



SLOVENSKI STANDARD

SIST EN 2559:2001

01-junij-2001

Aerospace series - Carbon fibre preimpregnates - Determination of the resin and fibre content and the mass of fibre per unit area

Aerospace series - Carbon fibre preimpregnates - Determination of the resin and fibre content and the mass of fibre per unit area

Luft- und Raumfahrt - Kohlenstoffaser-Prepregs - Bestimmung des Harz- und Fasermasseanteils und der flächenbezogenen Fasermasse

Série aérospatiale - Préimprégnés de fibres de carbone - Détermination des teneurs en résine et en fibres et de la masse surfacique de la fibre

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Ta slovenski standard je istoveten z: EN 2559:1997

ICS:

49.025.40 Guma in polimerni materiali Rubber and plastics

SIST EN 2559:2001

en

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EUROPEAN STANDARD

EN 2559

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 1997

ICS 49.025.40

Descriptors: aircraft industry, preimpregnated product, carbon fibre, determination, resin, fibre, specific area

English version

**Aerospace series - Carbon fibre preimpregnates -
Determination of the resin and fibre content and
the mass of fibre per unit area**

Série aéronautique - Préimprégnés de fibres de
carbone - Détermination des teneurs en résine
et en fibres et de la masse surfacique de la
fibre

Luft- und Raumfahrt - Kohlenstofffaser-Prepregs
- Bestimmung des Harz- und Fasermasseanteils
und der flächenbezogenen Fasermasse

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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.

The European Standards exist 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

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

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

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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 September 1997, and conflicting national standards shall be withdrawn at the latest by September 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This standard specifies methods for determining the resin content, fibre content and mass of fibre per unit area of carbon fibre preimpregnates for aerospace use.

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 2558 Aerospace series - Carbon fibre preimpregnates - Determination of the volatile content ¹⁾

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

3 Principle

3.1 Wet combustion extraction method (code A)

Determination of the difference in mass by means of weighing to constant mass before and after extraction of the resin by acid digestion. Use a solution of concentrated sulphuric acid and hydrogen peroxide.

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3.2 Soxhlet extraction method (code B)

Determination of the difference in mass by means of weighing to constant mass before and after extraction of the resin with methyl-ethyl-ketone or other suitable solvent agreed between the user and manufacturer.

3.3 Method of extraction by soaking and decantation (code C)

Similar to 3.2 but faster. In case of dispute, 3.2 shall be applied.

3.4 Information on the use of the methods

3.4.1 Code A method

If the preimpregnate contains only carbon fibre and a resin which is completely "combustible", the resin content is equal to the loss on wet combustion.

The carbon fibre used as a reinforcement may be coated with a resin size, which is normally removed during wet combustion. The size is therefore included in the resin content.

Where undissolved fillers are lost by filtering, they are thus included in the resin content.

NOTE : There may be a partial loss of undissolved fillers, one part being counted with the resin and the rest being counted with the fibres.

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

3.4.2 Code B method

Size normally removed during Soxhlet extraction is included in the resin content.

If the resin contains fillers which do not dissolve in the solvent, the resin content does not include these fillers.

3.4.3 Code C method

Size normally removed during solvent extraction is included in the resin content.

Where undissolved fillers are lost by decantation, they are thus included in the resin content.

NOTE : There may be a partial loss of undissolved fillers, one part being counted with the resin and the rest being counted with the fibres.

4 Apparatus and reagents

4.1 For all methods :

- balance with an accuracy of 0,1 mg ;
- template of standard specimen ;
- ancillary items such as a sharp knife and tweezers.

4.2 For code A method :

- Erlenmeyer 250 ml double necked pear shaped flask with 50 ml dropping funnel equipped with air inlet and a water pump ;
- heat source with suitable temperature control ;
- 400 ml beaker ;
- 20 ml sintered glass crucible (n°2 porosity) and suitable filtration assembly ;
- desiccator containing a suitable drying agent (for example silica gel, calcium chloride or phosphorus pentoxide) ;
- electric oven capable of maintaining a temperature of 120 °C with an accuracy of 5 °C ;
- protective clothing and rubber gloves resistant to hydrogen peroxide and sulphuric acid solutions, safety screen for eye protection ;
- concentrated sulphuric acid (specific gravity : 1,84 to 1,89) ;
- hydrogen peroxide solution (concentration : 300 g/l to 500 g/l) ;
- acetone (propanone) ;
- distilled water.

4.3 For code B method :

- single thickness extraction thimble, nominal diameter 20 mm to 22 mm, nominal length 60 mm to 80 mm ;
- electric oven capable of maintaining a temperature of 105 °C with an accuracy of 5 °C ;
- an extraction apparatus of the Soxhlet type, comprising a condenser, siphon tube and flask and provided with an electric heating mantle ;
- vacuum desiccator ;
- Methyl-ethyl-ketone (MEK : butanone 2) - analytical grade - or other suitable solvent agreed between the user and manufacturer.

