
**Paints and varnishes — Evaluation of
degradation of coatings — Designation 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 dégradation des revêtements —
Désignation 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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Contents

Page

Foreword.....	iv
1 Scope.....	1
2 Terms and definitions.....	1
3 Assessment.....	1
4 Expression of results.....	2
5 Test report.....	2
Annex A (informative) Pictorial examples of different ratings for the length of the longest filament <i>L</i> and the most frequent filament length <i>M</i>	4
Bibliography	6

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 4628-10 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

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*
- *Part 10: Assessment of degree of filiform corrosion*

Paints and varnishes — Evaluation of degradation of coatings — Designation 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 part of ISO 4628 describes 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 the filaments.

Pictorial examples provided in Annex A of this part of ISO 4628 illustrate different ratings for the length of the longest filament L and the most frequent length M of the filaments. A comparison of the test panels with the 12 pictures in Annex A does not supersede the obligatory numerical assessment (method 1 or 2).

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

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 of the coating

NOTE 1 Usually the threads are irregular in length and direction of growth, but they may also be nearly parallel and of approximately equal length.

NOTE 2 Filiform corrosion can also occur under other protective coatings.

NOTE 3 Usually the threads follow the direction of extrusion of a metal substrate, do not cross over one another and need to be initiated by aggressive ions.

[ISO 4623-1:2000 and ISO 4623-2:2003]

3 Assessment

3.1 General

Carry out the assessment under good illumination.

3.2 Method 1

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

It includes:

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

3.3 Method 2

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

It includes:

- measuring L as in 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 equations:

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

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

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

4 Expression of results

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

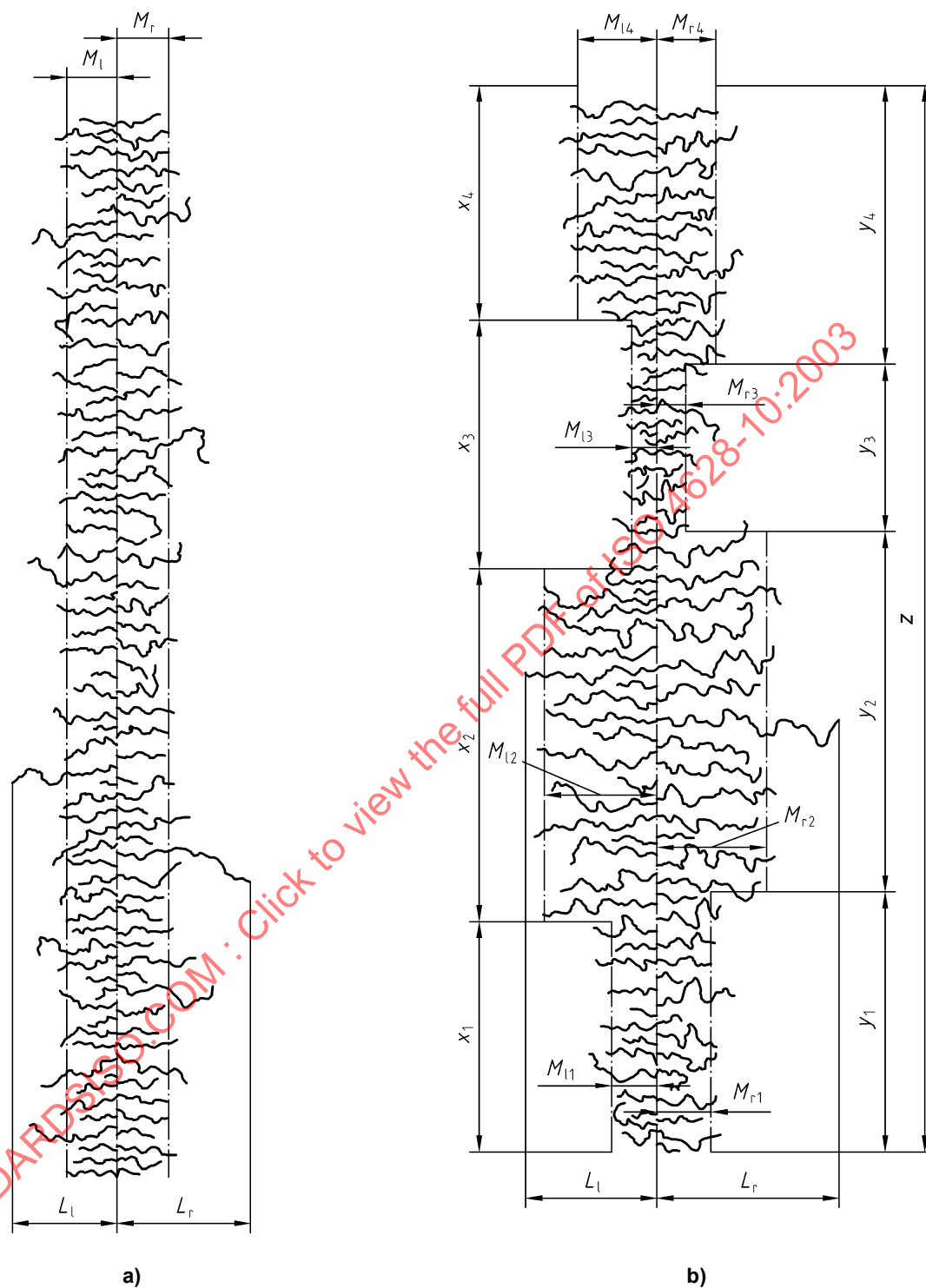
filiform corrosion, $L5/M3$.

