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Manufactured articles filled with feather and down - Method for determining the compressibility index of clothing

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Fertigartikel gefüllt mit Federn und Daunen - Verfahren zur Bestimmung der Kompressibilitätsindex von Kleidung

Articles manufacturés garnis avec des plumes et duvets - Méthode pour déterminer l'indice de compressibilité des vetements

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61.020	Oblaļ ila	Clothes

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 222 "Feather and down as filling material for any article, as well as finished articles filled with feather and down ", the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by April 2002, and conflicting national standards shall be withdrawn at the latest by April 2002.

Annex A is normative.

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.

1 Scope

This European standard specifies a method to determine the compressibility index of clothing filled solely with feathers and/or downs.

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 (including amendments).

EN 1883 Feather and down - Sampling in view of tests

EN 12130 Feather and down – Test methods - Determination of the filling power (massic volume)

EN 20139 Textiles - Standard atmospheres for conditioning and testing (ISO 139:1973)

EN 20187 Paper, board and pulps - Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples (ISO 187:1990)

3 Terms and definitions

For the purposes of this standard, the following terms and definitions apply.

3.1

residual Volume (V_1)

volume of the clothing in a tube with a specified diameter, under a pressure of 10 kPa

3.2

conventional Volume (V_2)

conventional volume of the filling of a clothing, calculated from the measurement of filling power and the mass of filling contained in the clothing

3.3

compressibility index of clothing (C_I)

difference between the conventional volume and the residual volume divided by conventional volume and expressed as a percentage

4 Principle

A strong pressure is exerted on the clothing and its residual volume is calculated. The conventional volume is calculated from elements of mass of filling and filling power obtained on the filling conditioned.

The compressibility index is then calculated.

NOTE In accordance with this standard, the materials and accessory volume of the clothing is considered as negligible.

5 Apparatus

See Figure A.1. It comprises the following elements :

5.1 Tube (for example in PVC) of (250 ± 1) mm of diameter (*D*) and having at least 500 mm height (*H*). The height of the tube has to be known to the nearest 1 mm.

5.2 Cylinder mass allowing to exert a pressure of (10 ± 0,1) kPa .That cylinder mass can be put in the tube on the clothing with the help of a hoist. The height H_1 of the cylinder has to be known to the nearest 1 mm.

5.3 Graduated rule, allowing to measure height *H*, H_1, H_2 (see Figure A.1).

5.4 Balance with the accuracy of 0,1 g

6 Sampling and conditioning

6.1 Sampling is carried out according to EN 1883.

6.2 Conditioning and testing are undertaken according to EN 20139 and the temperature and relative humidity are measured according to EN 20187.

7 Test procedure

7.1 Position the clothing (see Annex A) inside the tube (5.1) of height *H* and lower the cylinder (5.2). At the end of a period of at least 60 s, record the difference of height between the top of the tube and the top of the cylinder in millimetres with a precision of 1 mm (H_{2a}) with the help of the graduated rule.

7.2 Lift-up the cylinder, remove the clothing of the tube and leave it to rest without strain during 1 h. Repeat the operation described in 7.1 (H_{2b}).

7.3 Calculate the average of results obtained in 7.1 and 7.2 in centimetres with an approximation of 1 mm (H_2) from H_{2a} and H_{2b}.

7.4 Extract all the filling of the clothing and weigh it once conditioned (*M* is the mass of filling expressed to the nearest gram).

7.5 At the end of a period of at least 14 h in conditioned atmosphere, undertake a measurement of filling power according to EN 12130, by expressing the result in cubic decimetre per kilogram (is M_V the result).

8 Calculations

8.1 Calculate the residual height

$$H_r = H - (H_1 + H_2)$$

where:

H_r is the compressed residual height of the clothing expressed in millimetres with an approximation of 1mm.

H is the total height of the tube (5.1) in millimetres to the approximation of 1 mm.

H_1 is the height of the cylinder of pressure (5.2) in millimetres to the approximation of 1 mm.

H_2 is the difference of height between the top of the tube and the top of the cylinder of pressure in millimetres to the approximation of 1 mm.

8.2 Calculate the residual volume of the clothing under load with the formula:

$$V_1 = \frac{3{,}1416 \cdot D^2 \cdot H_r}{4 \cdot 10^6}$$

where:

V_1 is the residual volume of the clothing in cubic decimetres (liters)

D is the diameter of the tube (5.1) in millimetres to the approximation of 1 mm.

H_r is the residual height of the clothing in millimetres to the approximation of 1 mm.

8.3 Calculate the conventional volume expressed in cubic decimetres obtained by undertaking a measure of massic volume (filling power) in accordance with EN 12130 and by using the formula:

$$V_2 = M_r \cdot M$$

where :

V_2 is the conventional volume in cubic decimetres (liters)

M_r is the massic volume (filling power) expressed in cubic decimetres per gram (liters)

M is the total mass of the filling expressed in grams to the nearest 1 gram.

9 Expression of results

Calculate the compressibility index of the clothing by using the formula:

$$C_i = \frac{(V_2 - V_1) \cdot 100}{V_2}$$

where:

C_i is the compressibility index expressed in percentage

V_2 is the conventional volume of the filling of the clothing

V_1 is the residual volume of the clothing

10 Precision

At the moment of drafting this European standard, data on repeatability and reproducibility are not available.

11 Test report

The test report will include, at least, the following information:

a) the reference to this standard;

b) the date and the place of tests;

c) the description and identification of the clothing (mark, name of the producer or the retailer);

d) value C_i of the compressibility index;

e) any deviation from the specified procedure and any unusual features observed during the test.