International Standard

ISO 4628-3

Fourth edition
2024-11

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

Part 3: Assessment of degree of rusting

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

Partie 3: Évaluation du degré d'enrouillement

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Foreword

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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).

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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 4628-3:2016), which has been technically revised.

The main changes are as follows:

— the title has been shortened;

— the normative references have been updated;

— term 3.1, “degree of rusting” has been deleted;

— new terms 3.1 “red rust”, 3.2 “white rust” and 3.3 “rust traces” have been added;

— Clause 4 on symbols and abbreviations has been added;

— “rusted area” has been changed to “corroded area” in the entire text;

— a note on the original size of the figures has been added to the former Clause 4, which now is Clause 5;

— Table 1 for designating the size of rusting has been added;

— the percentage of the corroded area in Figure A.5 has been corrected;

— the assessment of white rust together with new pictorial standards has been added;

— the assessment of the degree of rusting by estimating the corroded area in per cent has been added;

— point “d) the method of assessment (method 1 or method 2) which was used;” has been added to the test report in Clause 8;

— a new Annex B has been added, showing an example for a test panel after the NSS salt spray test specified in ISO 9227 with a degree of rusting Ri 4;

— the former Annex B has become Annex C;

— in Annex C, the correlation with the ASTM rust scale has been adjusted to ASTM D610-08.

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 describes the system used for designating the quantity and size of defects and the intensity of changes in appearance of coatings, and it 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.

The pictorial standards for red rust 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 Table C.1.

The correlation between the ISO scale and the rating system of ASTM D610-08 is given in Table C.2.

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

Part 3: Assessment of degree of rusting

1 Scope

This document specifies methods for assessing the degree of rusting of surfaces coated with paints and varnishes (organic coatings), and metallic coating plus an organic coating (duplex system), by comparison with pictorial standards.

The pictorial standards provided in this document show surfaces which have deteriorated to different degrees by a combination of rust broken through the coating and visible under-rusting.

The assessment of the degree of rusting in this document is only an estimation of the affected area on specimen. Edges are not included.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 4618, *Paints and varnishes — Vocabulary*

ISO 13076, *Paints and varnishes — Lighting and procedure for visual assessments of coatings*

3 Terms and definitions

For the purposes of this document, the terms and definitions in ISO 4618 and the following 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
red rust
corrosion products formed on ferrous substrates, such as iron or steel

Note 1 to entry: The red rust layer is generally porous, brittle and/or powdery.

3.2
white rust
corrosion products formed on non-ferrous substrates, such as zinc or aluminium

Note 1 to entry: White rust results from the formation of metal hydroxides and oxides when exposed to moist or humid conditions.

Note 2 to entry: The white/grey products are generally porous, brittle and/or powdery.

3.3
rust traces
contamination due to bleeding of the corrosion products formed

4 Symbols and abbreviations

NSS	neutral salt spray
R	red rust
Ri	degree of red rust by comparison with pictorial standards
R%	degree of red rust by estimating the corroded area in per cent
WR	white rust
WRi	degree of white rust by comparison with pictorial standards
WR%	degree of white rust by estimating the corroded area in per cent

5 Assessment of red rust

5.1 Method 1: Assessment of the degree of red rust by comparison with pictorial standards (Ri)

Assess the degree of red rust by means of the pictorial standards (Ri) given in Figures 1 to 5. The original pictures are only examples of organic coated steel surfaces after natural weathering and do not show the rust reactions of surfaces after short time corrosion tests. Annex B shows an example for a test panel after the NSS salt spray test specified in ISO 9227 with a degree of rusting Ri 4. Rust traces shall not be assessed.

NOTE 1 When viewed in A4 format, the photographs in this document are in the original size for comparison.

Figure 1 — Degree of rusting Ri 1

Figure 2 — Degree of rusting Ri 2

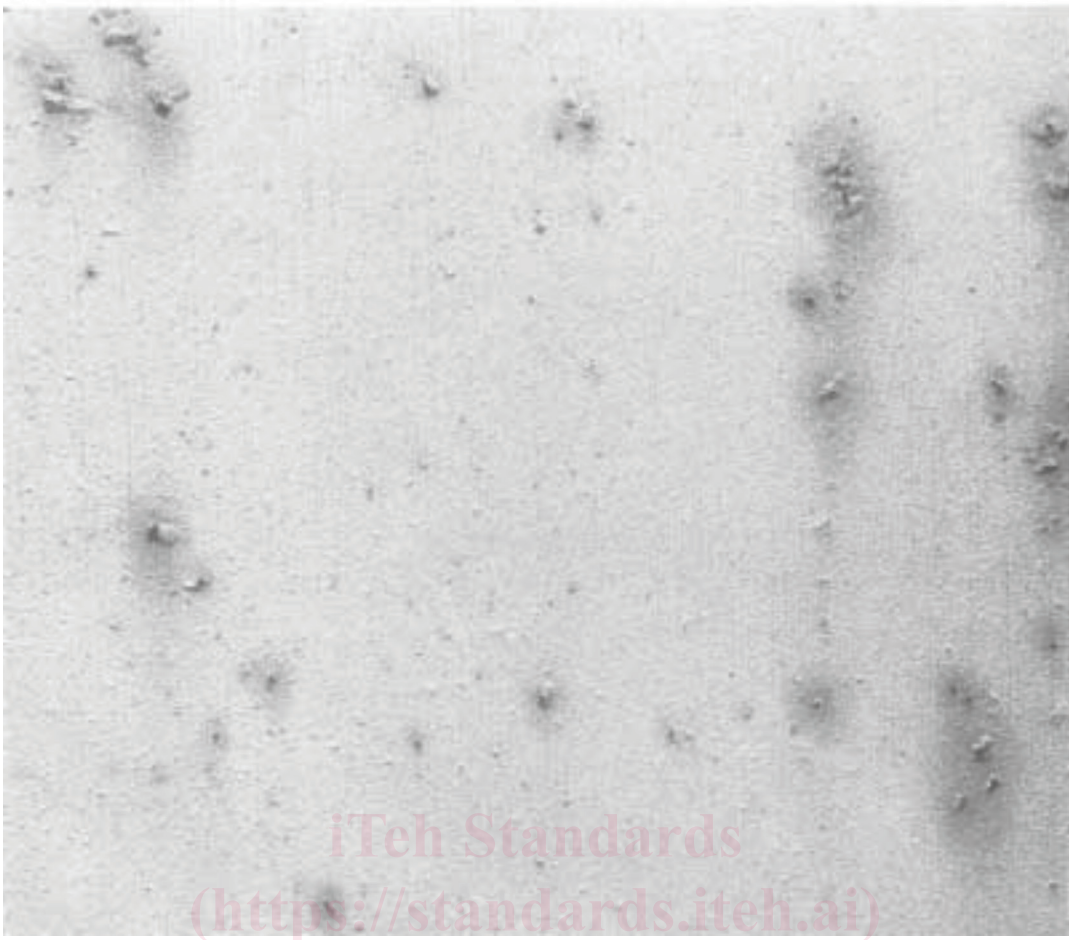

Figure 3 — Degree of rusting Ri 3