SLOVENSKI STANDARD

SIST EN 2243-5:2006

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Aeronavtika – Nekovinski materiali – Konstrukcijska lepila – Preskusna metoda – 5. del: Preskus staranja

Aerospace series - Non-metallic materials - Structural adhesives - Test method - Part 5: Ageing tests

Luft- und Raumfahrt - Nichtmetallische Werkstoffe - Strukturelle Klebstoffsysteme - Prüfverfahren - Teil 5: Alterungsversuche

Série aérospatiale - Matériaux non-métalliques - Systeme d'adhésifs structuraux - Méthodes d'essai - Partie 5 : Essais de vieillissement

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English Version

Aerospace series - Non-metallic materials - Structural adhesives - Test method - Part 5: Ageing tests

Série aérospatiale - Matériaux non-métalliques - Système d'adhésifs structuraux - Méthodes d'essai - Partie 5 : Essais de vieillissement

Luft- und Raumfahrt - Nichtmetallische Werkstoffe - Strukturelle Klebstoffsysteme - Prüfverfahren - Teil 5: Alterungsversuche

This European Standard was approved by CEN on 26 September 2005.

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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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This European Standard (EN 2243-5:2005) has been prepared by the European Association of Aerospace Manufacturers - Standardization (AECMA-STAN).

After enquiries 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of an identical text or by endorsement, at the latest by April 2006, and conflicting national standards shall be withdrawn at the latest by April 2006.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This European Standard supersedes EN 2243-5:1992.

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

Introduction

This standard is part of the series of EN non-metallic material standards for aerospace applications. The general organization of this series is described in EN 4385. This standard is a level 3 document as defined in EN 4385.

1 Scope

This standard defines the general requirements for the determination of resistance of structural adhesives and adhesive bonded joints against environmental influences.

2 Normative references

The following referenced documents are indispensable for the application 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 3768, *Metallic coatings — Neutral salt spray test (NSS test).*

EN 2243-1, *Structural adhesives — Test methods — Part 1 — Single lap shear — Aerospace series.*[1)]

EN 2243-2, *Aerospace series — Non-metallic materials — Structural adhesives — Test method — Part 2: Peel metal-metal.*

EN 2243-6, *Aerospace series — Non-metallic materials — Structural adhesives — Test method — Part 6: Determination of shear stress and shear strain.*

EN 2379, *Aerospace series — Fluids for assessment of non-metallic materials.*[2)]

EN 2743, *Aerospace series — Fibre reinforced plastics — Standard procedures for conditioning prior to testing unaged materials.*

EN 4385, *Aerospace series — Non-metallic materials — General organisation of standardisation — Links between types of standards.*[2)]

3 Definitions, symbols and abbreviations

3.1 Definitions

Not applicable

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

2) Published as AECMA Prestandard at the date of publication of this standard.

3.2 Symbols and abbreviations

For the purposes of this document, the following symbols and abbreviations apply.

τ	average shear stress;
F	average peel strength;
G_e	average elastic shear modulus;
A	bond line area;
R_τ, R_F	reduction percentage in shear strength;
R_G	reduction percentage in shear modulus;
A_a	percentage attacked area.

4 Health and safety

This standard does not necessarily include all health and safety requirements, associated with its use.

Persons using this standard shall be familiar with normal laboratory/test house practices.

It is the responsibility of the user to establish satisfactory health and safety practices and to ensure conformity with any European, national or local laws/regulations.

5 Principle/Technique

Not applicable

6 Resources

6.1 Apparatus

All test equipment shall be calibrated at intervals not exceeding 12 months.

6.1.1 Humidity cabinet

For relative humidity test exposures, a humidity cabinet is required in which the exposure zone can be maintained at (50 ± 3) °C or (70 ± 3) °C and a minimum of 95 % relative humidity.

It shall be possible to record the temperature continuously.

To obtain and to maintain the humidity, only freshly distilled water shall be used.

Airflow is allowed.

6.1.2 Saltspray cabinet

A saltspray cabinet is required, in accordance with ISO 3768.

6.1.3 Fluid containers

For fluid immersion tests, containers are required of sufficient size, capable of maintaining a fluid temperature within the required range (see Table 1), independent of the location of the test panel in the fluid.

It shall be possible to record the temperature continuously.

6.2 Materials/Reagents

Test fluids in accordance with EN 2379 (see Table 1).

6.3 Qualification of personnel

Not applicable

7 Test samples/Test pieces

7.1 Materials

According to the relevant test method (see Table 1).

7.2 Surface preparation before bonding

According to the relevant test method (see Table 1).

7.3 Bonding

According to the relevant test method (see Table 1).

7.4 Dimensions of panels

According to the relevant test method (see Table 1).

7.5 Storage of test panels after bonding

They shall be stored under the following conditions:

— temperature : (23 ± 2) °C;

— relative humidity : (50 ± 5) %.

7.6 Cutting of panels and preparation of test pieces

According to the relevant test method (see Table 1).

NOTE For salt spray testing, the test panels shall be protected against corrosion before cutting to test pieces.

7.7 Test pieces

7.7.1 Dimensions

According to the relevant test method (see Table 1).

7.7.2 Number of specimens

According to the relevant test method (see Table 1).

From each test panel, a minimum of two test pieces shall be used as reference test pieces (see 9).

7.7.3 Identification

Each test piece shall be marked to identify the panel from which it was cut and its position in the panel.

8 Testing procedure

8.1 Ageing

See Table 1.

Table 1

Environment	Temperature (°C)	Time (days)	Code	Clause ref.	Type of test
Relative humidity 95 % to 100 %	50 ± 3	30	A11	8.1.1	EN 2243-1
		60	A12		
		90	A13		
Relative humidity 95% to 100 %	50 ± 3	30	A21		EN 2243-2
		60	A22		
		90	A23		
Relative humidity 95 % to 100 %	50 ± 3	30	A31		EN 2243-6
		60	A32		
		90	A33		
Relative humidity 95 % to 100 %	70 ± 3	10	B11		EN 2243-1
		20	B12		
		30	B13		
Relative humidity 95 % to 100 %	70 ± 3	10	B21		EN 2243-2
		20	B22		
		30	B23		
Relative humidity 95 % to 100 %	70 ± 3	10	B31		EN 2243-6
		20	B32		
		30	B33		
Salt spray ISO 3768	35 ± 2	30	C1	8.1.2	EN 2243-2
		60	C2		
		90	C3		

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