

# **SLOVENSKI STANDARD**

## **SIST EN 13855-2:2004**

**01-januar-2004**

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### **Manufactured articles solely filled with feathers and down - Measurement of thickness and compressibility of cushions - Part 2: Test method by oscillation**

Manufactured articles solely filled with feathers and down - Measurement of thickness and compressibility of cushions - Part 2: Test method by oscillation

Fertigartikel gefüllt mit Federn und Daunen - Messung der Dicke und Kompressibilität von Kissen - Teil 2: Schwingungsprüfverfahren

Articles manufacturés garnis de plumes et duvets - Mesurage de l'épaisseur et de la compressibilité des coussins - Partie 2: Méthode d'essai par oscillation

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**Ta slovenski standard je istoveten z: EN 13855-2:2003**

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#### **ICS:**

59.040	Pomožni materiali za tekstilije	Textile auxiliary materials
97.160	Tekstilije za dom. Perilo	Home textiles. Linen

**SIST EN 13855-2:2004**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 13855-2**

May 2003

ICS 59.040; 97.140

English version

**Manufactured articles solely filled with feathers and down -  
Measurement of thickness and compressibility of cushions - Part  
2: Test method by oscillation**

Articles manufacturés garnis de plumes et duvets -  
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Dicke und Kompressibilität von Kissen - Teil 2:  
Schwingungsprüfverfahren

This European Standard was approved by CEN on 14 March 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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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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## Foreword

This document (EN 13855-2:2003) 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 November 2003, and conflicting national standards shall be withdrawn at the latest by November 2003.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

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## EN 13855-2:2003 (E)

## 1 Scope

This part 2 defines a method for testing the behaviour to durability of a cushion solely filled with feather and/or down, considered in its primary tick.

## 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 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 European Standard, the following terms and definitions apply:

### 3.1

#### **cushion**

manufactured article of all shapes and sizes inscribable in 60 cm x 60 cm, used to sit on or to lean against or used as a decorative element, consisting of a feather and/or down filling withheld in a primary tick

NOTE A cushion has not to be confused with a pillow, used as a headrest in a bed.

### 3.2

#### **test specimen**

single cushion taken from the sample as presented

### 3.3

#### **primary tick**

piece or pieces of fabric sewn together so as to contain the feather and/or down filling, and giving the cushion its shape

### 3.4

#### **filling**

feather and/or down withheld in the primary tick

### 3.5

#### **durability test**

series of loads applied to a test specimen simulating the stress due to use

### 3.6

#### **deformation**

loss of thickness and caving-in of the test specimen after the test

### 3.7

#### **shaking-up**

manual, lateral compression and levelling of the test specimen so as to restore it to its original shape

## 4 Principle

Repeated vertical compression of the test specimen exerted by a semi-spherical cap, fulfilling at the same time a rotation around a horizontal axis, thus simulating a friction action (see Figure 1). The thickness of the test specimen is recorded before the test. After a series of compression cycles, the caving-in and the loss of thickness after the shaking-up of the test specimen is measured.

## 5 Apparatus

The apparatus (see Figure 2) consists of the following parts:

- a) A chassis consisting of a rigid structure bearing.
- b) A mobile carriage, sliding on guides, consisting of a rigid, punched steel plate, thickness 5 mm, diameter of holes 3 mm, distance between holes 6 mm.
- c) A semi-rigid support consisting of a slab of  $(800 \times 800 \times 200 \pm 5)$  mm of S 55 density polyurethane covered with cotton fabric of  $(190 \pm 5)$  g/m<sup>2</sup>, simulating the base of settees.
- d) Lateral stoppers meant for hindering the base and the test specimen from slipping out of position.
- e) A compression mechanism consisting of a semi-spherical steel cap of  $(500 \pm 10)$  mm diameter,  $(150 \pm 1)$  mm arrow,  $(28,3 \pm 0,1)$  cm bending radius, coated with a double, removable cotton fabric of  $(190 \pm 5)$  g/m<sup>2</sup>. This cap is connected to a carriage sliding within vertical guides by means of two pairs of hinges with horizontal axis, one of which with oblique gliding, allowing a rotation of  $27^\circ$  of the base of the cap in 3 s (see Figure 1). The compression load consists of  $(800 \pm 10)$  N. The lifting of the load is carried out by pneumatic cylinders operating at a constant speed of  $(100 \pm 10)$  mm/s. The lowering of the load is effected by braked fall taking advantage of the cylinders restraint action. The falling speed is fixed in  $(100 \pm 10)$  mm/s.
- f) A stiff steel template, dimension approx.  $(600 \times 600 \pm 5)$  mm with a central hole and four holes located as in Figure 3 to allow the location and marking of the points where measurements are to be made.
- g) A timer, allowing to fix the time of permanence of the load on the test specimen (from 3 s to 60 s).
- h) A cycle counter, allowing to programme the number of cycles.

