



# SLOVENSKI STANDARD

## SIST EN ISO 3344:1999

01-maj-1999

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### Sredstva za ojačenje – Določevanje deleža vlage (ISO 3344:1997)

Reinforcement products - Determination of moisture content (ISO 3344:1997)

Verstärkungserzeugnisse - Bestimmung des Feuchtegehaltes (ISO 3344:1997)

Produits de renfort - Détermination du taux d'humidité (ISO 3344:1997)

Ta slovenski standard je istoveten z: **EN ISO 3344:1997**

[SIST EN ISO 3344:1999](https://standards.iteh.ai/catalog/standards/sist/ecc18773-fl de-4dcb-91af-de3e8b48ac99/sist-en-iso-3344-1999)

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#### **ICS:**

|           |  |  |
|-----------|--|--|
| 59.100.01 | Materiali za ojačitev<br>kompozitov na splošno | Materials for the<br>reinforcement of composites<br>in general |
|-----------|--|--|

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EUROPEAN STANDARD

EN ISO 3344

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 1997

ICS 83.120

Descriptors: see ISO document

English version

**Reinforcement products - Determination of  
moisture content (ISO 3344:1997)**

Produits de renfort - Détermination du taux d'humidité (ISO 3344:1997)      Verstärkungserzeugnisse - Bestimmung des Feuchtegehaltes (ISO 3344:1997)

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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

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## Foreword

The text of the International Standard ISO 3344:1997 has been prepared by Technical Committee ISO/TC 61 "Plastics" in collaboration with Technical Committee CEN/TC 249 "Plastics", the secretariat of which is held by IBN.

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of an identical text or by endorsement, at the latest by November 1997, and conflicting national standards shall be withdrawn at the latest by November 1997.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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 3344:1997 was approved by CEN as a European Standard without any modification.

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INTERNATIONAL  
STANDARD

ISO  
3344

Second edition  
1997-05-15

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**Reinforcement products — Determination  
of moisture content**

*Produits de renfort — Détermination du taux d'humidité*

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Reference number  
ISO 3344:1997(E)

**ISO 3344:1997(E)****Foreword**

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 3344 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 13, *Composites and reinforcement fibres*.

This second edition cancels and replaces the first edition (ISO 3344:1977), which has been technically revised.

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# Reinforcement products — Determination of moisture content

## 1 Scope

This International Standard specifies a method for the determination of the moisture content of reinforcement products, such as continuous-filament yarn, staple-fibre yarn, rovings, chopped strands, mats, fabrics and other forms of reinforcement made from textile glass, carbon or aramid fibres.

## 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 291:—<sup>1)</sup>, *Plastics — Standard atmospheres for conditioning and testing.*

## 3 Definition

For the purposes of this International Standard, the following definition applies:

**3.1 moisture content:** The mass of water contained in a product, determined by a specified method and expressed as a percentage of the mass of the moist product.

## 4 Principle

A test specimen is weighed at ambient temperature, before and after drying at a temperature of 105 °C.

## 5 Apparatus

**5.1 Forced-circulation oven,** with an air-change rate of 20 to 50 times per hour and capable of maintaining a temperature of 105 °C ± 3 °C or the chosen temperature to within ± 3 °C (see clause 4).

**5.2 Desiccator,** containing a suitable drying agent (for example silica gel, calcium chloride or phosphorus pentoxide).

**5.3 Specimen holder,** made of heat-resistant material, allowing the maximum air flow round the specimen and from which there is no loss of material. This may be a porcelain crucible, an unoxidisable metal wire basket, etc.

NOTE — One holder may be used to hold several specimens if they can be transferred from the holder to the oven without loss of material.

1) To be published. (Revision of ISO 291:1977)

**5.4 Stainless-steel tweezers**, for handling the specimen and specimen holder.

**5.5 Balance**, accurate to 0,1 mg.

**5.6 Polished metal template** and **suitable cutting tool**, e.g. a knife, scissors or a rotary cutting disc (for fabrics and mats).

