SLOVENSKI STANDARD
SIST EN 13392:2001

01-september-2001

Tekstilije - Monofilamenti - Ugotavljanje dolžinske mase

Textiles - Monofilaments - Determination of linear density

Textilien - Monofilamente - Bestimmung der Feinheit

Textiles - Monofilaments - Détermination de la masse linéique

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ICS:

59.060.20	Umetna vlakna	Man-made fibres

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EUROPEAN STANDARD

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EN 13392

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ICS 59.060.20

English version

Textiles - Monofilaments - Determination of linear density

Textiles - Monofilaments - Détermination de la masse linéique

Textilien - Monofilamente - Bestimmung der Feinheit

This European Standard was approved by CEN on 18 January 2001.

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 248 "Textiles and textile products", the secretariat of which is held by BSI**.**

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of an identical text or by endorsement, at the latest by September 2001, and conflicting national standards shall be withdrawn at the latest by September 2001.

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.

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1   Scope

This European Standard specifies a method for the determination of linear density of monofilaments and gives the method of calculation of the nominal linear density of round monofilaments (see annex A).

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

3   Terms and definitions

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

3.1
monofilament
yarn made with only one filament

3.2
linear density
mass per unit length of a monofilament expressed in tex or its multiples or submultiples

 NOTE 1 tex = 1 g/1000 m.

3.3
tension
a force applied to a test specimen during a test

3.4
nominal diameter
cross dimension of round monofilament and expressed in millimetres

3.5
package
the method of presentation of the monofilament, e.g. spool, tube, cone, etc

4   Principle

Test specimens of suitable length are prepared according to the diameter of the monofilament, conditioned and weighed.

The linear density is calculated from the length and mass of the test specimens and expressed in decitex.

5   Apparatus

5.1   Metering device (wrap reel or rule), capable of measuring the length of monofilament to an accuracy of 0,1 % under a tension of 0,05 cN/dtex ± 10 %. The reel circumferance should be at least 1m.

5.2   Balance, having an appropriate capacity and a sensitivity equal to 0,1 % of the mass of the specimen to be weighed.

6   Sampling and preparation of test specimens

Reject at least the first layer on each package.

Take five specimens per package, each with a length L according to table 1 with an accuracy of 0,1 %. Use an appropriate metering device (5.1) under a tension of 0,05 cN/dtex ± 10 %. For diameters less than 0,5 mm, use a wrap reel and for diameters of 0,5 mm and above use a rule.

NOTE Due to the high stiffness of large diameter monofilaments a wrap reel is not accurate enough to measure L

Table 1

Nominal diameter d mm	Length L m
< 0,08	250
0,08 ≤ d < 0,30	100
0,30 ≤ d < 0,50	10
≥ 0,50	5

7   Conditioning

Condition the test specimens before testing in the standard atmosphere as described in EN 20139, i.e., at the temperature of (20 ± 2) °C and the relative humidity of (65 ± 2) % for a period of at least 24 h.

8 Procedure

Weigh the conditioned test specimens *(m)* on the balance (5.2) with an accuracy of ± 0,1 % in the standard atmosphere. This is the mass *m* in grams.

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9   Expression of results

9.1   For each specimen, calculate the linear density, *T*, in dtex as follows :

$$T = \frac{m}{L} \times 10\ 000$$

where :

m is the mass in grams,

L is the length, in metres, of the test specimen.

Calculate the average value of the five results. If required calculate the standard deviation and the confidence intervals at 95 % of the mean value.

Express the linear density in dtex, as follows:

-to the nearest whole number over 50 dtex ;
-with one decimal digit up to and including 50 dtex.

9.2   Calculate the nominal linear density in accordance with annex A, where applicable.

10   Test report

The test report shall include the following information :

a) a reference to this standard, i.e. EN 13392;

b) an identification of the product tested (diameter, textile material, etc.);

c) the sampling procedure, if required;

d) the linear density, in dtex, according to clause 9;

e) if required the standard deviation and the confidence intervals at 95 % of the mean value;

f) the nominal linear density, in dtex, according to annex A, where applicable;

g) any deviation from this standard which may have affected the results.

Annex A
(normative)

A.1 General

This annex gives a method of calculation of the nominal linear density of round monofilaments when the nominal diameter and the nominal density are known.

A.2 Method of calculation

Calculate the nominal linear density, T_C in dtex, as follows :

$$T_C = \frac{\pi d^2}{4} \; x \; L \; x \frac{\rho}{1\;000} \; = \; \frac{\pi \; L}{4 \; x \; 1\;000} \; x \; d^2 \; x \; \rho \; = \; 7{,}854 \; x \; d^2 \; x \; \rho$$

Where :

$\pi = 3{,}1416$
$L = 10\;000$ m
d = nominal diameter of round monofilament, in mm
ρ = density of polymeric material, in kg/m^3, according to A.3

A.3 Nominal density of polymers

For calculation purposes use the nominal density of polymers as given in table A.1 below.

Table A.1

Polymer	Abbreviation	Density kg/m^3
High density polyethylene	PE-HD	960
Polypropylene	PP	910
Polyamide and copolyamide	PA 6 PA 66 PA 6/66	1140
Polyamide 610	PA 610	1080
Polyamide 12	PA 12	1020
Poly(ethylene terephthalate)	PET [a]	1380
Poly(butylene terephthalate) Polyetheretherketone	PBT PEEK	1300
Poly(phenylene sulfide)	PPS	1350
[a] Referred to as PES in ISO 2076 *Textiles – Man-made fibres – Generic names*		