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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

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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 documentsdocument 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 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 text has been editorially revised and — the normative references have been updated.

A list of all parts in the ISO 4628 series can be found on the ISO website.

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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.

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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.

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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~~".]]~~".]

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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)~~:~~):

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

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

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

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

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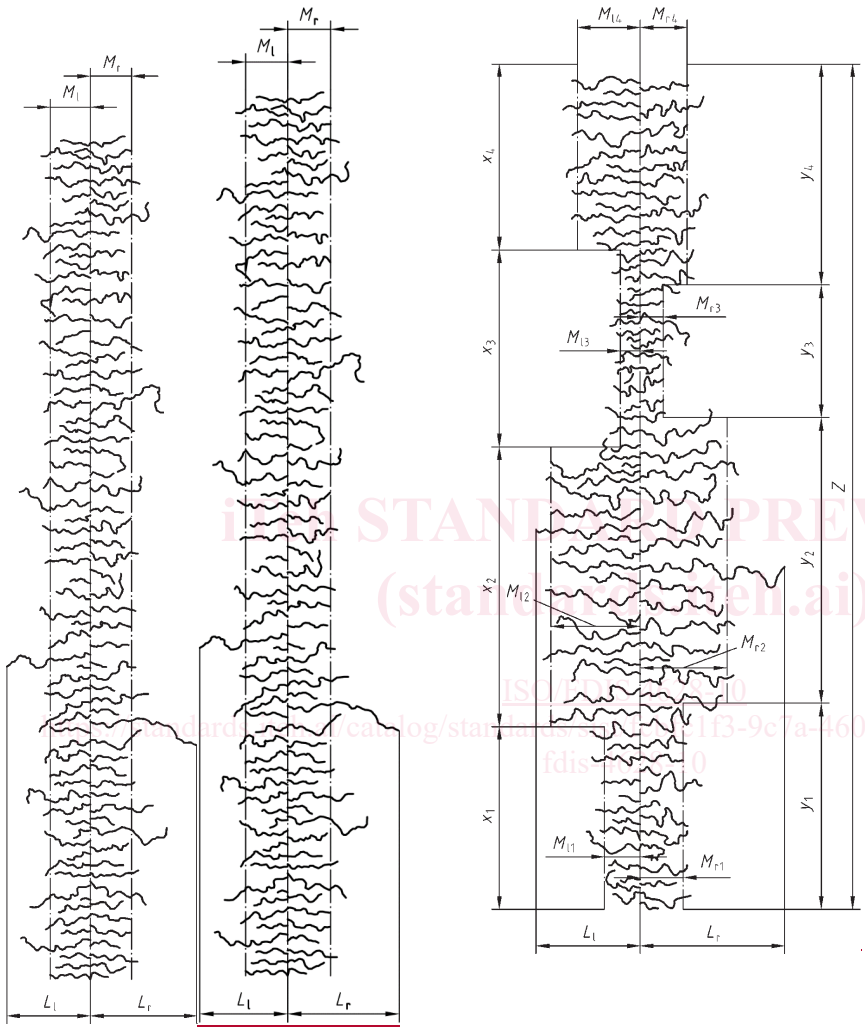

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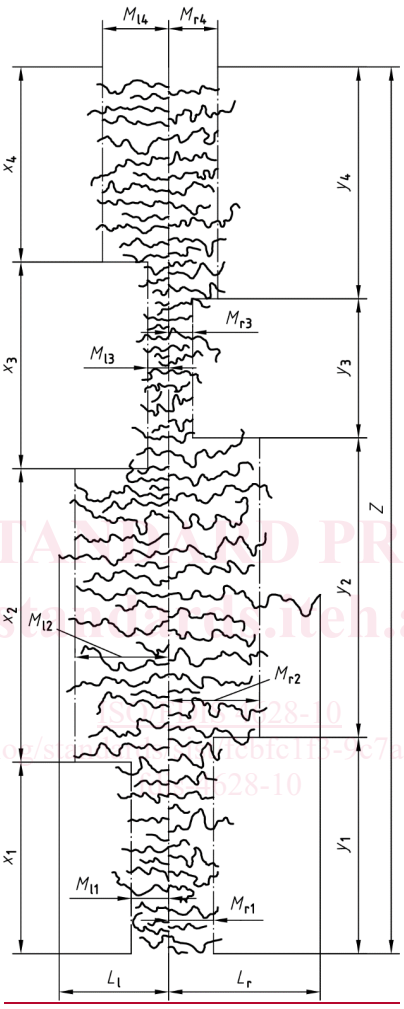

a) Method 1 **b) Method 2**

Key

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

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

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