These two items may be replaced by a punch.

**5.7 Stoppered weighing bottle**, for weighing aramid yarn and when the specimen is expected to have a moisture content higher than 0,2 % (for example, specimens taken from the centre of a package or wet chopped strands).

## 6 Selection and number of test specimens

### 6.1 Selection of specimens

Unless indicated otherwise in the product specification or by the person requesting the determination, take the specimens as described below:

#### 6.1.1 Continuous-filament yarn, spun yarn, rovings

The way in which the test specimens are taken is intended to enable the moisture content in the surface layers of the wound package to be checked.

Unwind and discard the outer layers, then, for each specimen, take a length of the wound package with a mass of at least 5 g, but preferably between 15 g and 30 g.

In cases when the moisture content of the wound package is liable to increase towards the centre, the product specification, or the person requesting the determination, may stipulate that the determination be carried out on one or more specimens taken at one or more specified locations within the package. Care should be taken to avoid injury when cutting into a package in order to reach the specimen position at the centre. Weigh specimens taken in this way as quickly as possible. For this purpose, the specimen may be placed in a previously weighed weighing bottle (5.7).

#### 6.1.2 Chopped strands and milled fibres

Each specimen shall have a mass of at least 5 g, but preferably between 15 g and 30 g.

#### 6.1.3 Woven fabrics

Take a piece of fabric of sufficient size to allow specimens of area 100 cm<sup>2</sup> to be obtained. If the mass of the specimen is less than 5 g, either take larger specimens or use several adjacent 100 cm<sup>2</sup> specimens.

Specimens may have the same dimensions as those used for the determination of the mass per unit area.

Do not take specimens at a distance of less than 10 mm from the edges or selvages of the fabric. If the specimen has to be folded, this shall not impede good air circulation round the whole specimen. It is recommended that specimens be cut out using a template and cutting tool, or with a punch (see 5.6), so as to avoid losing material.

#### 6.1.4 Mats

The recommended specimen shape is that specified for the determination of the mass per unit area, i.e. a square cut out using a template of side 316 mm ± 1 mm. Other specimen shapes may be stipulated in the product specification or by the person requesting the determination.



## 6.2 Number of specimens

Unless indicated otherwise, the number of specimens taken from each elementary unit<sup>2)</sup> or laboratory sample<sup>3)</sup> shall be as specified in table 1.

Table 1

| Reinforcement product                            | Number of specimens   |
|--|---|
| Continuous or discontinuous filaments<br>Rovings | 1 specimen  |
| Chopped strands<br>Milled fibres                 | 1 specimen  |
| Woven fabrics<br>Mats                            | 3 specimens per metre width, spaced evenly across the width |

The product specification or the person requesting the determination may stipulate that the determination be performed on a (specified) higher number of specimens which are generally taken from adjacent positions in the elementary unit or laboratory sample.

Moreover, it may be stipulated that the determination be repeated at different places within the elementary unit or laboratory sample.

## 7 Conditioning and test atmosphere

For products which are expected to have a moisture content below 0,2 %, condition the elementary unit or laboratory sample in a standard atmosphere as defined in ISO 291 for a time sufficient to reach equilibrium, usually a minimum of 6 h.

For products with a moisture content in excess of 0,2 %, carry out the determination rapidly after sampling, storing the elementary units or laboratory samples in a hermetically sealed container.

The material may be brought to standard temperature in the container prior to testing, but shall be sealed against moisture loss.

In addition, the sample shall, if applicable, be remixed within the container just prior to testing to avoid erroneous results which occur due to layering of the moisture within the material.

2) The elementary unit (as defined in ISO 1886:1990, *Reinforcement fibres — Sampling plans applicable to received batches*) is the smallest normally commercially available entity of a given product.

3) A laboratory sample is a part of the elementary unit from which the specimen(s) will be selected for the test. A laboratory sample is taken when it is impractical to bring the elementary unit into the test laboratory.