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**Paints and varnishes — Coating  
materials and coating systems for  
exterior wood — Natural weathering test**

*Peintures et vernis — Produits de peinture et systèmes de peinture  
pour bois en extérieur — Essai de vieillissement naturel*



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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.

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 16053 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*. It is technically equivalent to EN 927-3.

This second edition cancels and replaces the first edition (ISO 16053:2004), which has been technically revised. The main changes are as follows:

- a) the dimensions of the test panel and the requirements for the wood used for the test panels have been changed;
- b) the requirements concerning the inclination of the growth rings relative to the exposed surface of the test panel have been changed;
- c) the measurement of the film thickness has been described more precisely;
- d) the assessment of the exposed test panels now also includes an assessment of their general appearance;
- e) the photographic rating scale for mould growth (Annex C in the previous edition) has been deleted and mould growth is now assessed in accordance with ISO 4628-1.

# Paints and varnishes — Coating materials and coating systems for exterior wood — Natural weathering test

## 1 Scope

This International Standard specifies a natural weathering test for exterior wood coating systems mainly intended for decoration and protection of planed and sawn wood.

The test provides a means of evaluating the performance of a wood coating system during outdoor exposure. It forms the basis for the performance specification given in EN 927-2.

## 2 Normative references

The following referenced documents are indispensable for the application 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 1513, *Paints and varnishes — Examination and preparation of test samples*

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

ISO 2431, *Paints and varnishes — Determination of flow time by use of flow cups*

ISO 2808:2007, *Paints and varnishes — Determination of film thickness*

ISO 2810, *Paints and varnishes — Natural weathering of coatings — Exposure and assessment*

ISO 2813, *Paints and varnishes — Determination of specular gloss of non-metallic paint films at 20°, 60° and 85°*

ISO 4628-1:2003, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 1: General introduction and designation system*

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*

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*

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*

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*

ISO 7724-1, *Paints and varnishes — Colorimetry — Part 1: Principles*

ISO 7724-2, *Paints and varnishes — Colorimetry — Part 2: Colour measurement*

ISO 7724-3, *Paints and varnishes — Colorimetry — Part 3: Calculation of colour differences*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

### 3 Principle

The resistance to natural weathering of the coating system under test, applied to a wood substrate, is assessed. Durability is evaluated by determining the changes in decorative and protective properties of coatings after 12 months of exposure.

The standard test substrate has been selected to be *Pinus silvestris* (European redwood or Scots pine, subsequently referred to as pine) in order to obtain relevant results more rapidly. Moreover, the sapwood, which is usually present in joinery timber, is used instead of heartwood because paint failure is more evident on the former.

Differences in quality of wood, and in the weather and site conditions, are recognized and allowed for in the method by comparing the test with a reference system. The composition of the reference system (designated the “internal comparison product” or “ICP”) is specified in Annex A.

The standard test substrate is pine sapwood with the rear side of the panel untreated. However, supplementary information on coating performance may be obtained by conducting optional tests on additional wood species, on pine modified or impregnated by industrial processes, by using a pine panel containing a water trap in its exposed face, or by coating the rear side of the panel.

Optional tests are described in Annex E. It is emphasized that they can serve only to provide additional information.

### 4 Apparatus and materials

**4.1 Exposure racks**, inclined at an angle of 45° to the horizontal, on which the specimens are facing towards the equator, in accordance with ISO 2810.

**4.2 Glossmeter**, for the measurement of specular gloss in accordance with ISO 2813, at 60° geometry.

**4.3 Tristimulus colorimeter** or **spectrophotometer**, for the measurement of colour and calculation of colour difference in CIELAB colour coordinates in accordance with ISO 7724-1, ISO 7724-2 and ISO 7724-3.

**4.4 Tape** and **cutting tool**, for the assessment of adhesion in accordance with ISO 2409.

**4.5 Microscope**, with a magnification of  $\times 10$ , for the assessment of surface defects

**4.6 Microscope**, for the measurement of film thickness in accordance with ISO 2808:2007, method 6A.

**4.7 Self-adhesive, transparent tape**, in accordance with ISO 4628-6, for the assessment of chalking.

**4.8 Climate chamber.**

### 5 Sampling

Take a representative sample of the product tested, or of each product in the case of a multi-coat system, as described in ISO 15528.

Examine and prepare each sample for testing, as described in ISO 1513.