



SLOVENSKI STANDARD

SIST EN 3665:2001

01-januar-2001

Aerospace series - Test methods for paints and varnishes - Filiform corrosion resistance test on aluminium alloys

Aerospace series - Test methods for paints and varnishes - Filiform corrosion resistance test on aluminium alloys

Luft- und Raumfahrt - Prüfverfahren für Anstrichstoffe - Prüfung der Beständigkeit gegen Filiformkorrosion von Aluminiumlegierungen

Série aérospatiale - Méthodes d'essai pour peintures et vernis - Essai de résistance à la corrosion filiforme sur alliage d'aluminium

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Ta slovenski standard je istoveten z: EN 3665:1997

ICS:

49.025.20	Aluminij	Aluminium
49.040	Prevleke in z njimi povezani postopki, ki se uporabljajo v letalski in vesoljski industriji	Coatings and related processes used in aerospace industry

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en

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EUROPEAN STANDARD

EN 3665

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 1997

ICS 49.040

Descriptors: aircraft industry, aluminium alloys, paints, varnishes, filiform corrosion tests, corrosion tests, corrosion resistance

English version

**Aerospace series - Test methods for paints and
varnishes - Filiform corrosion resistance test on
aluminium alloys**

Série aérospatiale - Méthodes d'essai pour
peintures et vernis - Essai de résistance à la
corrosion filiforme sur alliage d'aluminium

Luft- und Raumfahrt - Prüfverfahren für
Anstrichstoffe - Prüfung der Beständigkeit
gegen Filiformkorrosion von
Aluminiumlegierungen

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After inquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 1997, and conflicting national standards shall be withdrawn at the latest by December 1997.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

<https://standards.gost.org/EN/3665-1997/EN3665-1997.htm>

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1 Scope

This standard specifies a test method for the determination of the protective action of coatings of paints or varnishes against filiform corrosion on aluminium alloys.

2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 2090 Aerospace series - Aluminium alloy 2024-T3 - Clad sheet and strip - $0,4 \leq a \leq 6$ mm ¹⁾

EN 2334 Aerospace series - Acid chromate pickling of aluminium and aluminium alloys ¹⁾

3 Definition

For the purposes of this standard, the following definition applies:

Filiform corrosion : a type of corrosion that occurs under coatings on metal substrates. It starts from unprotected edges or local damage through the coating.

4 Principle

Coated metal test pieces are :

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- scribed ;
- placed in a corrosive atmosphere to initiate corrosion ;
- exposed to controlled temperature and humidity conditions conducive to filiform corrosion.

5 Apparatus and reagents

- Tools for scribing grooves
- Container with cover, resistant to hydrochloric acid
- Test cabinet capable of being maintained at the required temperature and relative humidity
- Hydrochloric acid, analytical grade, $\rho = 1,18$ g/cm³

6 Preparation of test pieces

6.1 General

Unless otherwise specified, test pieces shall be in conformity with figure 1.

