SLOVENSKI STANDARD
SIST EN 2243-2:1998

01-februar-1998

Aeronavtika - Konstrukcijska lepila - Preskusne metode - 2. del: Odpornost stika kovina-kovina proti luģļ enju preko valjev

Aerospace series - Structural adhesives - Test methods - Part 2: Peel metal-metal

Luft- und Raumfahrt - Strukturelle Klebstoffe - Prüfverfahren - Teil 2: Rollen-Schälversuch Metall-Metall

Série aérospatiale - Adhésifs structuraux - Méthodes d'essais - Partie 2: Essai de pelage métal-métal

Ta slovenski standard je istoveten z: EN 2243-2:1991

ICS:

49.025.50 Lepila Adhesives

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EUROPEAN STANDARD

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EN 2243
Part 2

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English version

Aerospace series - Structural adhesives - Test methods - Part 2: Peel metal-metal

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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

Contents list

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 successively received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

According to the Common CEN/CENELEC Rules, the following countries are bound to implement this European Standard :

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxemburg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom

1 Scope and field of application

This standard specifies the dimensions of the test samples and the test method for the determination of the strength of structural adhesives in metal to metal peel at ambient and other temperatures.

This test procedure is not suitable for adhesives having an average peeling strength of less than 30 N per 25 mm.

2 References

EN 2090 Aerospace series - Aluminium alloy 2024-T3 - Clad sheets and strips $0,4 \leqslant a \leqslant 6$ mm [1)]

EN 2334 Aerospace series - Acid chromate pickle for aluminium alloys [2)].

3 Test samples

3.1 The shape and dimensions of the test pieces and the panel from which the test pieces are cut shall correspond to figure 1.

3.2 Materials

The test panel shall be made from the following material :

Aluminium alloy, see EN 2090.

4 Surface preparation

The surface preparation prior to bonding shall conform to EN 2334.

5 Bonding

The application of the adhesive system (adhesive and primer if applicable) and curing shall be carried out according to the instructions of the adhesive manufacturer or the material standard.

6 Storage of test samples after bonding

After curing, samples made with elevated temperature curing adhesives shall be exposed and/or tested after a storage period of 16 hours under the conditions as given below (unless otherwise specified by the adhesive manufacturer).

Samples with room temperature curing adhesives which are not exposed and/or tested immediately after curing, shall also be stored under the conditions as given below (unless otherwise specified by the adhesive manufacturer).

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

2) In preparation at the date of publication of the present standard.

Storage conditions :

- room temperature : (23 ± 2) °C
- relative humidity : (50 ± 5) %.

7 Cutting and preparation of test pieces

The test panel shall be carefully cut into pieces with a suitable tool such as a band saw.

The setting and spacing of the teeth and the operational speed shall be such that the frictional heating of the bond will be kept to a minimum. The cutting shall be straight and parallel.

8 Test conditions

8.1 The test shall be carried out at the temperatures stated in the relevant material standard.

If the test temperature is different from the ambient temperature, the heating rate shall be between 6 °C/min to 10 °C/min.

It is not necessary to control the cooling rate.

The application of load for all tests at temperature other than ambient shall be made immediately after the specimen has been held at the specified test temperature range for 10 min unless a longer term of exposure is required.

8.2 For all test temperatures, except room temperature (23 ± 2) °C, temperature control of the test pieces shall be carried out by means of a thermocouple to ensure the accuracy of the testing temperature and reproducibility of data.

The junction of the thermocouple shall be firmly attached to the test piece at a convenient part and shielded from the heat source.

8.3 The number of test pieces for each test shall be as required by the material standard.

8.4 Each test piece shall be marked in order to ensure identification of the panel from which it was cut.

9 Test method

9.1 Tensile testing machine

An approved tensile testing machine shall be used, the failing load of the test piece shall be within 10 % and 90 % of the upper limit of the selected loading range of the machine.

The test machine shall be equipped with a recording device to make a diagram of the loads.

