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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13394

April 2001

ICS 55.040

English version

Packaging - Specification for non-metallic tensional strapping

Conditionnement - Caractéristiques des feuillards de
cerclage non métalliques

Verpackung - Spezifikation für nichtmetallische
Umreifungsbänder

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

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 261 "Packaging", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by October 2001, and conflicting national standards shall be withdrawn at the latest by October 2001.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 dimensions and physical properties for non-metallic strapping used to secure, to close, to unitise or to strengthen packages applied by hand tools or automatic machines.

NOTE For particular applications or specific requirements, other dimensions can be supplied by agreement between customer and supplier.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this European Standard. For dated references, subsequent amendments to, or revisions of, this publication, do not apply. However, parties to agreements based on this European Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the publication referred to applies (including amendments).

EN ISO 1421, *Rubber or plastics-coated fabrics - Determination of tensile strength and elongation at break (ISO 1421:1998)*

EN ISO 2233:1999, *Packaging - Complete, filled transport packages - Conditioning for testing (ISO 2233:1994)*

3 Classification of materials

3.1 Thermoplastics strapping

Strapping produced by extrusion, generally of rectangular cross-section, in which high tensile strength has been developed by orientation.

3.1.1 Polyamide strapping

Extruded and oriented polyamide (PA)

3.1.2 Polypropylene strapping

Extruded and oriented polypropylene (PP)

3.1.3 Polyester strapping

Extruded and oriented polyester (Polyethylene-terephthalate) (PET)

3.2 Textile strapping

Strapping produced from continuous longitudinal strands of textile material.

3.2.1 Polyester textile strapping

Strapping that consists of continuous longitudinal strands of high tensile polyester fibres bonded together with a suitable adhesive or polymer coating forming a non-woven product, or in combination with a weft forming a woven product.

4 General

4.1 Surface finish

Polyamide strapping is flat. Polypropylene and polyester strapping may be either flat or embossed.

4.2 Colour

Non-metallic strapping may be supplied in various colours for identification.

NOTE See Annex A (informative) for preferred colours.

4.3 Recycling

Non-metallic strapping may be recovered, separated and recycled.

The calorific energy of thermoplastic non-metallic strapping may be recovered by incineration.

5 Dimensions and physical properties

5.1 Polyamide

Dimensions and physical properties for polyamide strapping shall be as in Table 1.

Table 1 — Polyamide - Dimensions and physical properties

Nominal width mm	Minimum width mm	Maximum width mm	Minimum break strength N	Range of Elongation at break %	Nominal Thickness Range mm
11	10,95	11,35	1870, 2490, 3110	10 to 20	0,4 to 0,8
12,7	12,55	12,95	1870, 2490, 3110, 4000	10 to 20	0,25 to 0,8

5.2 Polypropylene

Dimensions and physical properties for polypropylene strapping shall be as in Table 2.

Table 2 — Polypropylene - Dimensions and physical properties

Nominal width mm	Minimum width mm	Maximum width mm	Minimum break strength N
5	4,6	5,1	350, 450, 550, 700
5,5	5,1	5,6	500, 650, 800
6	5,6	6,1	400, 600, 800
7	6,5	7,1	700, 850
8	7,5	8,1	600, 700, 900, 1100, 1300
9	8,5	9,1	700, 850, 1000, 1200, 1400, 1600, 1800
10	9,5	10,1	1000, 1250, 1500, 1800
11	10,5	11,1	1100, 1300, 1600, 2000, 2200, 2500, 2800
12	11,3	12,1	1100, 1300, 1500, 1600, 1800, 1900, 2200, 2500, 2800, 3000
12,7	12,0	12,8	1500, 1750, 2000, 2400, 2700, 2800, 3000, 3300, 3500, 3800
15	14,3	15,1	1700, 2000, 2500, 3000, 3500, 4000, 5000
16	15,3	16,1	1700, 1900, 2200, 2500, 2700, 3000, 3500, 4000, 5000
19	18,3	19,1	1600, 3500, 4200, 6000
For hand tool applications the width tolerance shall be $\pm 6\%$ of the nominal width			

5.3 Polyester

Dimensions and physical properties for polyester strapping shall be as in Table 3.

Table 3 — Polyester - Dimensions and physical properties

Nominal width mm	Minimum width mm	Maximum width mm	Minimum break strength N
9,5	9,0	9,6	1800, 2000, 2200, 2500
10	9,5	10,1	2300, 3200
11	10,5	11,1	2100, 2500, 2700, 3200
12	11,3	12,1	2100, 2300, 2600, 2900, 3200, 3500, 4500
12,7	12,0	12,8	2100, 2600, 2900, 3300, 3800
15	14,3	15,1	4300, 5600, 6300, 7100
16	15,3	16,1	2900, 3800, 4800, 5300, 5700, 6500
19	18,3	19,1	7000, 9000, 10000

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5.4 Mechanical properties

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5.4.1 Polypropylene <https://standards.iteh.ai/catalog/standards/sist/2b19799e-008b-42b5-92f4-8c8ee75cf620/sist-en-13394-2002>

Mechanical properties for polypropylene strapping shall be as in Table 4.

Table 4 — Polypropylene - Mechanical properties

Minimum tensile strength MPa	Elongation %	Type
330	12 to 20	I
300	15 to 25	II

5.5 Polyester

Mechanical properties for polyester strapping shall be as in Table 5.

Table 5 — Polyester - Mechanical properties

Minimum tensile strength MPa	Elongation %	Type
510	8 to 15	I
460	12 to 18	II
390	14 to 20	III