TC 61

INTERNATIONAL STANDARD ISO 3344

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Textile glass products — Determination of moisture content

Produits en verre textile — Détermination du taux d'humidité

First edition — 1977-08-01

UDC 666.189.2 : 543.712 **Ref. No. ISO 3344-1977 (E)**

Descriptors : textile glass, determination of content, water, tests, humidity.

Price based on 3 pages

FOREWORD

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3344 was developed by Technical Committee ISO/TC 61, *Plastics*, and was circulated to the member bodies in November 1975.

It has been approved by the member bodies of the following countries :

Australia	Hungary	Romania
Austria	India	Spain
Belgium	Iran	Sweden
Brazil	Israel	Switzerland
Canada	Italy	Turkey
Czechoslovakia	Japan	United Kingdom
Finland	Netherlands	U.S.A.
France	New Zealand	U.S.S.R.
Germany	Poland	

No member body expressed disapproval of the document.

Printed in Switzerland

Textile glass products — Determination of moisture content

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for determining the moisture content of textile glass products such as continuous filament yarns, staple fibre yarns, rovings, chopped strands, mats, glass fabrics and other textile glass reinforcements.

2 DEFINITION

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

moisture content : The mass of water removed under defined conditions, related to the mass of the undried product. It is expressed as a percentage.

3 REFERENCES

ISO 139, *Textiles — Standard atmospheres for conditioning and testing.*

ISO 291, *Plastics — Standard atmospheres for conditioning and testing.* [1]

ISO 1886, *Textile glass products — Continuous filament yarns, staple fibre yarns and rovings in the form of packages — Sampling of batches or consignments.*

4 PRINCIPLE

Weighing of specimens, at standard room temperature, before and after drying at a standard temperature of 105 ± 2 °C. In the case of products having a textile size, the standard temperature shall be 80 ± 2 °C.

NOTE — In the case of textile glass products containing components which are volatile or susceptible to change at these temperatures, a temperature lower than these standard temperatures may be chosen by agreement between the interested parties; this temperature shall be at least 50 °C. Maintain the chosen temperature to ± 2 °C.

5 APPARATUS

5.1 Ventilated drying oven with an air change rate of 20 to 50 times per hour, capable of maintaining a temperature of 105 ± 2 °C or 80 ± 2 °C or the chosen temperature ± 2 °C (see clause 4).

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

5.3 Specimen container which provides optimum air circulation around the specimen, made from a heat-resistant material and such that there is no loss of the test product. This may be a porcelain crucible, a basket constructed from stainless steel wire mesh, or some other suitable container.

5.4 Stainless steel tongs for handling the specimen and container.

5.5 Balance, sensitive to 0,1 mg.

5.6 Polished metal templates for preparing the specimens.

5.6.1 For glass mats, the recommended shape is a square of side 316 ± 1 mm. Other shapes may be used (see 6.4.2).

5.6.2 For glass fabrics the recommended shape is a rectangle 150 ± 1 mm × 80 ± 1 mm.

5.7 Suitable cutting device, for example a knife, scissors or a cutting disc (for glass fabrics and mats).

6 TEST SPECIMENS

6.1 Yarns

6.1.1 *Sampling*

The number of packages to be taken from one homogeneous consignment shall be in accordance with ISO 1886.

6.1.2 *Preparation of test specimens*

Unwind and discard the external layer of the package and then for each test specimen take a length of yarn with a mass of at least 5 g. Test specimens used in this test may be used for later determination of the linear density.

6.1.3 *Number of test specimens*

At least three test specimens shall be taken from each package.

1) At present at the stage of draft. (Revision of ISO/R 291-1963.)

6.1.4 *Small samples*

Should the sample to be tested be of such small size it is not possible to select several test specimens or even one test specimen of at least 5 g, the procedure given in clause 7 may be used but the results thus obtained will only be indicative.

6.2 Chopped strands or milled fibres

6.2.1 *Sampling*

The sampling procedure shall be in accordance with ISO 1886.

6.2.2 *Preparation of test specimen*

Each specimen shall consist of a quantity of material at least 5 g in mass.

6.2.3 *Number of test specimens*

At least three test specimens shall be taken from each sample.

6.3 Glass fabrics

6.3.1 *Sampling*

The number of rolls to be taken from one homogeneous consignment shall be in accordance with ISO 1886.