The test speed shall remain as near constant as possible, even though the load may vary, and the load necessary for peeling shall be measured and recorded with an accuracy of 1 %.

9.2 Method of fixing

The peeling device with the test piece (figure 2) shall be fixed in the upper grip of the test machine and the load indicator set at 0.

Then the non-bonded, thin end of the test piece, which has been passed through the rollers, shall be fixed in the lower grip of the test machine and the load shall be applied.

During the peeling process the peeling load shall be recorded in relation to the movement of the grip. The peeling load shall be determined over a length of at least 150 mm.

9.3 Speed of loading

The speed of the pulling grip shall remain constant during the whole peeling operation and shall be between 50 mm/min and 125 mm/min.

10 Evaluation of results

The peeling diagram shall be evaluated as follows :

The average peeling load shall be determined over a peeling length of 125 mm, by inserting the estimated average value into the diagram as shown in figure 3.

The results of the first 10 mm of the peel separation on the specimen as shown on the peeling diagram after the first maximum load are to be excluded from the assessment of the average value.

In case of doubt, the average peeling load shall be determined by means of a planimeter.

The peeling load shall be expressed in newtons and shall refer to the full width of 25 mm of the specimen.

11 Test report

The test report shall include the following information :

11.1 Complete identification of the adhesive system including the type, supplier's code, date of manufacture, batch number, material standard, etc.

11.2 Complete identification of the material used.

11.3 Detailed information about the preparation of the metal surface prior to bonding.

11.4 Conditions of application and bonding including chosen bonding method (autoclave or press), bondline pressure, heat-up rate, curing time and temperature, etc.

11.5 The number of test pieces used.

11.6 The exposure conditions and test temperature.

11.7 The type of testing machine and speed of loading.

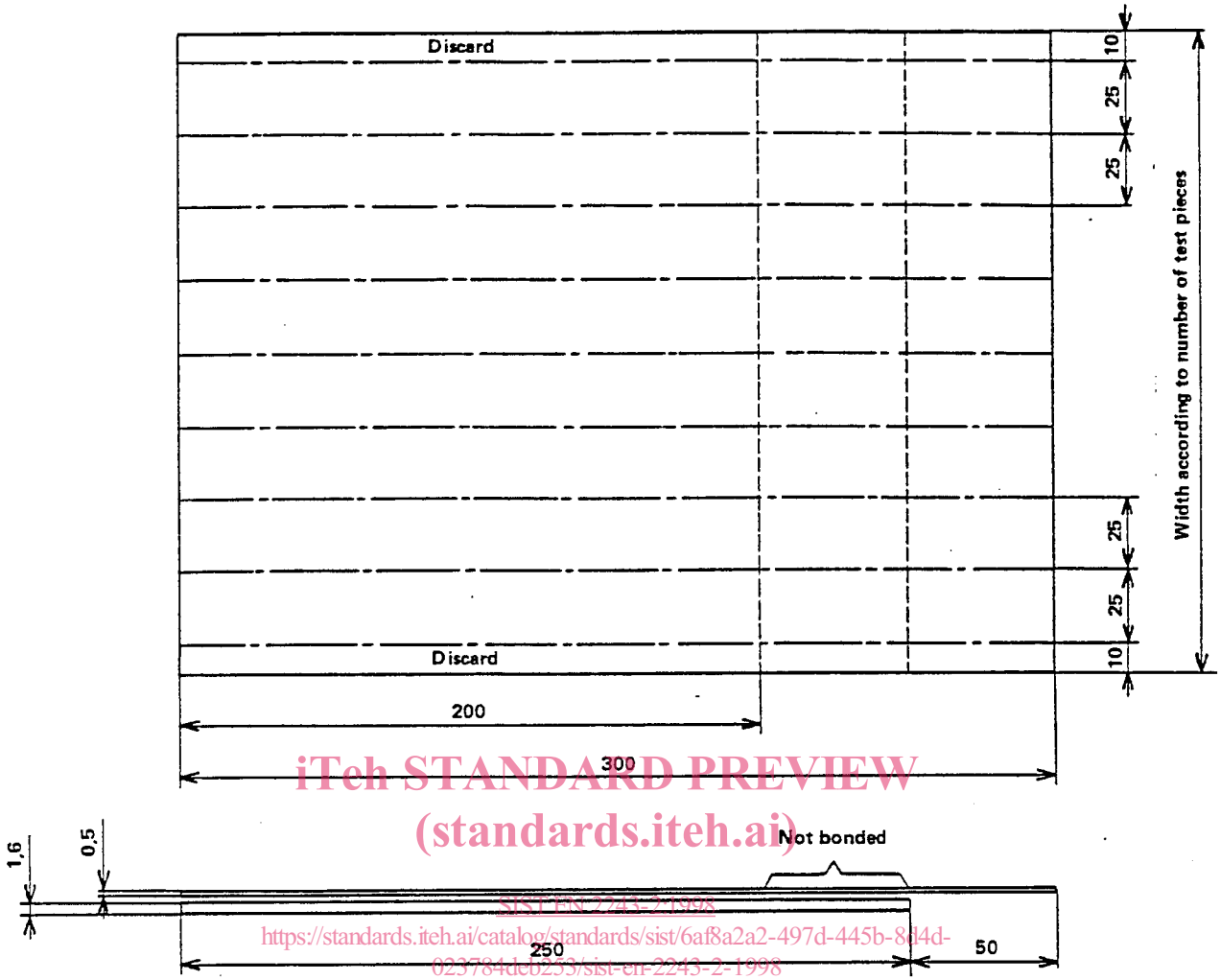
11.8 Information about the individual test pieces including the actual dimensions and the average peeling strength.