¹⁾ Published as AECMA Standard at the date of publication of this standard

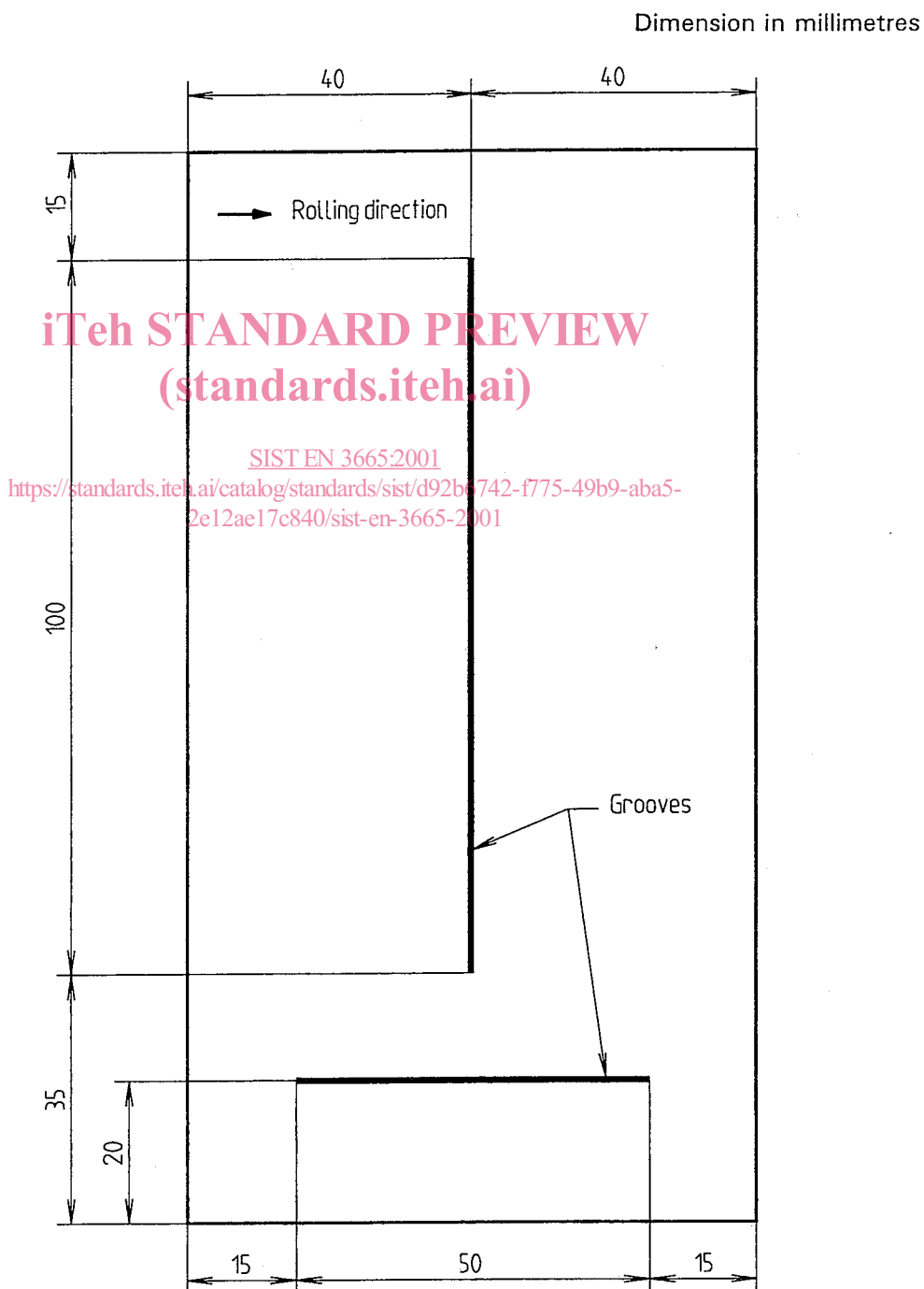
Test pieces shall be treated and coated as indicated in the paint and varnish standard. If the latter does not specify any pretreatment or undercoat of paint, test pieces shall be acid chromate pickled in accordance with EN 2334 and coated with a paint primer within 4 h and subsequently with a finishing paint.

After curing of the coating, grooves shall be scribed to 6.2.

6.2 Grooves

Two grooves shall be made, see figures 1 and 2 or 3.

The paint film at the groove edges shall be smooth.



Material : EN 2090
Thickness : 0,8 mm to 2 mm

Figure 1

6.2.1 Method A

See figure 2.

Dimensions in millimetres

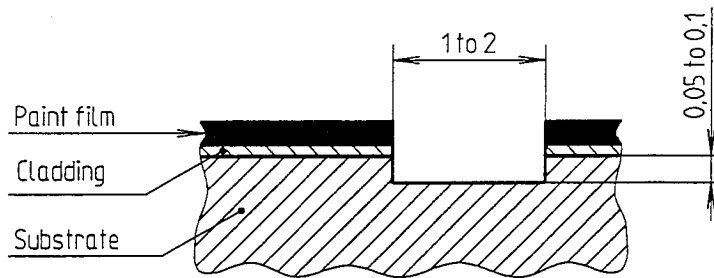


Figure 2

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6.2.2 Method B

See figure 3.

