INTERNATIONAL STANDARD

ISO 1346

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Fibre ropes — Polypropylene split film, monofilament and multifilament (PP2) and polypropylene high-tenacity multifilament (PP3) — 3-, 4-, 8- and 12-strand ropes

Cordages en fibres — Film fibrillé, monofilament et multifilament de polypropylène (PP2) et multifilament de polypropylène haute ténacité (PP3) — Cordages à 3, 4, 8 et 12 torons

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 1346 was prepared by Technical Committee ISO/TC 38, *Textiles*.

This fourth edition cancels and replaces the third edition (ISO 1346:2004), which has been technically revised.

Fibre ropes — Polypropylene split film, monofilament and multifilament (PP2) and polypropylene high-tenacity multifilament (PP3) — 3-, 4-, 8- and 12-strand ropes

1 Scope

This International Standard specifies requirements for 3-strand hawser-laid and 4-strand shroud-laid ropes, 8-strand braided ropes and 12-strand braided ropes for general service made of polypropylene, and gives rules for their designation.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1968, *Fibre ropes and cordage — Vocabulary*

ISO 2307, *Fibre ropes — Determination of certain physical and mechanical properties*

ISO 9554, *Fibre ropes — General specifications*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1968 apply.

4 Designation

Fibre ropes shall be designated by

— the words "fibre rope",

— the number of this International Standard,

— the construction or type of rope (see Clause 5),

— the reference number of the rope,

— the material from which the rope is made:

— PP2: polypropylene split film, monofilament and multifilament,

— PP3: polypropylene high-tenacity multifilament.

EXAMPLE

Designation of an 8-strand braided rope (type L) with a linear density of 1 630 ktex, corresponding to the reference number 60 and made of polypropylene monofilament (PP2):

Fibre rope ISO 1346 – L – 60 – PP2

5 General requirements

5.1 Polypropylene ropes shall be made in one of the following constructions:

— type A: 3-strand hawser-laid rope (see Figure 1);

— type B: 4-strand shroud-laid rope (see Figure 2);

— type L: 8-strand braided rope (see Figure 3);

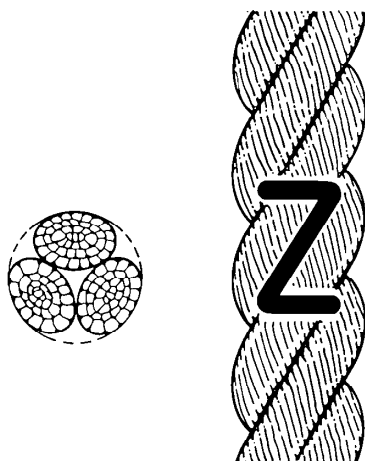— type T: 12-strand braided rope (see Figure 4).

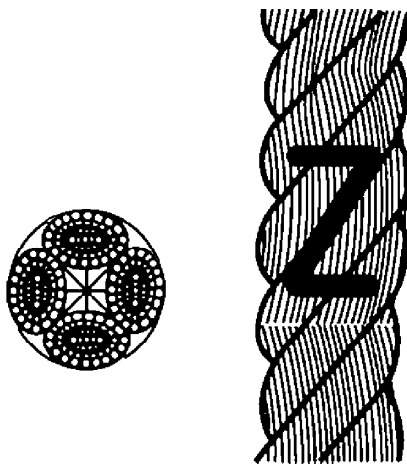**Figure 1 — Shape of a 3-strand hawser-laid rope (type A)**

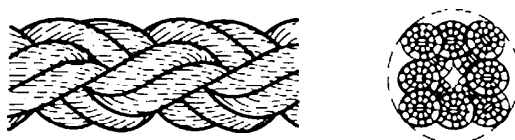**Figure 2 — Shape of a 4-strand shroud-laid rope (type B)**

Figure 3 — Shape of an 8-strand braided rope (type L)

Figure 4 — Shape of a 12-strand braided rope (type T)

5.2   Construction, manufacture, lay, labelling, packaging, invoicing and delivery lengths shall in accordance with ISO 9554.

6   Physical properties

Linear density and minimum breaking force shall be in accordance with Tables 1, 2 and 3.

