
**Paints and varnishes — Evaluation
of quantity and size of defects, and
of intensity of uniform changes in
appearance —**

Part 6:

**Assessment of degree of chalking by
tape method**

*Peintures et vernis — Évaluation de la quantité et de la dimension des
défauts, et de l'intensité des changements uniformes d'aspect —*

*Partie 6: Évaluation du degré de farinage par la méthode du ruban
adhésif*

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Published in Switzerland

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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 document 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*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 139, *Paints and varnishes*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 4628-6:2011), which has been technically revised. The main changes are as follows:

- the title has been shortened;
- the definition of chalking (3.1) has been changed to the entry in ISO 4618:2023;
- the normative references have been updated.

A list of all parts in the ISO 4628 series can be found on the ISO website.

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.

Introduction

ISO 4628-1 specifies the system for designating the quantity and size of defects and the intensity of uniform changes of coatings, and outlines the general principles of the system. This system is intended to be used especially for defects caused by ageing and weathering, and for uniform changes such as colour changes, for example yellowing.

The other parts of the ISO 4628 series provide pictorial standards or other means for evaluating particular types of defect. As far as possible, already existing evaluation schemes have been used as the basis.

The chalking scale used in the first edition (i.e. ISO 4628-6:1990,¹⁾ Figure 1), in the third edition (i.e. ISO 4628-6:2011,¹⁾ Figure 1) and in this document, consists of photographic pictures of adhesive tapes with different amounts of pigment particles adhering to them. The pigment particles are not evenly distributed over each tape. The lower ratings in particular (i.e. 1 to 3) give the impression of cloudiness. Nevertheless, all five ratings in the scale used in the first edition (ISO 4628-6:1990) and in this document are sufficiently different for visual-assessment purposes.

The scale used in the second edition (i.e. ISO 4628-6:2007,¹⁾ Figure 1) was computer-generated. Thus, the white dots representing the pigment particles were distributed very evenly over the tape, with the result that not all the ratings differed sufficiently well from each other for visual assessment to be carried out. While ratings 0,5 to 3,0 on the black background on the scale in ISO 4628-6:2007 could be differentiated sufficiently well from each other, it was hardly possible to visually differentiate between ratings above 3,0, especially ratings 4 and 5. On the white background, the difference between ratings 0,5, 1,0 and 1,5 was not easy to discern. The differences between ratings 1,5 to 5,0 were more evident, however.

Comparing the scale in ISO 4628-6:1990 with the scale in ISO 4628-6:2007, it would appear that rating 1 on the scale in ISO 4628-6:1990 corresponded to 0,5 on the scale in ISO 4628-6:2007, and rating 2 on the scale in ISO 4628-6:1990 corresponded to 1 on the scale in ISO 4628-6:2007.

It was therefore decided that the scale in ISO 4628-6:2007 was unsuitable for use in the visual assessment of the degree of chalking of paints over the whole rating scale from 0,5 to 5,0.

1) Withdrawn.

Paints and varnishes — Evaluation of quantity and size of defects, and of intensity of uniform changes in appearance —

Part 6:

Assessment of degree of chalking by tape method

IMPORTANT — For the assessment of the degree of chalking by the tape method, it is necessary to use the pictorial reference standards contained in this document. Owing to the fact that electronic copies of these standards are subject to change when viewed on screen or printed, it is recommended that only the pictorial standards contained in printed copies of this document purchased from ISO member bodies or their distributors be used when comparing test results.

1 Scope

This document provides pictorial reference standards for designating the degree of chalking of paint coatings. It also describes a method by which the degree of chalking is rated. In using this method, it is essential that care be taken to distinguish between true degradation products and adhering dirt, particularly when chalking is slight.

2 Normative references

There are no normative references in this document.

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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 chalking

surface change in the form of loose adherent powder which appears with degradation of a coating

[SOURCE: ISO 4618:2023, 3.38]

4 Principle

The chalking is removed from the coating under test using an adhesive tape. The chalking adhering to the tape is examined against a contrasting background (either black or white, whichever gives the greater contrast) and the degree of chalking is assessed with reference to a rating scale.

5 Materials

5.1 Self-adhesive transparent tape, of width at least 15 mm.

Commercially available flexible tapes, transparent and without perceptible colour, have been found to be satisfactory. However, the quality of the tape affects the rating obtained. The type of tape shall therefore be agreed on between the interested parties and shall be stated in the test report.

5.2 Background, black or white, with matt finish, for example card or velvet, having a short pile without a tendency to be crushed.

6 Procedure

6.1 Allow the surface to dry at room temperature before carrying out the test.

Place a piece of the adhesive tape (5.1) on the dry coating by applying firm pressure and rubbing with a finger.

The length of the tape should be at least 40 mm.

Remove the tape perpendicularly to the surface and lay it on a background (5.2) of the appropriate colour to give the greater contrast, with the adhesive in contact with the background. Assess light-coloured coatings on the black background and dark-coloured coatings on the white background.

Under consistent illumination, immediately assess (see 6.5) the degree of chalking by comparing the amount of chalk on the tape with the pictorial reference standards in Figure 1. The more background that is visible, the lower the rating. Report the illumination in the test report (see Clause 8).

6.2 The degree of chalking may also be determined quantitatively using a suitable photoelectric instrument to compare the transmittance of the chalked tape with that of unused tape. In this procedure, the adhesive tape shall not be placed on a background (5.2) but on a clean glass slide or open support, which is placed in the optical beam of the instrument.^{[2],[6]} A transmittance of less than 70 % of that of the unused tape indicates chalking.

This instrumental method shall only be used if the pattern of chalking residues on the tape is homogeneous.

6.3 The degree of chalking can vary over a given area. On large areas with a uniform surface (no texture), the determination should preferably be made at several locations and the mean and range reported.

Apply the tape to an area of the panel that has not been used for previous measurements to avoid false readings.

6.4 Ratings obtained with coatings exposed to natural weathering shall be treated with caution as dirt deposited on the surface from the atmosphere can give false values of chalking.

6.5 After removing the chalking from the coating under test, the assessment of each piece of adhesive tape shall be carried out without delay because the appearance of the chalking residues on the adhesive tape and the transmittance of the tape can change with time.

6.6 When testing low-gloss paint coatings, a certain amount of loosely adherent material can be observed, even with unweathered panels. A blank test, carried out on an unweathered panel, is therefore recommended for such coatings.

8 Test report

The test report shall contain at least the following information:

- a) all information necessary for the identification of the sample tested;
- b) a reference to this document, i.e. ISO 4628-6:—);
- c) details of the method used, including:
 - 1) the type of weathering (artificial or natural) of the coating,
 - 2) all details necessary for the identification of the adhesive tape used, including the manufacturer and the name of the tape,
 - 3) all details necessary for the identification of the substrate used as the background for the adhesive tape (see [5.2](#)),
 - 4) the illumination used for the assessment;
- d) the results of the test, including:
 - 1) the numerical rating of the degree of chalking,
 - 2) whether the evaluation was carried out visually or using an instrument (see [6.2](#));
- e) any deviations from the procedure specified;
- f) any unusual features (anomalies) observed during the test;
- g) the date of the test.

[ISO 4628-6](#)

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