

**SINGAPORE STANDARD**

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

– Part H3 : Assessment of degree of rusting



**SS 5: Part H3 : 2020**  
ISO 4628-3:2016, MOD  
(ICS 87.040)

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– Part H3 : Assessment of degree of rusting

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ISBN 978-981-48-9482-1

The content of this Singapore Standard was approved on 31 March 2020 by the Chemical Standards Committee (CSC) under the purview of the Singapore Standards Council.

First published, 1988

First revision, 2013

Second revision, 2020

CSC consists of the following members:

	<b>Name</b>	<b>Representation</b>
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	Mr Lim Kian Chye / Mr Ng Eng Fu	<i>Housing &amp; Development Board</i>
	Prof Loh Kian Ping	<i>National University of Singapore</i>
	Dr Loh Wah Sing	<i>Individual Capacity</i>
	Ms Pamela Phua	<i>Singapore Paint Industry Association</i>
	Mr Seah Khen Hee	<i>Individual Capacity</i>
	Assoc Prof Timothy Tan	<i>Nanyang Technological University</i>
	Dr Teo Tang Lin	<i>Chemical Metrology Division, Health Sciences Authority</i>
	Mr Yao Yikai	<i>Maritime and Port Authority of Singapore</i>
	Ms Suzanna Yap	<i>National Environment Agency</i>
<b>Co-opted Members</b>	: Ms Christina Loh	<i>Individual Capacity</i>
	Mr Pitt Kuan Wah	<i>Individual Capacity</i>

CSC set up the Technical Committee on Surface Coatings to oversee the preparation of this standard. The Technical Committee consists of the following members:

	<b>Name</b>	<b>Representation</b>
<b>Chairman</b>	: Mr Lim Eng Kiat	<i>Individual Capacity</i>
<b>Secretary</b>	: Ms Wendy Chai	<i>Standards Development Organisation @Singapore Chemical Industry Council</i>
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	Mr Leo Cher	<i>Singapore Green Building Council</i>
	Dr Dien Pandiman / Ms Sathammai Ramanathan	<i>Pidilite Innovation Centre Pte Ltd</i>
	Ms Stephanie Foo	<i>TÜV SÜD PSB Pte Ltd</i>
	Mr Ken Ho	<i>Building and Construction Authority</i>
	Dr K A Khider Mohamed	<i>Haruna Paint Pte Ltd</i>
	Mr Richard Lai	<i>Singapore Institute of Architects</i>
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	Mr Lu Jin Ping	<i>AdMaterials Technologies Pte Ltd</i>
	Ms Pamela Phua	<i>Singapore Paint Industry Association</i>
	Mr Salim Suwignjo	<i>Setsco Services Pte Ltd</i>
	Mr Yap Chu Ing	<i>Housing &amp; Development Board</i>
	Dr Yin Xi Jiang	<i>Singapore Surface Engineering Association</i>

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*:

	<b>Name</b>
<b>Convenor</b>	: Dr Li Sihai
<b>Secretary</b>	: Ms Wendy Chai
<b>Members</b>	: Dr K A Khider Mohamed
	Ms Calista Lee
	Mr Lee Weyliang
	Ms Shirley Lim
	Ms Sathammai Ramanathan
	Mr Simplicio Escano Sala

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*

*TÜV SÜD PSB 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.

It is a revision of SS 5 : Part H3 : 2013 “Methods of test for paints, varnishes and related materials – Part H3: Designation of degree of rusting”.

This standard is a modified adoption of ISO 4628-3:2016, “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”, published by the International Organization for Standardization. The deviations are as follows:

Clause	Modification
1 (Scope)	<p>Delete Paragraph 3:</p> <p>“ISO 4628-1 defines the system used for designating the quantity and size of defects and the intensity of changes in appearance of coatings and outlines the general principles of the system. This system is intended to be used, in particular, for defects caused by ageing and weathering, and for uniform changes such as colour changes, for example yellowing.”</p> <p><i>Explanation:</i> Paragraph 3 of the scope is not applicable as ISO 4628-1 has not been adopted as a Singapore Standard.</p>
4 (Assessment)	<p>Insert the following table after Table 1:</p>

Table 2 — Rating scheme for designating the size of defects

Rating	Size of defect <sup>a</sup>
0	not visible under ×10 magnification
1	only visible under magnification up to ×10
2	just visible with normal corrected vision (up to 0,2 mm) <sup>b</sup>
3	clearly visible with normal corrected vision (larger than 0,2 mm up to 0,5 mm)
4	larger than 0,5 mm up to 5 mm
5	larger than 5 mm
<p>a Unless otherwise specified in subsequent parts of ISO 4628.</p> <p>b Typically, defects larger than 0,2 mm are visible with normal corrected vision.</p>	

*Explanation:* Table 2 of ISO 4628-1 : 2016 was extracted and placed in this standard for easy reference.

NOTE 1 – Reference to International Standards are replaced by applicable Singapore Standards/Technical References

NOTE 2 – Where numerical values are expressed as decimals, the comma is read as a full point.

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 paint, coatings and inks manufacturers, materials suppliers, test laboratories and related 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.

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](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

This third edition cancels and replaces the second edition (ISO 4628-3:2003), which has been technically revised with the following changes:

- a) a normative reference to ISO 13076 for illumination for the assessment has been added;
- b) a note on the rusted area of the degree of rusting Ri 5 has been added.

ISO 4628 consists of the following parts, under the general title *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*
- *Part 2: Assessment of degree of blistering*
- *Part 3: Assessment of degree of rusting*
- *Part 4: Assessment of degree of cracking*
- *Part 5: Assessment of degree of flaking*

- *Part 6: Assessment of degree of chalking by tape method*
- *Part 7: Assessment of degree of chalking by velvet method*
- *Part 8: Assessment of degree of delamination and corrosion around a scribe or other artificial defect*
- *Part 10: Assessment of degree of filiform corrosion*

## Methods of test for paints, varnishes and related materials – Part H3 : Assessment of degree of rusting

### 1 Scope

This part of ISO 4628 specifies a method for assessing the degree of rusting of coatings by comparison with pictorial standards.

The pictorial standards provided in this part of ISO 4628 show coated steel surfaces which have deteriorated to different degrees by a combination of rust broken through the coating and visible underrust.

NOTE 1 The pictorial standards have been selected from the “European rust scale” published by the European Confederation of Paint, Printing Ink and Artists' Colours Manufacturers' Associations (CEPE), Brussels. The correlation between the ISO scale and the “European rust scale” is given in Annex B, Table B.1.

NOTE 2 The correlation between the ISO scale and the rating system of ASTM D 610 is given in Annex B, Table B.2.

NOTE 3 The rust formation on uncoated steel surfaces is designated in accordance with ISO 8501-1 (rust grades A, B, C, and D).

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

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4628-1:2016, *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 13076, *Paints and varnishes — Lighting and procedure for visual assessments of coatings*