INTERNATIONAL STANDARD

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Polyamide fibre ropes — Double braid construction

Cordages en fibres de polyamide — Cordages coaxiaux

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ISO 10554:2009(E)

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Foreword

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ISO 10554 was prepared by Technical Committee ISO/TC 38, *Textiles*.

Polyamide fibre ropes — Double braid construction

1 Scope

This International Standard specifies requirements for double braided ropes and for higher-strength double braided ropes 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 9554:2005, *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 following:

— the words “fibre rope”;

— the number of this International Standard;

— the reference number of the rope;

— the material from which the rope is made;

— the level of performance of rope: double braided rope or higher-strength (hs) double braided rope.

EXAMPLE 1 Designation of a double braided rope, reference number 20, corresponding to a linear density of 249 ktex made of polyamide:

Fibre rope ISO 10554 - 20 - PA

EXAMPLE 2 Designation of a higher-strength (hs) double braided rope, reference number 20, corresponding to a linear density of 249 ktex made of polyamide:

Fibre rope ISO 10554 - 20 - PA (hs)

5 Material

The mixing of polyamide fibre types and grades shall not be permitted.

6 General requirements

6.1 Construction

Ropes produced according to this International Standard shall be constructed in the following way.

The rope (see Figure 1) shall be of a double braided construction wherein an inner braid of hollow structure manufactured in a separate operation shall serve as the core, while a cover (outer braid) is braided over it in a second operation. The weight of either the inner braid or the outer braid shall not exceed 55 % of the total weight of the rope. It shall also conform to ISO 9554.

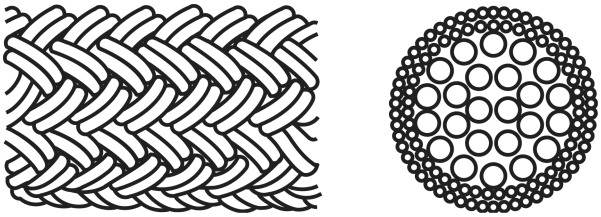

Figure 1 — Shape of a polyamide double braided rope and of a polyamide higher-strength double braided rope

6.2 Number of strands

For ropes of reference number from 6 to 16: the minimum number of strands of outer braid shall be 16.

For ropes of reference number greater than 16: the minimum number of strands of outer braid shall be 24.

6.3 Manufacture, labelling and packaging

Manufacture, labelling, packaging, invoicing and delivery lengths shall conform to ISO 9554.

6.4 Strand interchange

6.4.1 Strand interchange shall be the overlapping continuation of a single interrupted strand (or multiple strand) with another identical strand which follows the identical path in the braid. Although it is desirable that no strand interchange be present in the core or the cover of any size and length of rope, some methods of manufacture impose limitations. To compensate for these limitations, strand interchange shall be in accordance with 6.4.2 to 6.4.5.

6.4.2 To allow for a braider malfunction, one strand interchange shall be permitted in the core and one in the cover for a standard length of 200 m or less.

6.4.3 For lengths greater than 200 m, additional strand interchanges shall be permitted if deemed necessary by the manufacturer.

6.4.4 In producing the strand interchanges the distance of the overlapping shall be equivalent to 8 times the rope size number but not less than 600 mm for ropes whose reference numbers are 72 and less. Strand interchanges shall be at least 12 m apart measured from interchange centre to interchange centre.

6.4.5 Because strand interchanges within the core are difficult to detect after application of the cover, a record of verifiable information attesting to the number of strand interchanges shall be available to an inspector.

7 Physical properties

The linear density and minimum breaking force shall conform to Table 1.

Table 1 — Linear density and minimum breaking force of polyamide double braided rope and polyamide higher-strength double braided rope

Reference number[a]	Linear density[bc]		Minimum breaking force[de] kN			
	Nominal ktex	Tolerance %	Double braided rope		Higher-strength double braided rope	
			Unspliced ropes	Ropes with eye-spliced terminations	Unspliced ropes	Ropes with eye-spliced terminations
6	22,4	±10	6,58	5,92	7,89	7,10
8	39,8		11,7	10,5	14,0	12,6
10	62,2	±8	18,2	16,4	21,8	19,6
12	89,6		26,1	23,5	31,3	28,2
14	122		35,4	31,9	42,5	38,3
16	159	±5	46,1	41,5	55,3	49,8
18	202		58,3	52,5	69,9	62,9
20	249		71,8	64,6	86,2	77,6
22	301		86,7	78,0	104	94
24	358		103	93	124	112
26	420		121	109	145	131
28	488		140	126	168	151
30	560		161	145	193	174
32	637		183	165	219	197
36	806		231	208	277	249
40	995		284	256	341	307
44	1 200		343	309	412	371
48	1 430		408	367	490	441
52	1 680		478	430	574	517
56	1 950		554	499	665	598
60	2 240		635	572	762	686
64	2 550		723	651	867	780
72	3 220		917	825	1 100	990
80	3 980		1 130	1 017	1 350	1 220
88	4 820		1 360	1 224	1 630	1 470
96	5 730		1 620	1 458	1 940	1 750
104	6 730		1 890	1 701	2 270	2 040
112	7 800		2 190	1 971	2 630	2 370
120	8 960		2 520	2 268	3 020	2 720
128	10 200		2 860	2 574	3 430	3 090

Table 1 (*continued*)

Reference number[a]	Linear density[bc]		Minimum breaking force[de] kN			
	Nominal ktex	Tolerance %	Double braided rope		Higher-strength double braided rope	
			Unspliced ropes	Ropes with eye-spliced terminations	Unspliced ropes	Ropes with eye-spliced terminations
144	12 900	±5	3 620	3 258	4 340	3 910
168	17 600		4 890	4 401	5 870	5 280
192	22 900		6 390	5 751	7 670	6 900
216	29 000		8 040	5 236	9 650	8 700
240	35 800		9 920	8 928	11 900	10 700

[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 the rope, expressed in grams per metre or in kilograms per kilometre.

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

[d] The breaking forces relate to new, dry ropes. In wet conditions, these values may be lowered.

[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 terminations, the 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 may break at a significantly lower force. A knot or other distortion in a rope may significantly reduce the breaking force.

8 Marking

8.1 Polyamide double braided ropes

The marking of polyamide double braided ropes shall be carried out in accordance with Clause 6 of ISO 9554:2005.

8.2 Polyamide higher-strength double braided ropes

8.2.1 For higher-strength ropes with a reference number of less than 14, a central marker yarn in green shall be incorporated into the centre of the rope.

8.2.2 For higher-strength ropes with a reference number greater than or equal to 14, the quality identification on the marker tape shall indicate higher strength (hs).

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