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Dimensions in millimetres

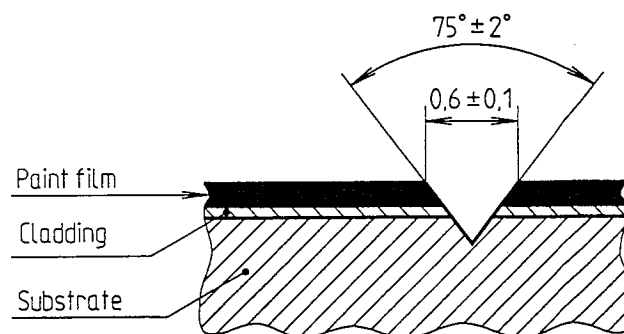


Figure 3

7 Test procedure

The container shall have (20 ± 2) ml of hydrochloric acid per litre of volume. Place the test pieces in the container horizontally with the paint film downwards. The distance between test pieces and liquid level shall be (100 ± 10) mm. The distance between test pieces shall be 20 mm minimum. The container shall remain closed for (60 ± 5) min at a temperature of (23 ± 2) °C. After removal from the container the test pieces shall stand in open air for 15 min minimum and 30 min maximum. Place the test pieces in a test cabinet at a temperature of (40 ± 2) °C and (82 ± 3) % relative humidity for the period time stated in the paint or varnish standard in an approximately vertical position.

If specified, the coating shall be removed with a non corrosive paint remover within 6 h after removal, at least in the deterioration area. Then, the test pieces shall be flushed with warm water and then again with alcohol. The test pieces shall be placed in a desiccator above a drying agent, until evaluation.

8 Evaluation

It shall be carried out using methods 1, 2 or 3 on the groove with the highest degree of corrosion.

8.1 Method 1

This applies where there is regular corrosion, see figure 5.

It includes :

- measuring M_L and M_R , see figure 4, in order to calculate the maximum length M which is the mean value of M_L and M_R ;
- measuring m_L and m_R , see figure 6, in order to calculate the majority length m which is the mean value of m_L and m_R .

8.2 Method 2

This applies where there is irregular corrosion.

It includes :

- determining M , see method 1 ;
- measuring m_{L1} , m_{L2} , etc.,

in order to calculate the overall values m_L and m_R using the following formulae :

$$m_L = \frac{x_1 m_{L1} + x_2 m_{L2} + x_3 m_{L3} + x_4 m_{L4}}{Z} \quad m_R = \frac{y_1 m_{R1} + y_2 m_{R2} + y_3 m_{R3} + y_4 m_{R4}}{Z}$$

where : m_{L1} , m_{R1} , x_1 , y_1 , etc. and Z are defined in figure 6.

8.3 Method 3

This applies in the case of regular and irregular corrosion. The degree of filiform corrosion is obtained by visually comparing the test piece with a series of standard photographs.

