FINAL
DRAFT

INTERNATIONAL
STANDARD

**ISO/FDIS
4628-10**

ISO/TC **35**/SC **9**

Secretariat: **BSI**

Voting begins on:
2023-08-30

Voting terminates on:
2023-10-25

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

Part 10: Assessment of degree of filiform corrosion

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

Partie 10: Évaluation du degré de corrosion filiforme

ISO/CEN PARALLEL PROCESSING

Reference number
ISO/FDIS 4628-10:2023(E)

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Published in Switzerland

Contents

Page

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 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 third edition cancels and replaces the second edition (ISO 4628-10:2016), which has been technically revised.

The main changes are as follows:

— the title has been shortened;

— the definition of filiform corrosion (3.1) has been aligned with ISO 4623-1:2018;

— 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.

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

Part 10: Assessment of degree of filiform corrosion

1 Scope

This document specifies a method for assessing the amount of filiform corrosion developed from a scribed mark by measuring the length of the longest filament *L* and the most frequent length *M* of filaments.

Pictorial examples provided in Annex A of this document illustrate different ratings for the degree of filiform corrosion. A comparison of the test panels with the 12 pictures in Annex A does not supersede the obligatory numerical assessment (method 1 or 2).

ISO 4628-1 defines a system used for designating the quantity and size of defects and the intensity of uniform 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 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 13076, *Paints and varnishes — Lighting and procedure for visual assessments of coatings*

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
filiform corrosion
type of corrosion proceeding under a coat of paint, varnish, or related product, in the form of threads, generally starting from bare edges or from local damage to the coating

Note 1 to entry: Usually the threads are irregular in length and direction of growth, but they can also be nearly parallel and of approximately equal length. They usually follow the extrusion direction and do not cross over one another. They shall be initiated by aggressive ions.

[SOURCE: ISO 4623-1:2018, 3.1, modified — "need to" changed to "shall".]

4 Assessment

4.1 General

Carry out the assessment under good illumination, as specified in ISO 13076.

4.2 Method 1

This method applies where there is regular corrosion [see Figure 1 a)].

It includes the following:

— measuring the maximum distances L_l and L_r, in millimetres, from the scribed line to the point to which the filiform corrosion has developed on the left-hand side and on the right-hand side respectively [see Figure 1a)]. This is in order to calculate the length of the longest filament L which is the mean value of L_l and L_r;

— measuring the distances M_l and M_r, in millimetres, to which the scribed line to which the majority of filaments have developed from the left-hand side and on the right-hand side respectively [see Figure 1a)]. This is in order to calculate the most frequent filament length M, which is the mean value of M_l and M_r.

4.3 Method 2

This method applies where there is irregular corrosion [see Figure 1 b)].

It includes:

