SLOVENSKI STANDARD
SIST EN 2330:2001

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Aerospace series - Textile glass fibre preimpregnates - Test method for the determination of the content of volatile matter

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Luft- und Raumfahrt - Glasfilament-Prepreg - Prüfmethode zur Bestimmung des Anteils an flüchtigen Bestandteilen

Série aérospatiale - Préimprégnés de fibres de verre textile - Méthode d'essai pour la détermination de la teneur en matieres volatiles

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English version

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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.

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of an identical text or by endorsement, at the latest by September 1993, and conflicting national standards shall be withdrawn at the latest by September 1993.

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

1 Scope

1.1 This standard specifies a method for determining the percentage of volatile matter in a textile glass fibre preimpregnate, for aerospace use.

1.2 This standard does not give any directives necessary to meet the health and safety requirements. It is the responsibility of the user of this standard to adopt appropriate health and safety precautions.

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 2743 Aerospace series - Reinforced plastics - Standard procedures for conditioning prior to testing [1)]

3 Definitions

A textile glass fibre preimpregnate with a thermosetting or thermoplastic resin is a material in the form of a synthetic resin impregnated textile glass fibre unidirectional sheet, tape or woven fabric and used for the manufacture of moulded components.

4 Principle

Determination of the loss in mass due to exposure of a specimen at an elevated temperature for a specified time. This loss is expressed as a percentage with respect to the initial mass.

5 Apparatus

5.1 Balance with an accuracy of 0,1 mg

5.2 Template of standard specimen

5.3 Ancillary items such as sharp knife and tweezers

5.4 Tray of suitable material, e.g. metal or ceramic, if necessary to prevent the loss of any resin that may drip from the specimen while it is being heated

5.5 Oven capable of maintaining the agreed temperature with an accuracy of ± 5 °C and provided with a fan for circulating the air

5.6 Desiccator, containing a suitable drying agent (for example, silica gel, calcium chloride, phosphorus pentoxide)

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

6 Atmosphere for conditioning and testing

6.1 Conditioning

6.1.1 Conditioning of material stored at ambient temperature

For material stored at ambient temperature, the amount of material required for testing shall be sampled and conditioned in the test atmosphere (see 6.2.1) for a minimum of 2 h, unless otherwise specified.

6.1.2 Conditioning of material stored below ambient temperature

For material stored at temperatures lower than ambient temperature, the material, suitably packed in an airtight and solvent resistant bag to prevent moisture pick-up, shall be allowed to reach ambient temperature over a period of time according to the mass of the package. This time shall not be less than 8 h and the actual time shall be recorded in the report.

When the material has reached ambient temperature, the amount required for testing shall be sampled and conditioned in the test atmosphere (see 6.2.1), for a minimum of 2 h, unless otherwise specified.

6.2 Testing

6.2.1 Atmosphere for testing

The tests shall be carried out at temperature and relative humidity conditions in accordance with EN2743B.

6.2.2 Time interval between conditioning and testing

Unless otherwise specified, the test shall be carried out within 6 h, after conditioning, the specimen being kept in the test atmosphere until the test is carried out.

7 Sampling and specimens

7.1 Specimen

The specimen has a square shape. The dimension of the sides shall be (100 ± 1) mm.

Other dimensions of the specimen may be used, subject to agreement between the purchaser and supplier, but shall have a surface area of 100 cm^2 with a tolerance of ± 2 %.

7.2 Number and distribution of specimens

At least three specimens shall be used.

These shall be evenly distributed and cut from the sample diagonally across the width or length, as shown in figures 1 and 2 for woven fabrics and in figure 3 for unidirectional sheet or tape.

8 Procedure

Cut the specimens from a representative sample of the material under test, using the appropriate template.

Remove the separating film(s) and weigh each specimen to the nearest mg (m_1), if necessary with a tray previously weighed to constant mass to the nearest mg (m_3).

Transfer the specimens (with tray, if used) to an oven maintained at the specified temperature (see note). Take care that the specimens are well ventilated by the hot air in the oven.

After the agreed time (see note), remove the specimens (and tray, if used) from the oven, cool down to ambient temperature in a desiccator and weigh to the nearest mg (m_2).

NOTE : Oven temperature and time are those specified in the relevant material standard.

9 Calculation and expression of results

The percentage of volatile matter in each specimen is calculated from the formula :

$$V = \frac{(m_1 - m_2)}{m_1} \times 100 \quad \text{without tray}$$

or :

$$V = \frac{(m_1 - m_2)}{(m_1 - m_3)} \times 100 \quad \text{with tray}$$

where :

V : the content of volatile matter expressed as a percentage of the original mass,

m_1 : the initial mass of the specimen (and tray, if used), in g,

m_2 : the mass of the specimen (and tray, if used) after heating, in g,

m_3 : the mass of the tray (if used), in g.

Calculate the arithmetic mean of the values obtained for V.

10 Test report

The test report shall include the following information :

10.1 Reference to the type of preimpregnate, with complete description, including prepreg batch number

10.2 Reference to this standard

10.3 Description of the sampling method

10.4 Number of specimens used, if different from this standard

10.5 Dimensions of specimens, if different from this standard

10.6 Atmosphere used for conditioning and testing and actual time used for conditioning

10.7 Temperature and time used in the oven

10.8 Individual values

10.9 Arithmetic mean value of the content of volatile matter, expressed as a percentage of the original mass

10.10 Observations on any circumstances liable to have influenced the results