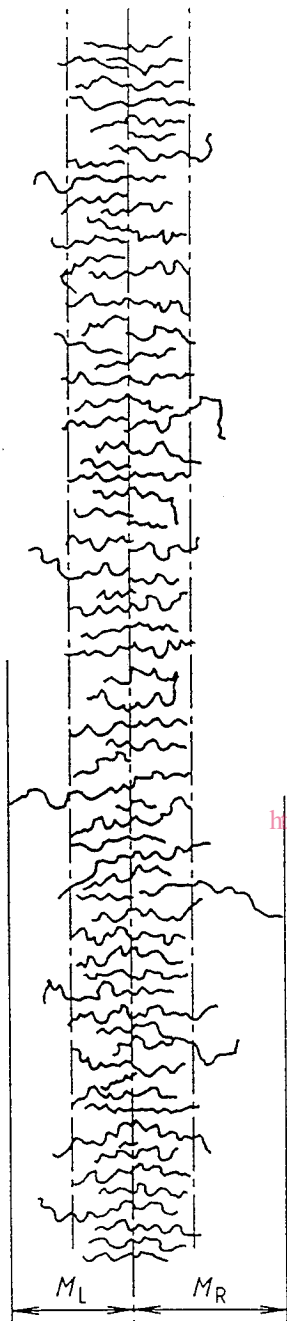


Figure 4

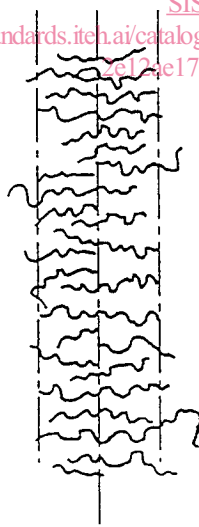


Figure 5

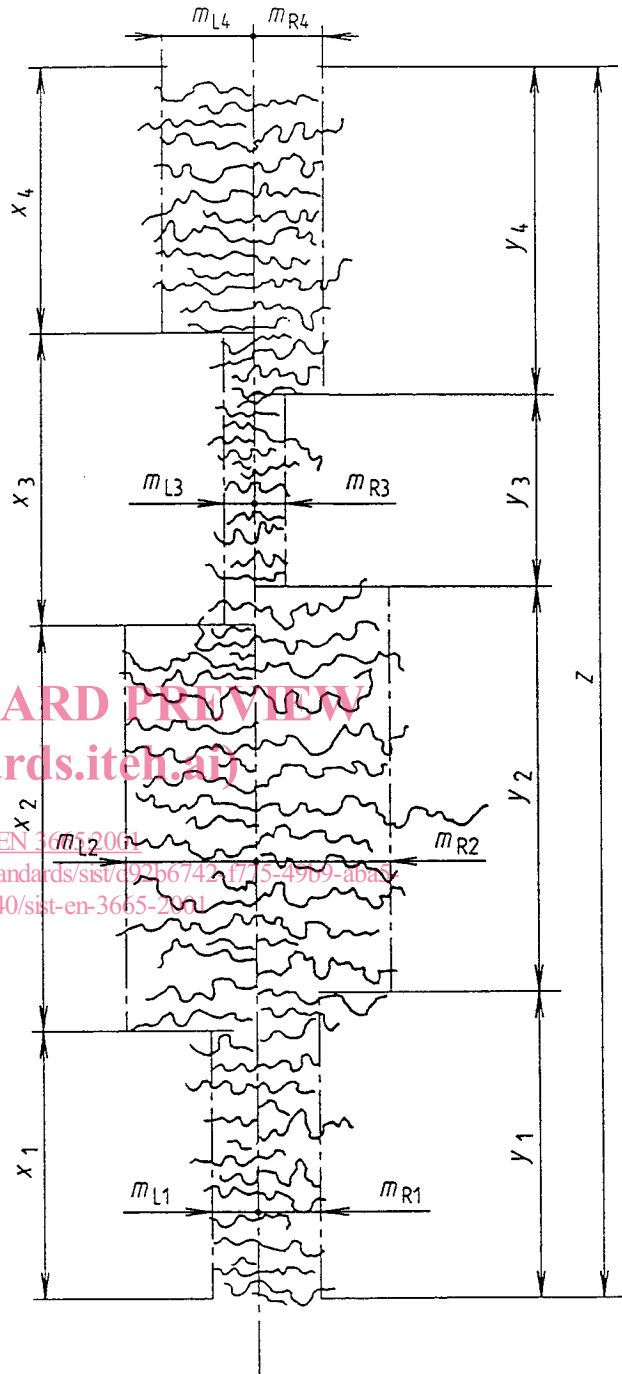


Figure 6

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