Table 1 —Linear density and minimum breaking force (MBF)
of 3-strand hawser-laid polypropylene ropes, type A

Reference number [a]	Linear density [b] [c]		Minimum breaking force [d] [e]			
			kN			
			Split/Mono/		High-tenacity	
	Nominal	Tolerance	Multi PP2		Multi PP3	
	ktex	%	Unspliced ropes	Ropes with eye-spliced terminations	Unspliced ropes	Ropes with eye-spliced termina-tions
4	7,23		2,80	2,52	3,15	2,84
4,5	9,15		3,55	3,20	4,00	3,60
5	11,3	±10	4,25	3,83	4,75	4,28
6	16,3		6,00	5,40	6,70	6,03
8	28,9		10,0	9,00	11,8	10,6
9	36,6		12,5	11,3	14,0	12,6
10	45,2		15,0	13,5	17,0	15,3
12	65,1	±8	21,2	19,1	25,0	22,5
14	88,6		28,0	25,2	33,5	30,2
16	116		37,5	33,8	42,5	38,3
18	146		45,0	40,5	53,0	47,8
20	181		56,0	50,4	63,0	56,7
22	219		67,0	60,3	75,0	67,5
24	260		80,0	72,0	90,0	81,0
26	306		90,0	81,0	106	95,4
28	354		106	95,4	118	106
30	407		118	106	132	119
32	463		132	119	150	135
36	586		170	153	190	171
40	723	±5	200	180	236	212
44	875		250	225	280	252

Table 1 (continued)

Reference number [a]	Linear density [b c]		Minimum breaking force [d e]			
			kN			
			Split/Mono/ Multi PP2		High-tenacity Multi PP3	
	Nominal ktex	Tolerance %	Unspliced ropes	Ropes with eye-spliced terminations	Unspliced ropes	Ropes with eye-spliced termina-tions
48	1 040		280	252	335	302
52	1 220		335	302	375	338
56	1 420		375	338	425	383
60	1 630		425	383	500	450
64	1 850		500	450	560	504
72	2 340		600	540	710	639
80	2 890		750	675	850	765
88	3 500	±5	900	810	1 000	900
96	4 170		1 060	954	1 180	1 062
104	4 890		1 250	1 125	1 400	1 260
112	5 670		1 400	1 260	1 600	1 440
120	6 510		1 600	1 440	1 800	1 620
128	7 410		1 800	1 620	2 000	1 800
136	8 360		2 000	1 800	2 240	2 016
144	9 370		2 240	2 016	2 500	2 250
160	11 600		2 800	2 520	3 000	2 700

[a] The reference number corresponds to the approximate diameter, in millimetres.

[b] The linear density, in kilotex, corresponds to the net mass per length of rope, expressed in grams per metre or in kilograms per thousand metres.

[c] The linear density is under reference tension and is measured as specified in ISO 2307.

[d] The breaking forces quoted in this table relate to new dry and wet ropes.

[e] A force determined by the test methods specified in ISO 2307 is not necessarily an accurate indication of the force at which that rope might break in other circumstances and situations. The type and quality of the termination rate of force application, prior conditioning and previous force applications to the rope can significantly influence the breaking force. A rope bent around a post, capstan, pulley or sheave might break at a significantly lower force. A knot or other distortion in a rope might significantly reduce the breaking force.

**Table 2 —Linear density and minimum breaking force (MBF)
of 4-strand shroud-laid polypropylene ropes, type B**

Reference number [a]	Linear density [b][c]		Minimum breaking force [d][e] kN			
	Nominal	Tolerance	Split/Mono/ Multi PP2		High-tenacity Multi PP3	
	ktex	%	Unspliced ropes	Ropes with eye-spliced terminations	Unspliced ropes	Ropes with eye-spliced termina-tions
10	45,2		14,0	12,6	16,0	14,4
12	65,1	±8	19,0	17,1	22,4	20,2
14	88,6		26,5	23,9	30,0	27,0
16	116		33,5	30,2	37,5	33,8
18	146		45,0	40,5	47,5	42,8
20	181		53,0	47,7	60,0	54,0
22	219		60,0	54,0	71,0	63,9
24	260		71,0	63,9	80,0	72,0
26	306		80,0	72,0	95,0	85,6
28	354		95,0	85,5	106	95,4
30	407		106	95,4	125	113
32	463		125	113	140	126
36	586		150	135	170	153
40	723	±5	180	162	212	191
44	875		224	202	250	225
48	1 040		250	225	300	270
52	1 220		300	270	335	302
56	1 420		335	302	400	360
60	1 630		400	360	450	405
64	1 850		450	405	500	450
72	2 340		560	504	630	567
80	2 890		670	603	750	675
88	3 500		800	720	900	810
96	4 170		950	855	1 060	954
104	4 890		1 120	1 008	1 250	1 125
112	5 670		1 250	1 125	1 400	1 260
120	6 510		1 400	1 260	1 600	1 440
128	7 410		1 600	1 440	1 800	1 620
136	8 360		1 800	1 620	2 000	1 800
144	9 370		2 000	1 800	2 240	2 016

