INTERNATIONAL STANDARD

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Fibre ropes — Polyester — 3-, 4-, 8- and 12-strand ropes

Cordages en fibres — Polyester — 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 1141 was prepared by Technical Committee ISO/TC 38, *Textiles* .

This fourth edition cancels and replaces the third edition (ISO 1141:2004), which has been technically revised.

Fibre ropes — Polyester — 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 polyester, 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, and

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

Polyester-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, polyester-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 30 (type A), corresponding to a linear density of 682 ktex and made of polyester (PES):

Fibre rope ISO 1141 – A – 30 – PES – 1

5   General requirements

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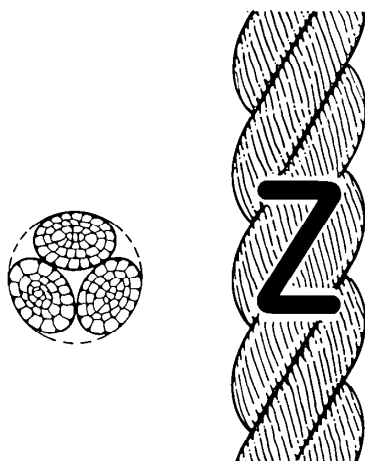
— type T: 12-strand braided rope (see Figure 4).

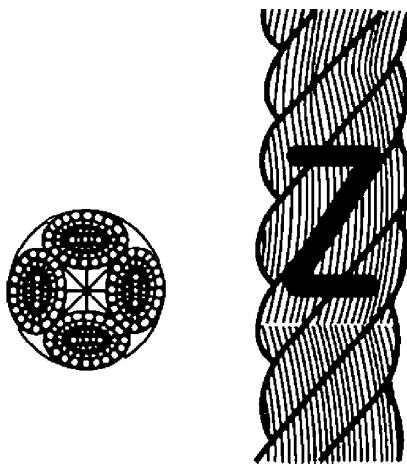

Figure 1 — Shape of a 3-strand hawser-laid rope (type A)
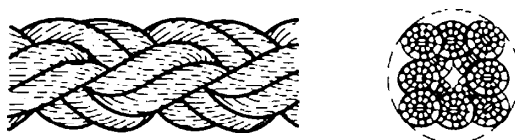

Figure 2 — Shape of a 4-strand shroud-laid rope (type B)

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 polyester ropes, type A**

Reference number [a]	Linear density [b] [c]		Minimum breaking force [d] [e] kN	
	Nominal	Tolerance		
	ktex	%	Unspliced ropes	Ropes with eye-spliced terminations
4	12,1		2,80	2,52
4,5	15,3		3,51	3,19
5	19,0	±10	4,25	3,82
6	27,3		6,00	5,40
8	48,5		10,6	9,54
9	61,4		13,2	11,88
10	75,8		16,0	14,4
12	109	±8	22,4	20,2
14	149		30,0	27,0
16	194		40,0	36,0
18	246		50,0	45,0
20	303		60,0	54,0
22	367		71,0	63,9
24	437		85,0	76,5
26	512		100	90,0
28	594		118	106
30	682		132	119
32	776		150	135
36	982		190	171
40	1 210	±5	236	212
44	1 470		280	252
48	1 750		335	302
52	2 050		375	338
56	2 380		425	383
60	2 730		500	450
64	3 100		560	504

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Table 1 *(continued)*

Reference number [a]	Linear density [b c]		Minimum breaking force [d e] kN	
	Nominal	Tolerance		
	ktex	%	Unspliced ropes	Ropes with eye-spliced terminations
72	3 930		710	639
80	4 850		850	765
88	5 870		1 060	954
96	6 990		1 250	1 125
104	8 200		1 400	1 260
112	9 510	±5	1 600	1 440
120	10 900		1 900	1 710
128	12 400		2 120	1 908
136	14 000		2 360	2 124
144	15 700		2 650	2 385
160	19 400		3 350	3 015

[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 polyester ropes, type B**

Reference number [a]	Linear density [b c]		Minimum breaking force [d e] kN	
	Nominal	Tolerance		
	ktex	%	Unspliced ropes	Ropes with eye-spliced terminations
6	27,3	±10	5,60	5,04
8	48,5		9,50	8,55
10	75,8		15,0	13,5
12	109	±8	21,2	19,1
14	149		28,0	25,2
16	194		35,5	32,0
18	246		45,0	40,5
20	303		56,0	50,4
22	367		67,0	60,3
24	437	±5	80,0	72,0
26	512		90,0	81,0
28	594		106	95,4
30	682		118	106
32	776		132	119

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
36	982		170	153
40	1 210		212	191
44	1 470		250	225
48	1 750		300	270
52	2 050	±5	335	302
56	2 380		400	360
60	2 730		450	405
64	3 100		500	450
72	3 930		630	567
80	4 850		800	720
88	5 870		950	855
96	6 990		1 120	1 008
104	8 200		1 320	1 188
112	9 510		1 500	1 350
120	10 900		1 700	1 530
128	12 400		1 900	1 710
136	14 000		2 120	1 908
144	15 700		2 360	2 124
160	19 400		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 3 —Linear density and minimum breaking force (MBF)
of 8-strand and 12-strand braided polyester 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	109	±8	23,0	20,7	25,0	22,5
16	194		40,0	36,0	42,5	38,3
20	304		63,0	56,7	67,0	60,3
24	437		90,0	81,0	95,0	85,5
28	595		118	106	125	113
30	683		132	119	140	126
32	777		150	135	160	144
36	984		190	171	200	180
40	1 210		236	212	250	225
44	1 470		280	252	300	270
48	1 750		335	302	355	320
52	2 050		400	360	425	383
56	2 380	±5	450	405	475	428
60	2 730		500	450	530	477
64	3 110		560	504	600	540
72	3 930		710	639	750	675
80	4 860		900	810	950	855
88	5 880		1 060	954	1 120	1 008
96	6 990		1 250	1 125	1 320	1 188
104	8 210		1 500	1 350	1 600	1 440
112	9 520		1 700	1 530	1 800	1 620
120	10 900		1 900	1 710	2 000	1 800
128	12 400		2 240	2 016	2 360	2 124
136	14 000		2 500	2 250	2 650	2 385
144	15 700		2 800	2 520	3 000	2 700
160	19 400		3 350	3 015	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.

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[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.

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

RN = 2,349 × MBF^{0,520} for unspliced 8-strand ropes

RN = 2,265 × MBF^{0,520} for unspliced 12-strand ropes

7   Marking

Type 1 ropes (reference number less than 14) shall be marked using a blue thread. For other ropes, the marking shall be in accordance with ISO 9554.

ICS 59.080.50

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