INTERNATIONAL STANDARD

ISO 1140

Fourth edition
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Fibre ropes — Polyamide — 3-, 4-, 8- and 12-strand ropes

Cordages en fibres — Polyamide — Cordages à 3, 4, 8 et 12 torons

Reference number
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Contents

Page

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 1140 was prepared by Technical Committee ISO/TC 38, *Textiles*.

This fourth edition cancels and replaces the third edition (ISO 1140:2004), which has been technically revised.

Fibre ropes — Polyamide — 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 polyamide, 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 (the mixing of polyamide fibre types and grades shall not be permitted), and

— the type of stabilization (1 or 2 in accordance with ISO 9554).

Polyamide-laid ropes that are required to have a heat setting on the rope to ensure lay and dimensional stability are designated as type 1 ropes. In other cases, polyamide-laid ropes that are not required to have a heat setting on the rope are designated as type 2 ropes.

EXAMPLE

Designation of a 3-strand hawser-laid rope heat set (type 1), reference number 20 (type A), corresponding to a linear density of 247 ktex and made of polyamide (PA):

Fibre rope ISO 1140 – A – 20 – PA – 1

5 General requirements

5.1 Polyamide 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).

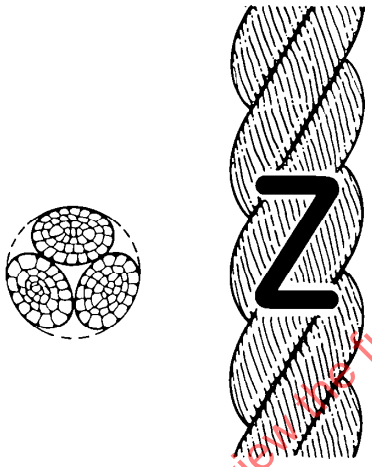

Figure 1 — Shape of a 3-strand hawser-laid rope (type A)

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

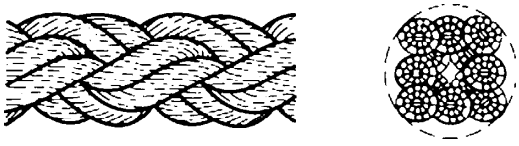

Figure 3 — Shape of an 8-strand braided rope (type L)

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

5.2 Construction, manufacture, lay, labelling, packaging, invoicing and delivery lengths shall be 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 polyamide ropes, type A

Reference number [a]	Linear density [b c]		Minimum breaking force [d e] kN	
	Nominal ktex	Tolerance %	Unspliced ropes	Ropes with eye-spliced terminations
4	9,87	±10	3,75	3,38
4,5	12,5		4,50	4,05
5	15,4		5,60	5,04
6	22,2		8,00	7,20
8	39,5		14,0	12,6
9	50,0		17,0	15,3
10	61,7	±8	21,2	19,1
12	88,8		30,0	27,0
14	121		40,0	36,0
16	158	±5	50,0	45,0
18	200		63,0	56,7
20	247		80,0	72,0
22	299		95,0	85,5
24	355		112	101
26	417		125	113
28	484		150	135
30	555		170	153
32	632		190	171
36	800		236	212
40	987		300	270
44	1 190		355	320
48	1 420		400	360
52	1 670		475	428
56	1 930		560	504
60	2 220		630	567

Table 1 *(continued)*

Reference number [a]	Linear density [b c]		Minimum breaking force [d e] kN	
	Nominal ktex	Tolerance %	Unspliced ropes	Ropes with eye-spliced terminations
64	2 530	±5	710	639
72	3 200		900	810
80	3 950		1 060	954
88	4 780		1 320	1 188
96	5 690		1 500	1 350
104	6 670		1 800	1 620
112	7 740		2 000	1 800
120	8 880		2 360	2 124
128	10 100		2 650	2 385
136	11 400		3 000	2 700
144	12 800		3 350	3 015
160	15 800		4 000	3 600

[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 ropes. In wet conditions, the breaking force will be lower.

[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 polyamide ropes, type B

Reference number [a]	Linear density [b c]		Minimum breaking force [d e] kN	
	Nominal ktex	Tolerance %	Unspliced ropes	Ropes with eye-spliced terminations
10	61,7	±8	19,0	17,1
12	88,8		28,0	25,2
14	121		35,5	31,9
16	158	±5	47,5	42,8
18	200		56,0	50,4
20	247		71,0	63,9
22	299		85,0	76,5
24	355		100	90,0
26	417		118	106
28	484		132	119
30	555		150	135
32	632		170	153
36	800		212	191

Table 2 *(continued)*

Reference number [a]	Linear density [b c]		Minimum breaking force [d e] kN	
	Nominal ktex	Tolerance %	Unspliced ropes	Ropes with eye-spliced terminations
40	987	±5	265	239
44	1 190		315	284
48	1 420		375	338
52	1 670		425	383
56	1 930		500	450
60	2 220		560	504
64	2 530		630	567
72	3 200		800	720
80	3 950		950	855
88	4 780		1 180	1 062
96	5 690		1 400	1 260
104	6 670		1 600	1 440
112	7 740		1 900	1 710
120	8 880		2 120	1 908
128	10 100		2 360	2 124
136	11 400		2 650	2 385
144	12 800		3 000	2 700
160	15 800		3 550	3 195

[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 ropes. In wet conditions, the breaking force will be lower.

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Table 3 —Linear density and minimum breaking force (MBF) of 8 and 12-strand braided polyamide 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	90,0	±8	30,0	27,0	31,5	28,4
16	160		53,0	47,7	56	50,4
20	250	±5	80,0	72,0	85	76,5
24	360		112	101	118	106
28	490		150	135	160	144