11.9 The nature of failure including the estimated average percentage of failure in cohesion and/or adhesion both of adhesive and, if applicable, adhesive primer.

11.10 The average, minimum and maximum value of the peeling strength of the test series.

11.11 Any deviation from this test method shall be described in detail.

Dimensions in millimetres



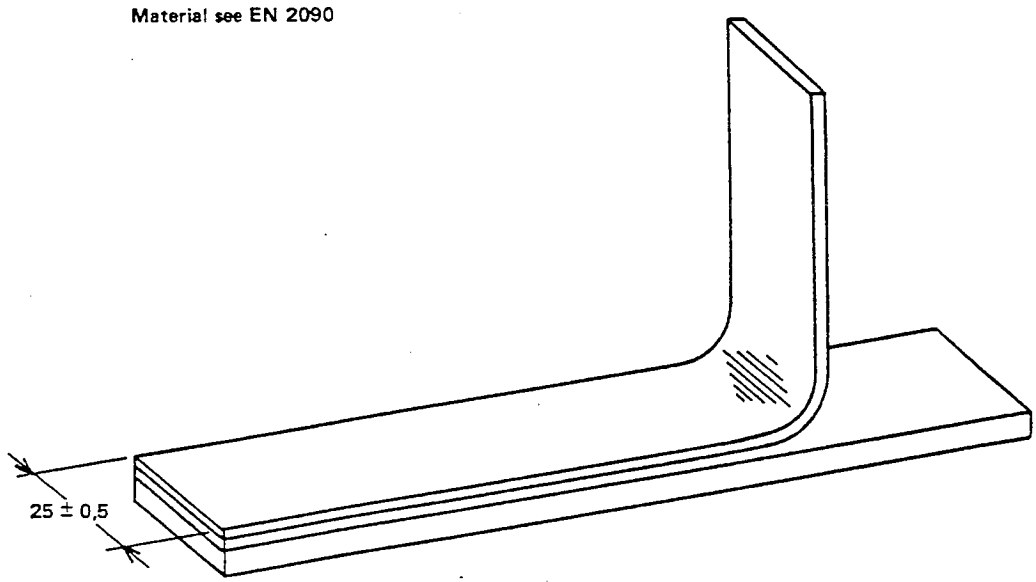


Figure 1 — Test piece