INTERNATIONAL STANDARD

ISO 1141

Fifth edition
2021-04

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

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This fifth edition cancels and replaces the fourth edition (ISO 1141:2012), which has been technically revised.

The main changes compared to the previous edition are as follows:

— in the Scope, a statement specifying that the document does not cover all variations in strength or product performance has been added;

— in Clause 3, the term "minimum breaking strength" has been added;

— in Table 1, Table 2 and Table 3, the tolerances in linear density have been modified.

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

1 Scope

This document 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.

This document does not cover all variations in strength or product performance. The rope manufacturer is consulted to ensure the intended design meets the requirements of the application.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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*

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3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
minimum breaking strength
MBS
force a fibre rope shall at least achieve when tested following a recognized procedure/test method

Note 1 to entry: The MBS is set by each manufacturer, as per their own internal statistical methods based on breaking tests. In ISO 9554:2019, Annex D, two statistical methods are given that can be used to determine the MBS.

[SOURCE: ISO 9554:2019, 3.2]

4 Designation

Fibre ropes shall be designated by

— the words “fibre rope”,

— the number of this document, i.e. ISO 1141,

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

— the reference number of the rope,

— the material from which the rope is made, and

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

Polyester-laid ropes that are required to have a heat setting 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 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).

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

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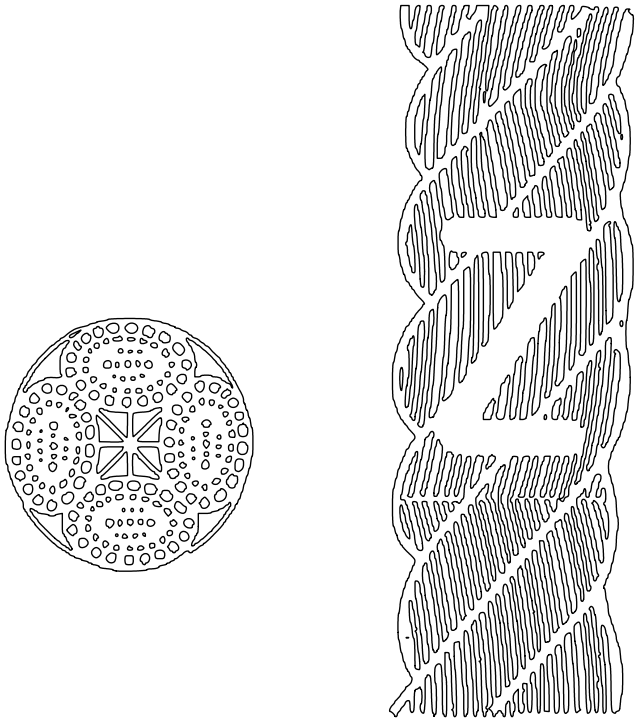

Figure 2 — Shape of a 4-strand shroud-laid rope (type B)

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

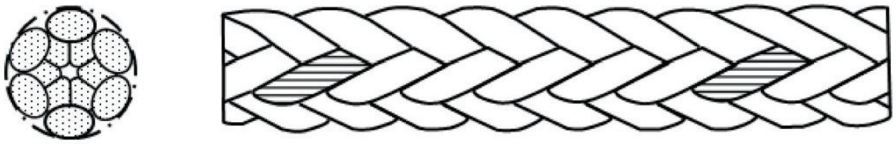

Figure 4 — Shape of a 12-strand braided rope (type T)

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 strength shall be in accordance with Table 1, Table 2 and Table 3.

Regarding Table 1, Table 2 and Table 3, the following applies.

— The reference number corresponds to the approximate diameter, in millimetres.

— 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.

— The linear density is under reference tension and shall be measured as specified in ISO 2307.

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— The breaking strengths quoted in these tables relate to new dry and wet ropes.

— 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 strength. 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 will significantly reduce the breaking strength

Table 1 — Linear density and minimum breaking strength (MBS) of 3-strand hawser-laid polyester ropes, type A

Reference number	Linear density		Minimum breaking strength kN	
	Nominal ktex	Tolerance %	Unspliced ropes	Ropes with eye-spliced terminations
4	12,1	±10	2,80	2,52
4,5	15,3		3,51	3,19
5	19,0		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		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	±8	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

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Table 1 *(continued)*

Reference number	Linear density		Minimum breaking strength kN	
	Nominal ktex	Tolerance %	Unspliced ropes	Ropes with eye-spliced terminations
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
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		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

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Table 2 — Linear density and minimum breaking strength (MBS) of 4-strand shroud-laid polyester ropes, type B

Reference number	Linear density		Minimum breaking strength kN	
	Nominal ktex	Tolerance %	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		80,0	72,0
26	512		90,0	81,0
28	594		106	95,4
30	682		118	106
32	776		132	119
36	982		170	153
40	1 210	±5	212	191
44	1 470		250	225
48	1 750		300	270
52	2 050		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

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