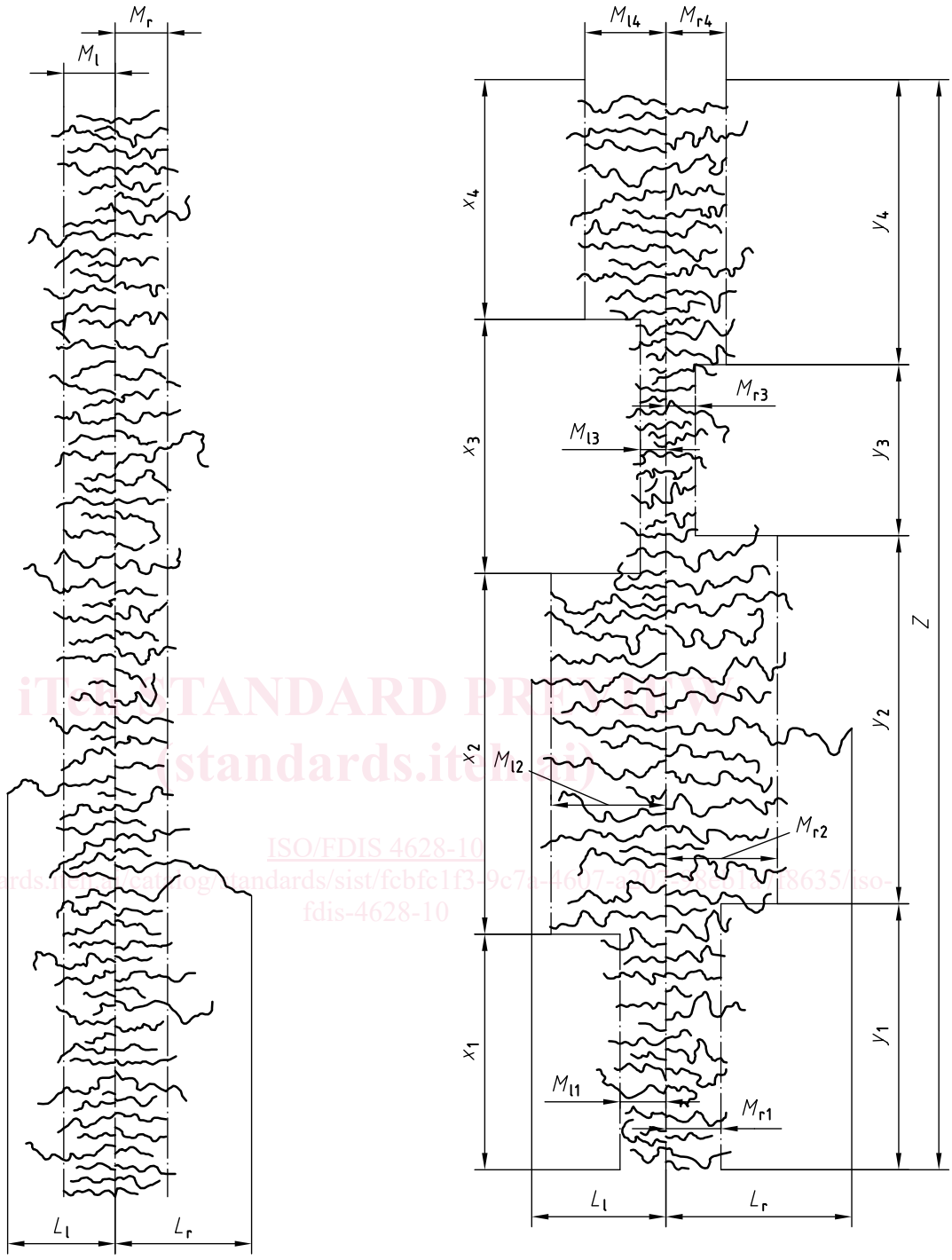
— measuring L, see method 1;

— measuring $M_{l1}, M_{r1}, M_{l2}, M_{r2}$, etc., in order to calculate the overall values M_l and M_r using the following Formulae (1) and (2):

$$M_l = \frac{x_1 M_{l1} + x_2 M_{l2} + x_3 M_{l3} + x_4 M_{l4} \ldots + x_n M_{ln}}{z} \quad (1)$$

$$M_r = \frac{y_1 M_{r1} + y_2 M_{r2} + y_3 M_{r3} + y_4 M_{r4} \ldots + y_n M_{rn}}{z} \quad (2)$$

where M_{l1}, M_{r1}, x_1, y_1, etc., and z are as shown in Figure 1 b).



a) Method 1 **b) Method 2**

Key

L	length of the longest filament	r	(descriptor index) right
M	most frequent filament length	l	(descriptor index) left
x	zones on left-hand side	1, 2, 3, 4	(descriptor index) number of zones
y	zones on right-hand side		
z	overall length of assessed area		

Figure 1 — Determination of length of longest filament and the most frequent filament length

5 Expression of results

Express the numerical ratings of the length of the longest filament *L* and the most frequent filament length *M* as follows:

— filiform corrosion, *L*5/*M*3.

This means a length of the longest filament is 5 mm and a most frequent filament length is 3 mm.