4.4 For code C method

- container 400 ml (Erlenmeyer flask or beaker) ;
- electric oven capable of maintaining a temperature of 105 °C with an accuracy of 5 °C ;
- vacuum desiccator ;
- a suitable solvent for extraction, as agreed between the user and manufacturer ;
- acetone (propanone).

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5 Specimens

5.1 Shape and dimensions

The specimen shall be square and have sides of (100 ± 1) mm.

Other specimens may be used, subject to agreement between the user and manufacturer on condition that they have an area of 100 cm² with a tolerance of ± 2 %.

5.2 Number and distribution

A minimum of three specimens shall be used.

They shall :

- be evenly distributed across the width of the sample ;
- have their centres positioned along a straight line.

See figure 1 for wide woven fabrics, figure 2 for narrow woven fabrics and figure 3 for unidirectional sheet or tape.

Dimensions in millimetres

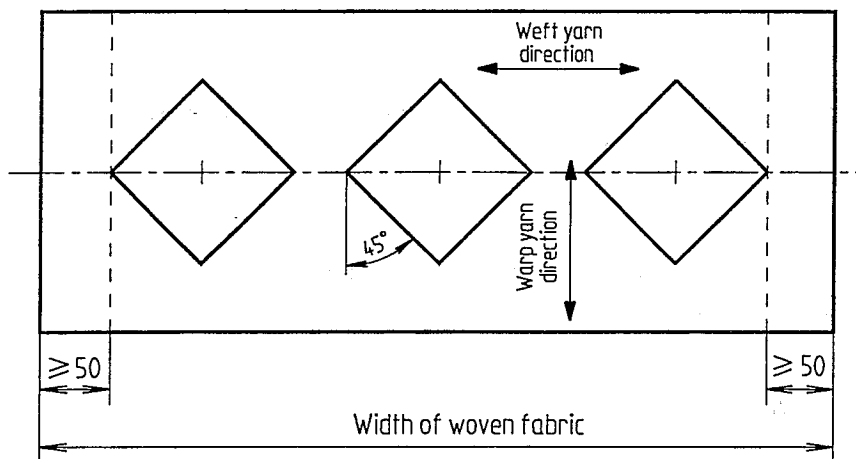


Figure 1

Example of positioning of specimens on woven carbon fibre fabrics sample across the width

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Dimensions in millimetres

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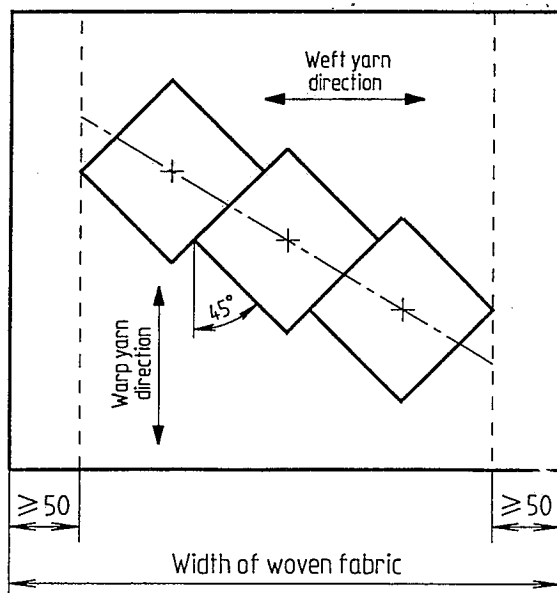
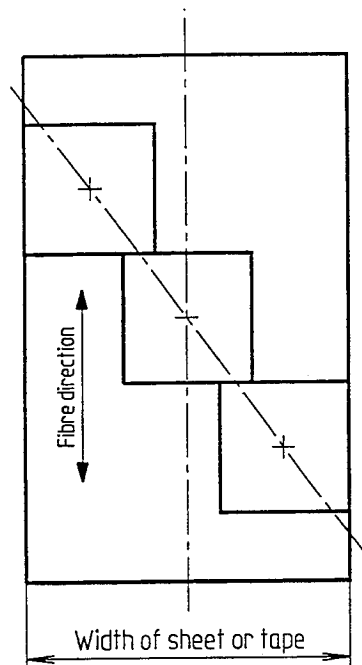


Figure 2

Example of positioning of specimens on woven carbon fibre fabric sample along an axis inclined at an angle as close as possible to the weft direction



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Figure 3

Example of positioning of specimens on carbon fibre unidirectional sheet or tape sample

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