

SINGAPORE STANDARD

**Methods of test for paints, varnishes and
related materials**

– Part D6 : Hard dry time – Test using a mechanical
recorder

[ISO title: Paints and varnishes – Drying tests – Part 4: Test using a mechanical recorder]

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(ICS 87.040)

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Methods of test for paints, varnishes and related materials

– Part D6 : Hard dry time – Test using a mechanical recorder

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The content of this Singapore Standard was approved on 15 September 2020 by the Chemical Standards Committee (CSC) under the purview of the Singapore Standards Council.

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The Technical Committee set up the Working Group on Methods of Test for Paints, Varnishes and Related Materials to prepare this standard. The Working Group consists of the following experts who contribute in their *individual capacity*:

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| Convenor | : Dr Li Sihai |
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*Note: Participation until Jul 2019

The organisations in which the experts of the Working Group are involved are:

AdMaterials Technologies Pte Ltd

Akzo Nobels Paints (Asia Pacific)

Haruna Paint Pte Ltd

Nippon Paint (Singapore) Co. Pte Ltd

Pidilite Innovation Centre Pte Ltd

Setsco Services Pte Ltd

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National Foreword

This Singapore Standard was prepared by the Working Group on Methods of Test for Paints, Varnishes and Related Materials set up by the Technical Committee on Surface Coatings under the purview of CSC.

This standard is a modified adoption of ISO 9117-4:2012, "Paints and varnishes – Drying tests – Part 4: Test using a mechanical recorder", published by the International Organization for Standardization. The deviation is as follows:

| Clause | Modification |
|--------|---|
| 6 | Replace "(23 ± 2) °C and ambient relative humidity" with "(27 ± 2) °C and ambient relative humidity of (80 ± 5) %". |

Explanation: To reflect the local climatic conditions.

To facilitate identification, the technical deviation is marked by a margin bar on the left of the standard.

NOTE – Reference to International Standards are replaced by applicable Singapore Standards/Technical References.

For an overview of other parts to Singapore Standard 5, it is recommended to read the information in SS 5 : Part 0 "General introduction" which is issued separately.

This standard is expected to be used by testing laboratories, paints suppliers and manufacturers, contractors, consultants, architects, industry associations and relevant government agencies.

Attention is drawn to the possibility that some of the elements of this Singapore Standard may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

NOTE

1. Singapore Standards (SSs) and Technical References (TRs) are reviewed periodically to keep abreast of technical changes, technological developments and industry practices. The changes are documented through the issue of either amendments or revisions. Where SSs are deemed to be stable, i.e. no foreseeable changes in them, they will be classified as "Mature Standards". Mature Standards will not be subject to further review, unless there are requests to review such standards.
2. An SS or TR is voluntary in nature except when it is made mandatory by a regulatory authority. It can also be cited in contracts making its application a business necessity. Users are advised to assess and determine whether the SS or TR is suitable for their intended use or purpose. If required, they should refer to the relevant professionals or experts for advice on the use of the document. Enterprise Singapore and the Singapore Standards Council shall not be liable for any damages whether directly or indirectly suffered by anyone or any organisation as a result of the use of any SS or TR. Although care has been taken to draft this standard, users are also advised to ensure that they apply the information after due diligence.
3. Compliance with a SS or TR does not exempt users from any legal obligations.

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 9117-4 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

ISO 9117 consists of the following parts, under the general title *Paints and varnishes — Drying tests*:

- *Part 1: Determination of through-dry state and through-dry time*
- *Part 2: Pressure test for stackability*
- *Part 3: Surface-drying test using ballotini*
- *Part 4: Test using a mechanical recorder*
- *Part 5: Modified Bandow-Wolff test*
- *Part 6: Print-free test*

Introduction

The drying time of a coating is significant in determining when a freshly painted room, floor or stairway may be put back in use or when a freshly coated article may be handled or packaged. Slow drying might result in dirt pick-up or, on an exterior surface, moisture might cause a non-uniform appearance.

The test described in this part of ISO 9117 is used to determine, using a mechanical recorder, the various stages of drying or curing in the dry-film formation of organic coatings for the purpose of comparing types of coating or ingredient changes, or both. To evaluate the stages of drying in a quantitative manner, the use of the recorder under controlled environmental conditions is strongly recommended. The use of a mechanical recorder also offers a method of determining the drying characteristics of coatings that cannot be ascertained within the standard 8 h working day.

This test is useful in comparing the behaviour, during drying, of coatings of the same generic type. Determination of actual drying times should be conducted following procedures specified e.g. in ISO 9117-1 or ISO 9117-3.

Methods of test for paints, varnishes and related materials – Part D6 : Hard dry time – Test using a mechanical recorder

1 Scope

This part of ISO 9117 specifies a test for determining the times taken to reach various stages of drying of organic coatings, using a mechanical straight-line or circular drying-time recorder. The use of a mechanical recorder is valuable in comparing the drying behaviour of coatings of the same generic type, when one coating might form a gel at a faster rate than another or might resist scratching better than another. The test is intended to simulate the conditions which exist when painted articles are stacked upon each other.

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 1514, *Paints and varnishes — Standard panels for testing*

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

ISO 3270, *Paints and varnishes and their raw materials — Temperatures and humidities for conditioning and testing*

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