## 6 Sampling and conditioning

**6.1** Take sample(s) in accordance with EN 1883.

**6.2** Condition the sample(s) in accordance with EN 20139. Temperature and humidity are to be measured in accordance with EN 20187.

## 7 Procedure

**7.1** Locate the central area of the test specimen on which the semi-spherical cap will rest. Use the template (5,f) in order to locate the four peripheral points.

**7.2** Measure the thickness in millimetres of the test specimen at the five points located by the template (5,f).

NOTE In case of a test specimen with an irregular shape the four lateral points should be the most equidistant as possible.

**7.3** Place the mobile carriage (5,b) under the semi-spherical cap (5,e) and measure the distance (*HE*) in millimetres between the rod and the upper face of the support (5,c) at point *E*.

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**7.4** Center the test specimen under the semi-spherical cap on the support (5,c) and measure in millimetres the distances  $h_a$ ,  $h_b$ ,  $h_c$ ,  $h_d$  and  $h_e$  (see Figure 3).

Calculate the initial thickness of the test specimen in millimetres according to the following formula:

$$s_i = HE - \frac{h_a + h_b + h_c + h_d + h_e}{5} \quad (1)$$

where

$s_i$  is the initial thickness of the test specimen.

**7.5** Start the compression test and let the load of  $(800 \pm 10)$  N stand for  $(10 \pm 1)$  s.

**7.6** Carry out the agreed-upon and preselected series of 2 500 compression cycles up to 100 000. After each series of 2 500 compressions, the test specimen is shaken-up and levelled manually five times.

**7.7** Before the last series of agreed-upon compressions measure the caving-in in millimetres according to the following formula:

$$H_c = \frac{h_a + h_b + h_c + h_d}{4} - h'_e \quad (2)$$

where

$H_c$  is the caving-in;

$h'_e$  is the maximum depth of the caving-in.

**7.8** After the shaking-up and levelling operation measure the thickness of the test specimen in millimetres according to the following formula:

$$s_n = HE - \frac{h_a + h_b + h_c + h_d + h_e}{5} \quad (3)$$

$s_n$  is the thickness of the test specimen after "n" series of compression cycles.

## 8 Calculation and expression of results

**8.1** Calculate the mean of the caving-in in millimetres measured after each series of compression cycles ( $H_{cm}$ ).

**8.2** Calculate the loss of thickness in percent for each series of compression cycles according to the following formula:

$$D_h = \frac{s_i - s_n}{s_i} \times 100 \quad (4)$$

where

$D_h$  is the loss of thickness in percent;

$s_i$  is the initial thickness of the test specimen;

$s_n$  is the thickness after "n" series of compression cycles.



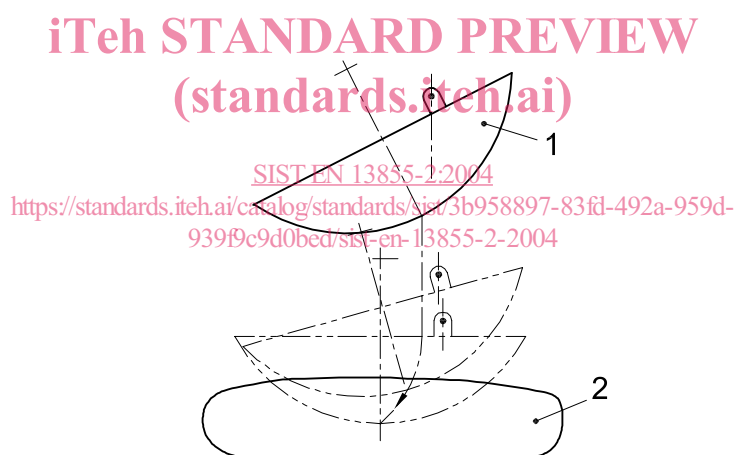
## 9 Precision

At the moment of drafting this European Standard data on repeatability and reproducibility were not available.

## 10 Test report

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

- reference to this standard;
- date and place of the test;
- identification mark of the sample tested;
- number of cycles carried out;
- loss of thickness in percent;
- mean of caving-in checked in millimetres;
- any deviation from the standard procedure and any other circumstances that may have affected the result.



### Key

- 1 Semi-spheric cap
- 2 Test specimen

**Figure 1 – Rotation of 27° of the semi-spheric cap during the compression**