SLOVENSKI STANDARD
SIST EN 2781:2001

01-junij-2001

Aerospace series - Non-metallic materials - Structural adhesives - Test methods - Determination of the primer thickness

Aerospace series - Non-metallic materials - Structural adhesives - Test methods - Determination of the primer thickness

Luft- und Raumfahrt - Nichtmetallische Werkstoffe - Strukturelle Klebstoffe - Prüfverfahren - Bestimmung der Haftgrundmittel-Schichtdicke

Série aérospatiale - Matériaux non-métalliques - Adhésifs structuraux - Méthodes d'essai - Détermination de l'épaisseur de primaire

Ta slovenski standard je istoveten z: **EN 2781:1998**

ICS:

49.025.50 Lepila Adhesives

SIST EN 2781:2001 **en**

EUROPEAN STANDARD
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EN 2781

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ICS 49.025.50

Descriptors: Aircraft industry, adhesives, tests, determination, thickness, microscopic analysis, gravimetric methods, eddy current tests

English version

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This European Standard was approved by CEN on 15 May 1998.

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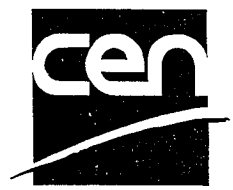
This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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 January 1999, and conflicting national standards shall be withdrawn at the latest by January 1999.

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.

1 Scope

This standard defines the test methods for the determination of the primer thickness for structural adhesives.

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.

ISO 2064 Metallic and other non-organic coatings - Definitions and conventions concerning the measurement of the thickness

ISO 2360 Non-conductive coatings on non-magnetic basis metals - Measurement of coating thickness - Eddy current method

ISO 3543 Metallic and non-metallic coatings - Measurement of thickness - Beta back-scatter method

3 Application of methods

Method A: Microscopic measurement: This destructive method is of general use. It is also used to determine reference values for the non-destructive methods.

Method B: Gravimetric determination: This non-destructive method is particularly suitable for determination of the primer thickness on test panels.

Method C: Eddy current method: This non-destructive method is used for the measurement of the thickness of non-conductive primers on non-ferromagnetic metallic components.

For special applications (e.g. automated production), other methods may be suitable (e.g. the beta backscatter method to ISO 3543).

4 Values for measurement uncertainty

- Method A: ± 0,8 µm
- Method B: ± 1 µm
- Method C: ± 1,5 µm

5 Method A

5.1 Principle

The primer thickness is measured on a cross section by means of an optical microscope.

5.2 Apparatus

- Basic metallographic equipment for the preparation of microscopic sections.
- Optical microscope capable of a magnification of at least 500 times, fitted with an ocular micrometer.

5.3 Test pieces

They shall be:

- cut in the direction from the primer to the base material and perpendicularly to the coating surface;
- embedded in a synthetic resin compound according to a procedure adapted to the material avoiding any reaction with the primer and ensuring a sufficient contrast to it;
- ground and polished until any distortion or damage to the primer due to sampling has been eliminated. The direction of grinding shall be from the primer to the base material.

5.4 Measurement

The thickness shall be measured with a magnification of at least 500 times by means of an optical microscope using incident light, the cross section surface being perpendicular to the optical axis.

The ocular micrometer shall be calibrated before measurement. The calibration factor shall be recorded.

Five measurements shall be made at various points of the cross section.

5.5 Assessment

The primer thickness corresponds to the arithmetical mean of the five measurements.

5.6 Test report

It shall include the following:

- designation of the method: EN 2781A;
- designation of the primer;
- identification of the test pieces, i.e. number and position on the component;
- position of the five measurement points;
- calibration factor of the ocular micrometer;
- thickness in micrometers (individual values and the mean value);
- deviations from this standard.

6 Method B

6.1 Principle

Determination of the average thickness based on the ratio: mass per unit area/density of the primer.

6.2 Apparatus

Balance with a sufficient accuracy to meet the requirements of 6.3.

6.3 Measurements

The coating surface of the test panel shall be measured to 1 mm^2.

The mass of the test panel shall be determined to 0,001 g before applying the primer and immediately after curing.

6.4 Calculation of thickness

The average thickness is calculated as follows:

$$S = \frac{G - G_0}{F \cdot \gamma} \times 10^6$$

where:

S is the average primer thickness, in micrometres;
G is the mass of test panel with cured primer, in grams;
G_0 is the mass of test panel before application of primer, in grams;
F is the coating surface, in square millimetres;
γ is the density of cured primer, in grams per cubic centimetre.

6.5 Test report

It shall include the following:

- designation of the method: EN 2781B;
- designation of primer;
- density of cured primer;
- identification of the test panel;
- calculated average primer thickness;
- deviations from this standard.

7 Method C

7.1 Principle

See ISO 2360.

7.2 Definitions

See ISO 2360 and ISO 2064.

7.3 Apparatus

See ISO 2360.

7.4 Factors affecting the measurement

See ISO 2360.

7.5 Adjustment

See ISO 2360.

7.6 Determining the primer thickness

See ISO 2360.

7.7 Assessment

For every reference area, the local primer thickness is the arithmetical mean of three individual measurements.

The thickness on the significant surface of the measured object is the arithmetical mean of local thicknesses.

7.8 Test report

It shall include the following:

- designation of the method: EN 2781C;
- designation of primer;
- type and designation of the measured object;
- measurement equipment or installations;
- test conditions;
- type of adjustment, and type of reference test piece;
- position of the significant surfaces;
- position and number of the selected reference areas;
- individual values of the thickness measured on the reference areas, local thicknesses;
- calculated mean value for the significant surface;
- deviations from this standard.