6.3.2 *Preparation of test specimens*

Each specimen shall consist of a piece of fabric 150 mm × 80 mm or of similar dimensions, compatible with the test equipment (muffle, balance). It shall be selected at a distance of at least 10 mm from the edges and the selvedges of the fabric. If folding of the specimen is necessary, it shall not prevent a good air circulation over the whole specimen surface. The edges of the specimens shall be fringed to a depth of about 5 mm in order to avoid subsequent loss of yarns. If the mass of such test specimens is less than 5 g, use pieces of larger dimensions.

6.3.3 *Number of test specimens*

At least five test specimens shall be taken from each sample roll.

6.4 Glass mats

6.4.1 *Sampling*

The number of rolls to be taken from one homogeneous consignment shall be in accordance with ISO 1886.

6.4.2 *Preparation of test specimens*

The recommended shape of each test specimen is a 316 mm square of at least 5 g. If the mass of a 316 mm square is less than 5 g, take as many 316 mm specimens as necessary to achieve this minimum mass.

NOTE – Other shapes may be used as long as their surface area is 0,1 m^2, for example test specimen of 400 mm × 250 mm. In this case it is necessary to modify slightly the preparation described below.

Cut a strip of at least 316 mm width from across the whole width of the roll. By means of the template (5.6) and the cutting device (5.7) cut from this strip :

– at each edge (in the case of mats with trimmed edges at least 10 mm inside the edges), a test specimen of 316 mm × 316 mm;

– between these end specimens as many test specimens of 316 mm × 316 mm as the remaining width allows. These test specimens shall be evenly distributed.

If folding of the test specimen is necessary, it shall not prevent good air circulation around the whole of the test specimen.

6.4.3 *Number of test specimens*

The minimum number of test specimens taken from a roll shall be fixed by agreement between purchaser and supplier.

7 PROCEDURE

7.1 Weighing of container

Stabilize the mass of the container by placing it in the oven (5.1) controlled at the standard temperature of 105 ± 2 °C or 80 ± 2 °C, or at the chosen temperature ± 2 °C (see clause 4).

Cool in the desiccator (5.2) to the appropriate standard temperature chosen from those given in ISO 291 and ISO 139.

Weigh the container (5.3) to an accuracy of 1 mg; let m_0 be the mass, in grams, of the container.

7.2 Weighing of undried test specimen with container

Immediately after cutting the test specimen, place it in the container.

Weigh the test specimen with its container on the balance (5.5) to an accuracy of 1 mg; let m_1 be the mass, in grams, of the undried specimen with container.

7.3 Weighing of dried test specimen with container

Put the test specimen with its container into the oven (5.1) at the temperature of 105 ± 2 °C or 80 ± 2 °C, or at the chosen temperature ± 2 °C (see clause 4). Heat the test specimen for at least 1 h for the mass of the test specimen to achieve equilibrium.

Remove the specimen with its container from the oven, place it immediately in the desiccator (5.2) and cool it in the desiccator at standard room temperature until the weighing and at least for 30 min (see ISO 291 and ISO 139).

Weigh the test specimen with its container to an accuracy of 1 mg on the balance (5.5). Further dry the specimen at the chosen temperature for 10 min only, then weigh after recooling in the desiccator. Repeat this operation until two successive weighings do not differ by more than 1 mg; let m_2 be the mass, in grams, of the dried test specimen with its container.

7.4 Precautions to be taken during the determination

Ensure that the test specimens do not come into contact with the oven walls.

Never touch test specimens with the fingers, but use the tongs (5.4).

8 EXPRESSION OF RESULTS

Calculate the moisture content of each test specimen by means of the formula

$$H = \frac{m_1 - m_2}{m_1 - m_0} \times 100$$

where

m_0 is the mass, in grams, of the container;

m_1 is the initial mass (container plus undried test specimen), in grams;

m_2 is the final mass, in grams, after drying (container plus dried test specimen).

The average percentage moisture of the sample is the arithmetic mean of the moisture percentage of the test specimens comprising the sample.

9 TEST REPORT

The test report shall include the following particulars :

a) reference to this International Standard;

b) complete reference to the textile glass product tested;

c) the type of test specimen container used;

d) the standard temperature of the weighing room;

e) the temperature of drying;

f) the dimensions of the test specimens;

g) the number of test specimens tested;

h) the moisture content of each test specimen and of the sample;

i) details of procedure not provided for in this International Standard and any incidents liable to have influenced the results.