6 Test report

The test report shall contain at least the following information:

a) all details necessary to identify the coating examined;

b) a reference to this document, i.e. ISO 4628-10:—;

c) the type of surface examined, its size and, if appropriate, its location;

d) the result of the assessment in accordance with Clause 5;

e) an indication of the illumination under which the assessment has been carried out;

f) whether the coating was stripped or not;

g) any deviations from the procedure specified;

h) any unusual features (anomalies) observed during the assessment;

i) the date of the examination.

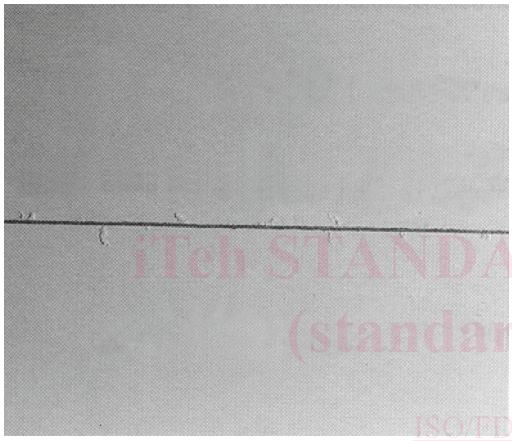
Annex A
(informative)

Pictorial examples for the degree of filiform corrosion

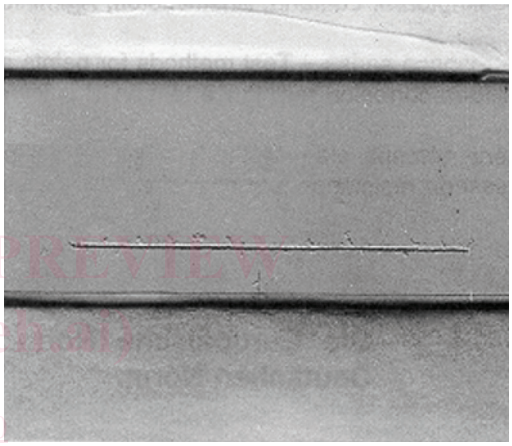
Figure A.1 below shows pictorial examples for the degree of filiform corrosion.

L is a rating for the length of the filaments, i.e. *L* 1 indicates very short filaments, while *L* 5 indicates very long filaments.

M is a rating for the number of filaments, i.e. *M* 1 indicates few filaments, whereas *M* 5 indicates very many filaments.