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

5 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 part of ISO 4628 (ISO 4628-10:2003);
- c) the type of surface examined, its size and, if appropriate, its location;
- d) the result of the assessment in accordance with Clause 4;
- e) an indication of the illumination under which the assessment was carried out;
- f) whether the coating was stripped or not;
- g) any unusual features (anomalies) observed during the assessment;
- h) the date of the examination.

**Key**

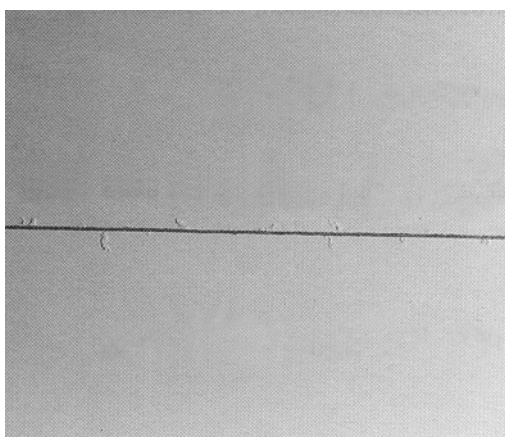
L length of longest filament
 M most frequent filament length
 r right
 l left

1, 2, ... number of zone
 x zones on left-hand side
 y zones on right-hand side
 z overall length of assessed area

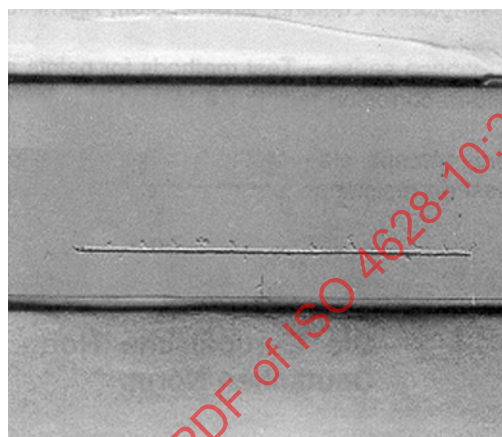
Figure 1 — Determination of length of longest filament L and the most frequent filament length M

Annex A
(informative)

Pictorial examples of different ratings for the length of the longest filament L and the most frequent filament length M



