



# SLOVENSKI STANDARD

## SIST ENV 1007-1:2000

01-december-2000

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### Advanced technical ceramics - Ceramic composites - Methods of test for reinforcements - Part 1: Determination of size content

Advanced technical ceramics - Ceramic composites - Methods of test for reinforcements - Part 1: Determination of size content

Hochleistungskeramik - Keramikfasern für keramische Verbundwerkstoffe - Teil 1: Bestimmung des Schlichtegehhalts

Céramiques techniques avancées - Renforcement à base de fibres céramiques pour utilisation dans des composites céramiques - Partie 1: Détermination du taux d'ensimage

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Ta slovenski standard je istoveten z: **ENV 1007-1:1993**

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#### **ICS:**

81.060.30      Sodobna keramika      Advanced ceramics

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**en**

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EUROPEAN PRESTANDARD

ENV 1007-1:1993

PRÉNORME EUROPÉENNE

EUROPÄISCHE VORNORM

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Descriptors: Composite materials, reinforcing materials, ceramics, tests, determination, rates : per unit time, oiling

English version

**Advanced technical ceramics - Ceramic  
composites - Methods of test for reinforcements -  
Part 1: Determination of size content**

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Céramiques techniques avancées Renforcement  
à base de fibres céramiques pour utilisation  
dans des composites céramiques - Partie 1:  
Détermination du taux d'ensimage

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This European Prestandard (ENV) was approved by CEN on 1991-09-10 as a prospective standard for provisional application. The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into an European Standard (EN).

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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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

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**Foreword**

This European Prestandard has been prepared by CEN/TC 184 "Advanced technical ceramics" of which the secretariat is held by BSI.

CEN/TC 184 approved this European Prestandard by resolution 2/1991 during its fourth meeting held in Brussels on 1991-09-10.

ENV 1007 has four parts:

Part 1: Determination of size content

Part 2: Determination of linear density

Part 3: Determination of filament diameter

Part 4: Determination of tensile strength of filament at ambient temperature

This European Prestandard has been prepared under a mandate given to CEN by the Commission of the European Communities and the European Free Trade Association, and supports essential requirements of the EC Directive(s).

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

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## 1 Scope

This Part of ENV 1007 specifies a method for the determination of the size content of ceramic fibres, including silicon carbide, silicon nitride, silicon carbon-nitride, alumino-silicate, alumina or silicon oxide fibres.

## 2 Normative References

This European Pre-Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at appropriate places in the text and in the publications 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 291 Plastics – Standard Atmospheres for conditioning and testing  
ISO 1886 Reinforcement fibres – Sampling plans applicable to received batches

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## 3 Definitions

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3.1 **Size.** Materials applied to the ceramic fibres to facilitate the handling and use of the fibre.

3.2 **Size content.** The mass of the size expressed as a percentage of the original mass of the sized ceramic yarn in the conditioned state.

3.3 **Elementary unit.** The smallest and normally commercially available individuality of a given product.

## 4 Principle

Weighing of test specimens before and after removal of size, according to conditions and method of solvent extraction.

The choice of solvent is to be agreed between supplier and customer. The chemical agent chosen is dependent on size type and is indicated by the manufacturer.

## 5 Apparatus and chemicals

- 5.1 Balance, accurate to  $\pm 0,1$  mg
- 5.2 Hot air oven, for drying specimens, capable of being controlled at the chosen temperature  $\pm 5$  K
- 5.3 Desiccator, containing a suitable desiccant (for example, silica gel, calcium chloride, phosphorus pentoxide)
- 5.4 Thimble, about 25 mm in diameter and about 65 mm in height
- 5.5 Sintered glass filter
- 5.6 Rubber gloves or tweezers
- 5.7 Cutting blade
- 5.8 Reflux extractor with condenser (e.g. SOXHLET)
- 5.9 Heating device, such as a water bath, oil bath, hot plate or isomantle, controllable to the required temperature
- 5.10 Boiling flask
- 5.11 Organic solvent, such as 2-butanone (methyl ethyl ketone), tetrahydrofuran, dimethylformamide, dichloromethane (methylene chloride), acetone, dichloroethane or distilled water, as a function of the size type.

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## 6 Sampling

Sampling of ceramic yarns shall be conducted in accordance with ISO 1886, to determine the number of elementary units to sample. At least three test pieces shall be taken at random from each elementary unit.

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## 7 Conditioning and testing atmosphere

The testing and the prior storage of the test specimens shall be in one of the atmospheres specified in ISO 291. In cases of dispute the ceramic yarn shall be conditioned and tested under conditions agreed between supplier and customer. Any drying procedure of the sized fibre prior to test shall be agreed between supplier and customer.

NOTE : For example  $105 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$ , 1 h.

## 8 Test specimen

Test specimens shall be taken from each yarn sample selected as specified. The minimum mass of the test specimen shall be 2 g. Care shall be taken to handle the specimens only with gloved hands or tweezers.

## 9 Procedure

Dry the filter paper and thimble for 1 h at  $105\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ . Weigh the dried filter paper  $M_2$  and the test specimen of conditioned yarn  $M_1$ . Put the test specimen of yarn in the filter paper and thimble. Fill the boiling flask with a suitable solvent. Adjust the volume of solvent to ensure there is sufficient solvent to fill the reflux system.

Put the thimble with the filter paper, enclosing the test specimen, into extractor with a condenser and fix the whole to the boiling flask. Adjust the rate of refluxing to 5 cycles/h and the number of hours of reflux to ensure that complete extraction of the size is achieved. Remove the thimble with filter paper immediately after the last refluxing.

Dry the filter paper with the test specimen in the hot air oven at a minimum temperature of 5 K over the boiling point of the solvent, until constant mass is achieved. Take care to avoid the breakdown of size during drying. Allow the filter paper to cool in a dessicator and weight to the nearest 0,1 mg  $M_3$ .

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## 10 Calculation of results (standards.iteh.ai)

Calculate the size content ( $\tau$ ) in accordance with the following equation:

$$\tau = \frac{M_2 - (M_3 - M_2)}{M_1} \times 100$$

## 11 Test report

The test report shall contain the following information:

- a) the name and address of the testing establishment
- b) the date of the test, unique identification of report and of each page, customer name and address and signatory
- c) a reference to this Standard, i.e. 'Determined in accordance with ENV 1007-1:1993
- d) the description of the test material; type of fibre, batch number, date of receipt
- e) the size content of each test piece (see clause 6)
- f) comments about the test or test results