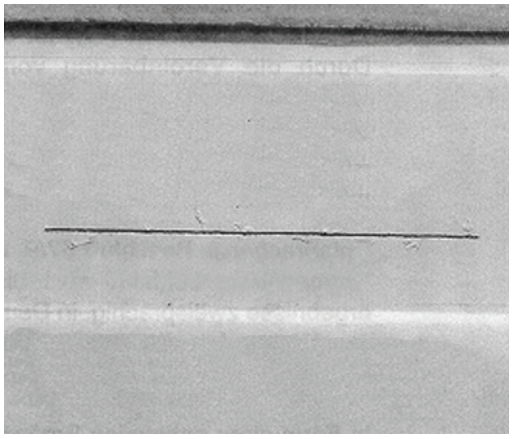


a) *L* 1–2/*M* 1

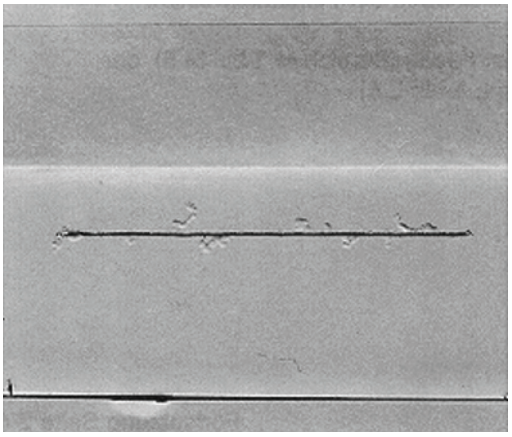


b) *L* 1/*M* 2

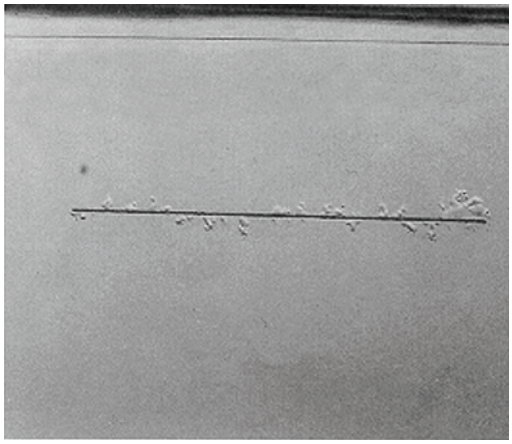
c) *L* 3/*M* 1



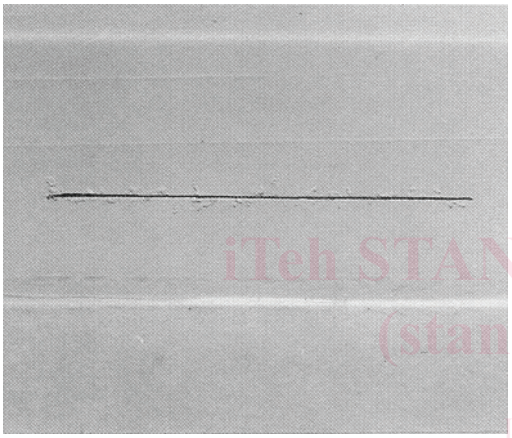
d) *L* 3/*M* 2



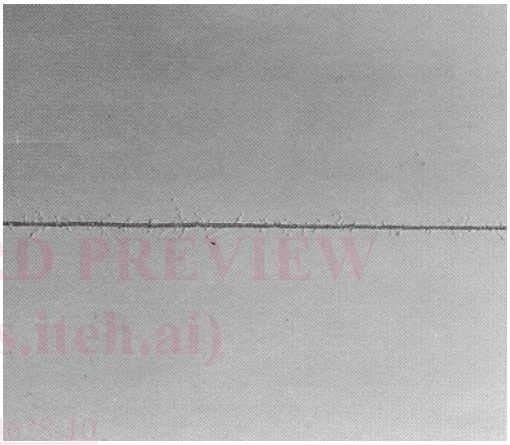
e) *L* 4–5/ *M* 1



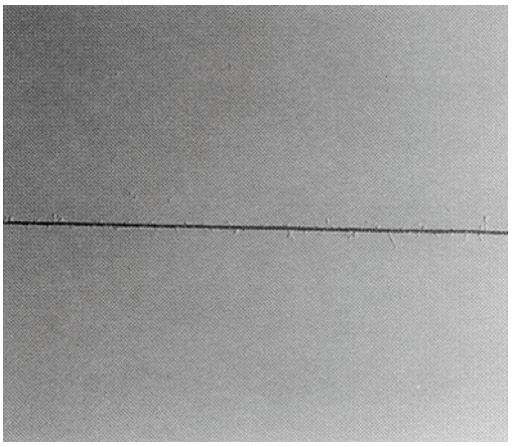
f) *L* 5/*M* 2



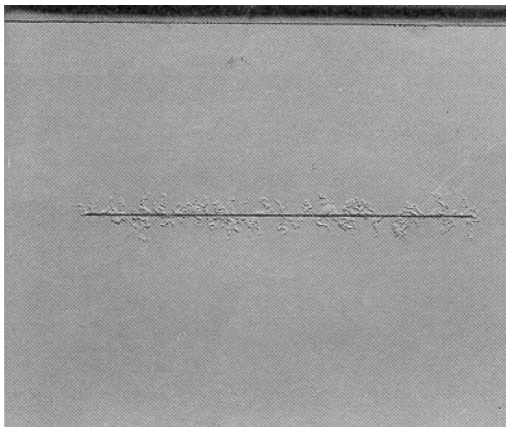
g) *L* 2/*M* 3



h) *L* 2/*M* 4



i) *L* 3/*M* 3



j) *L* 4/*M* 4