6860, *Paints and varnishes — Bend test (conical mandrel)*

[19] ISO 9117 (all parts), *Paints and varnishes — Drying tests*

[20] ISO 11998, *Paints and varnishes — Determination of wet-scrub resistance and cleanability of coatings*