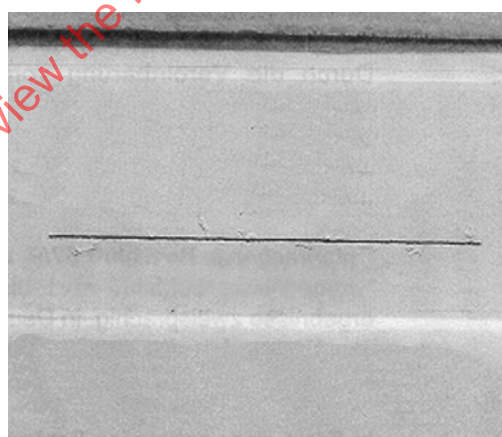
L1-2/M1



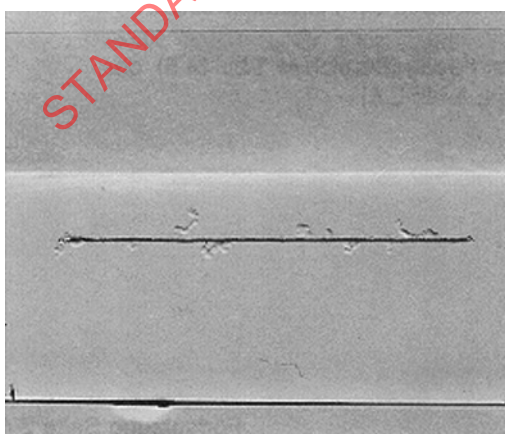
L2/M2



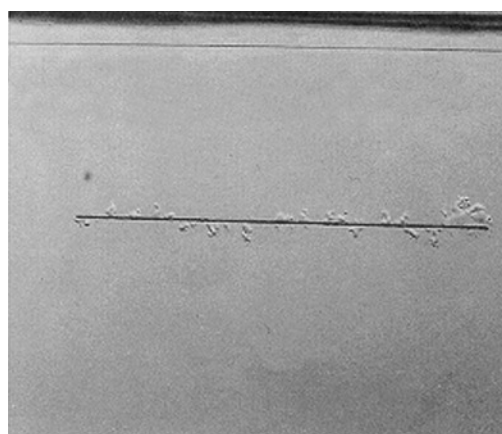
L3/M1



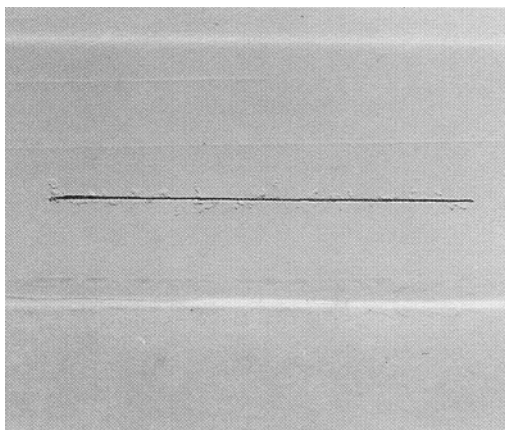
L3/M2



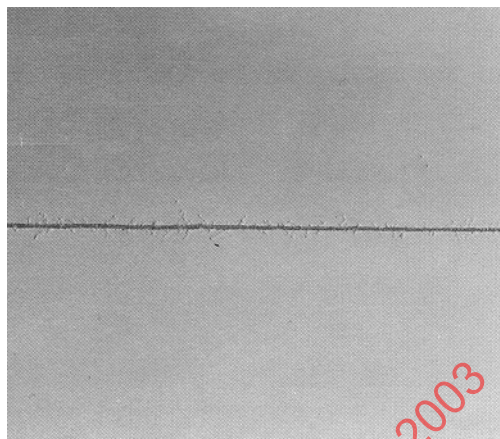
L4-5/M1



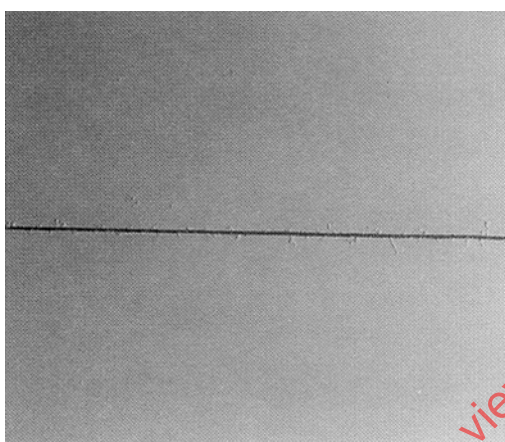
L5/M2



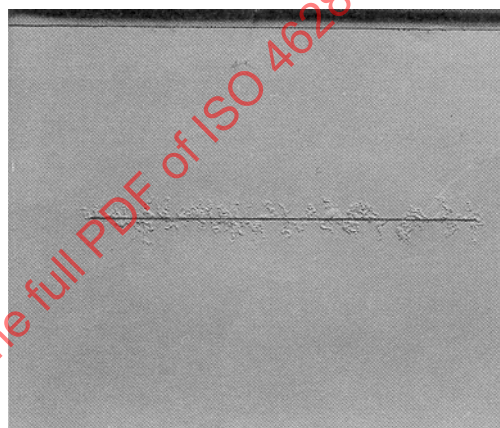
L2/M3



L2/M4



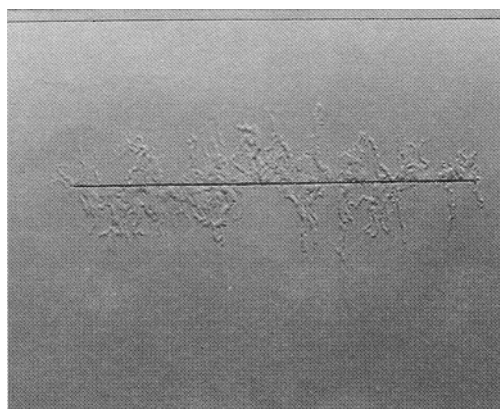
L3/M3



L4/M4



L5/M3



L5/M5