Table 2 *(continued)*

Reference number [a]	Linear density [b] [c]		Minimum breaking force [d] [e] kN			
	Nominal ktex	Tolerance %	Split/Mono/ Multi PP2		High-tenacity Multi PP3	
			Unspliced ropes	Ropes with eye-spliced terminations	Unspliced ropes	Ropes with eye-spliced termina-tions
160	11 600	±5	2 500	2 250	2 800	2 520

[a] The reference number corresponds to the approximate diameter, in millimetres.

[b] The linear density, in kilotex, corresponds to the net mass per length of rope, expressed in grams per metre or in kilograms per thousand metres.

[c] The linear density is under reference tension and is measured as specified in ISO 2307.

[d] The breaking forces quoted in this table relate to new dry and wet ropes.

[e] A force determined by the test methods specified in ISO 2307 is not necessarily an accurate indication of the force at which that rope might break in other circumstances and situations. The type and quality of the termination rate of force application, prior conditioning and previous force applications to the rope can significantly influence the breaking force. A rope bent around a post, capstan, pulley or sheave might break at a significantly lower force. A knot or other distortion in a rope might significantly reduce the breaking force.

Table 3 —Linear density and minimum breaking force (MBF)
of 8-strand and 12-strand braided polypropylene ropes, types L and T

Reference number [a]	Linear density [b] [c]		Minimum breaking force [d] [e] kN			
	Nominal ktex	Tolerance %	8 strands		12 strands	
			Unspliced ropes	Ropes with eye-spliced terminations	Unspliced ropes	Ropes with eye-spliced terminations
12	65,1	±8	21,2	19,1	22,4	20,2
16	116		33,5	30,2	35,5	32,0
20	181		53	47,7	56	50,4
24	260		75	67,5	80	72,0
28	354		100	90,0	106	95,4
30	407		112	101	118	106
32	463		132	119	140	126
36	586		160	144	170	153
40	723		200	180	210	189
44	875		236	212	250	225
48	1 040		280	252	300	270
52	1 220		335	302	355	320
56	1 420	±5	375	338	400	360
60	1 630		425	383	450	405
64	1 850		475	428	500	450
72	2 340		600	540	630	567
80	2 890		750	675	800	720
88	3 500		900	810	950	855
96	4 170		1 060	954	1 120	1 008

Table 3 *(continued)*

| Reference number [a] | Linear density [b] [c] | | Minimum breaking force [d] [e] kN | | | |
| | Nominal ktex | Tolerance % | 8 strands | | 12 strands | |
			Unspliced ropes	Ropes with eye-spliced terminations	Unspliced ropes	Ropes with eye-spliced terminations
104	4 890		1 250	1 125	1 320	1 188
112	5 670		1 400	1 260	1 500	1 350
120	6 510		1 600	1 440	1 700	1 530
128	7 410	±5	1 900	1 710	2 000	1 800
136	8 360		2 120	1 908	2 240	2 016
144	9 370		2 360	2 124	2 500	2 250
160	11 600		2 800	2 520	3 000	2 700

[a] The reference number corresponds to the approximate diameter, in millimetres.

[b] The linear density, in kilotex, corresponds to the net mass per length of rope, expressed in grams per metre or in kilograms per thousand metres.

[c] The linear density is under reference tension and is measured as specified in ISO 2307.

[d] The breaking forces quoted in this table relate to new dry and wet ropes.

[e] A force determined by the test methods specified in ISO 2307 is not necessarily an accurate indication of the force at which that rope might break in other circumstances and situations. The type and quality of termination rate of force application, prior conditioning and previous force applications to the rope can significantly influence the breaking force. A rope bent around a post, capstan, pulley or sheave might break at a significantly lower force. A knot or other distortion in a rope might significantly reduce the breaking force.

NOTE   The relation between the minimum breaking force (MBF) and the reference number (RN) is given by the following formula:

$RN = 2{,}511 \times MBF^{0{,}523}$ for unspliced 8-strand ropes

$RN = 2{,}440 \times MBF^{0{,}523}$ for unspliced 12-strand ropes

7 Marking

The marking shall be carried out in accordance with ISO 9554.

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