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

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



现代环境
Modern Instruments



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Foreword

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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 13076 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

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

1 Scope

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

It is not applicable to the visual comparison of colour, which may be assessed using ISO 3668.

2 Principle

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

3 Apparatus

3.1 Fluorescent lamp, 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 of 9 (corresponding to colour rendering class 1A, i.e. a colour rendering index, R_a , of 90 to 100).

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

4 Procedure for visual assessment

4.1 General

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

4.2 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.

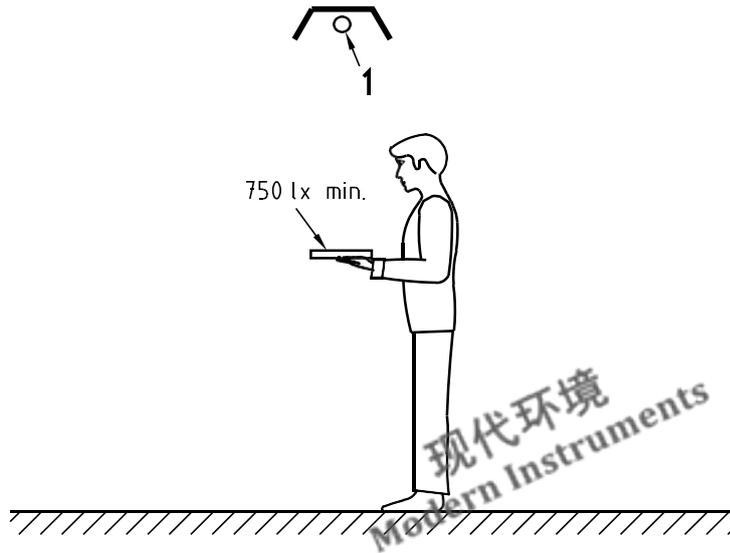
4.3 Assessment under artificial lighting

Assess the coating under a fluorescent lamp as specified in 3.1. 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 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.

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



Key

1 lamp

Figure 1 — Configuration of lamp, test panel and observer

5 Test report

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

- a) a reference to this International Standard (ISO 13076);
- 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 International Standard can be used.

Table A.1 — Examples of applications of this International Standard

Test method	Standard
Cross-cut test	ISO 2409
Impact tests	ISO 6272-1, ISO 6272-2
Stone chipping	ISO 20567-1, ISO 20567-2
Chemical resistance	ISO 2812-1, ISO 2812-2, ISO 2812-3, ISO 2812-4, ISO 2812-5, 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	ISO 1518-1, ISO 1518-2, ISO 12137
Car-wash test	ISO 20566
Bending tests	ISO 1519, ISO 6860, ISO 17132
Drying tests	ISO 9117-1, ISO 9117-2, ISO 9117-3, ISO 9117-4, ISO 9117-5, ISO 9117-6
Fineness of grind	ISO 1524
Pull-off test for adhesion	ISO 4624
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 1518-1, *Paints and varnishes — Determination of scratch resistance — Part 1: Constant-loading method*
- [2] ISO 1518-2, *Paints and varnishes — Determination of scratch resistance — Part 2: Variable-loading method*
- [3] ISO 1519, *Paints and varnishes — Bend test (cylindrical mandrel)*
- [4] ISO 1524, *Paints, varnishes and printing inks — Determination of fineness of grind*
- [5] ISO 2409, *Paints and varnishes — Cross-cut test*
- [6] ISO 2812-1, *Paints and varnishes — Determination of resistance to liquids — Part 1: Immersion in liquids other than water*
- [7] ISO 2812-2, *Paints and varnishes — Determination of resistance to liquids — Part 2: Water immersion method*
- [8] ISO 2812-3, *Paints and varnishes — Determination of resistance to liquids — Part 3: Method using an absorbent medium*
- [9] ISO 2812-4, *Paints and varnishes — Determination of resistance to liquids — Part 4: Spotting methods*
- [10] ISO 2812-5, *Paints and varnishes — Determination of resistance to liquids — Part 5: Temperature-gradient oven method*
- [11] ISO 3668, *Paints and varnishes — Visual comparison of the colour of paints*
- [12] ISO 4624, *Paints and varnishes — Pull-off test for adhesion*
- [13] 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*
- [14] 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*
- [15] 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*
- [16] 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*
- [17] 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*
- [18] 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*
- [19] 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*
- [20] 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*

- [21] ISO 6272-1, *Paints and varnishes — Rapid-deformation (impact resistance) tests — Part 1: Falling-weight test, large-area indenter*
- [22] ISO 6272-2, *Paints and varnishes — Rapid-deformation (impact resistance) tests — Part 2: Falling-weight test, small-area indenter*
- [23] ISO 6860, *Paints and varnishes — Bend test (conical mandrel)*
- [24] ISO 9117-1, *Paints and varnishes — Drying tests — Part 1: Determination of through-dry state and through-dry time*
- [25] ISO 9117-2, *Paints and varnishes — Drying tests — Part 2: Pressure test for stackability*
- [26] ISO 9117-3, *Paints and varnishes — Drying tests — Part 3: Surface-drying test using ballotini*
- [27] ISO 9117-4, *Paints and varnishes — Drying tests — Part 4: Test using a mechanical recorder*
- [28] ISO 9117-5, *Paints and varnishes — Drying tests — Part 5: Modified Bandow-Wolff test*
- [29] ISO 9117-6, *Paints and varnishes — Drying tests — Part 6: Print-free test*
- [30] ISO 11998, *Paints and varnishes — Determination of wet-scrub resistance and cleanability of coatings*
- [31] ISO 12137, *Paints and varnishes — Determination of mar resistance*
- [32] ISO 15710, *Paints and varnishes — Corrosion testing by alternate immersion in and removal from a buffered sodium chloride solution*
- [33] ISO 16862, *Paints and varnishes — Evaluation of sag resistance*
- [34] ISO 17132, *Paints and varnishes — T-bend test*
- [35] ISO 20566, *Paints and varnishes — Determination of the scratch resistance of a coating system using a laboratory-scale car-wash*
- [36] ISO 20567-1, *Paints and varnishes — Determination of stone-chip resistance of coatings — Part 1: Multi-impact testing*
- [37] ISO 20567-2, *Paints and varnishes — Determination of stone-chip resistance of coatings — Part 2: Single-impact test with a guided impact body*
- [38] ISO 28199-3, *Paints and varnishes — Evaluation of properties of coating systems related to the application process — Part 3: Visual assessment of sagging, formation of bubbles, pinholing and hiding power*