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**Fibre ropes — High modulus  
polyethylene — 8-strand braided ropes,  
12-strand braided ropes and covered  
ropes**

*Cordages en fibres — Polyéthylène à haut module — Cordages  
8 torons, cordages 12 torons et cordages avec couverture*



Reference number  
ISO 10325:2009(E)

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## Foreword

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ISO 10325 was prepared by Technical Committee ISO/TC 38, *Textiles*.



# Fibre ropes — High modulus polyethylene — 8-strand braided ropes, 12-strand braided ropes and covered ropes

## 1 Scope

This International Standard specifies requirements for 8-strand braided ropes, for 12-strand braided ropes, and for covered rope constructions made of high modulus polyethylene (HMPE), 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 and the following apply.

### 3.1

**cover**

**jacket**

braided cover or other protective layer, which is placed over the rope core

NOTE The cover has no significant contribution to the rope strength.

## 4 Designation

Fibre ropes shall be designated by the following:

- the words “fibre rope”;
- the number of this International Standard;
- the construction type of the rope;
- the reference number of the rope;

— the material from which the rope is made.

EXAMPLE Designation of a 12-strand braided rope, reference number 20 (type T), corresponding to a linear density of 232 ktex made of high modulus polyethylene (HMPE):

**Fibre rope ISO 10325 – T – 20 – HMPE**

## 5 Material

5.1 The ropes shall be made of continuous HMPE fibres.

Different HMPE fibre grades may have different creep properties. If requested, the manufacturer shall provide information about creep properties.

5.2 Coating may be applied to the rope for property enhancement purposes.

5.3 Concerning covered ropes, the cover may consist of a variety of fibre materials, for example, polyester, polyolefins, HMPE.

5.4 The typical characteristics of high modulus polyethylene fibre are indicated in Table A.1 of ISO 9554:2005.

NOTE Ropes constructed from 100 % HMPE fibres float. However, covered HMPE ropes can have a higher linear density and might sink. HMPE fibres have a good resistance to axial compression resulting in a good intrinsic bending fatigue resistance. HMPE fibres have a low coefficient of friction and good abrasion resistance. The coefficient of friction can be altered by applying suitable coatings.

## 6 General requirements

### 6.1 General

HMPE fibre ropes shall be made in one of the following constructions:

- type L 8-strand braided ropes (see Figure 1)
- type T 12-strand braided ropes (see Figure 2)
- type C covered ropes [see Figures 3 a) and 3 b)]

### 6.2 Construction, manufacture and lay length

6.2.1 The construction, manufacture and lay length of 8-strand ropes and of 12-strand ropes shall conform to ISO 9554.

6.2.2 In the construction of covered ropes, the rope core is protected by a non-load-bearing cover. The construction, manufacture and lay length of the rope core or sub-ropes shall conform to ISO 9554.

NOTE The core or the sub-ropes can have various constructions.

6.2.3 In the protective cover, strand interchanges, i.e. the overlapping continuation of an interrupted strand with another identical strand following the same path, are permitted if they are properly staggered.

### 6.3 Labelling, packaging, invoicing and delivered lengths

Labelling, packaging, invoicing and delivered lengths shall conform to ISO 9554.

## 7 Physical properties

The linear density and minimum breaking force shall conform to Tables 1 and 2.

## 8 Marking

The manufacturer may use coloured synthetic yarn(s) to identify its rope.

The manufacturer may apply a coloured coating to identify its rope.

A printed marker tape shall be used in accordance with ISO 9554.

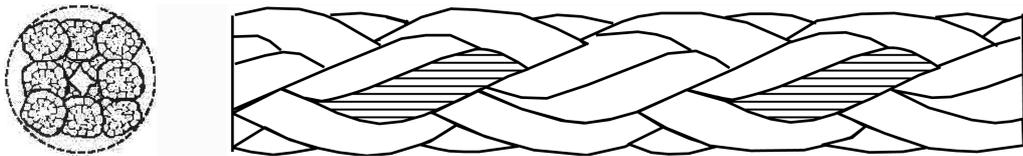


Figure 1 — Shape of an 8-strand braided rope (type L)

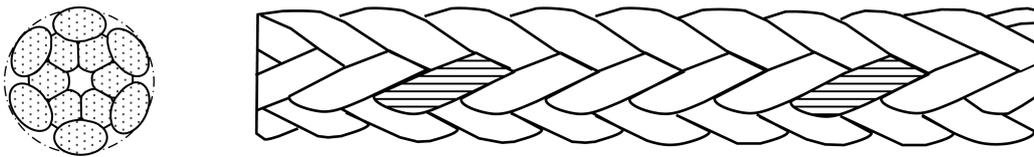
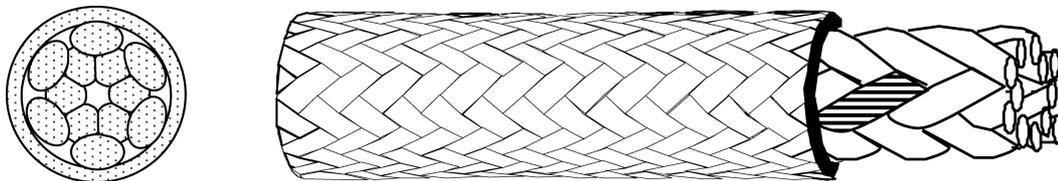
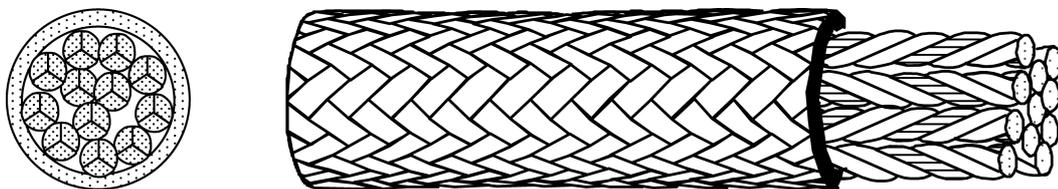


Figure 2 — Shape of a 12-strand braided rope (type T)



a) Single rope core



b) Multiple cores: 3-strand cores

Figure 3 — Shape of a covered rope (type C)

**Table 1 — Linear density and minimum breaking force of 8-strand (type L) and 12-strand (type T) HMPE braided ropes**

Reference number <sup>a</sup>	Linear density <sup>bc</sup>		Minimum breaking force <sup>de</sup>	
	Nominal ktex	Tolerance %	kN	
			Unspliced ropes	Ropes with eye-spliced terminations
6	23,0	±10	36,7	33,0
8	40,0		65,3	58,7
10	61,0	±8	102	92,0
12	87,0		147	132
14	117		200	180
16	151		260	235
18	190	±5	310	283
20	232		380	340
22	281		450	400
24	331		520	470
26	384		600	540
28	445		680	610
30	506		770	690
32	575		870	780
34	648		960	860
36	720		1 040	940
38	798		1 160	1 040
40	881		1 260	1 130
44	1 060		1 460	1 310
48	1 250		1 700	1 530
52	1 460		1 970	1 770
56	1 690		2 260	2 030
60	1 930	2 530	2 280	
64	2 200	2 840	2 560	
68	2 480	3 170	2 850	
72	2 780	3 520	3 170	
76	3 090	3 890	3 500	
80	3 430	4 300	3 870	
88	4 170	5 200	4 680	
96	4 970	6 180	5 560	

<sup>a</sup> The reference number corresponds to the approximate diameter, in millimetres.

<sup>b</sup> 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.

<sup>c</sup> The linear density is obtained under reference tension and is measured as specified in ISO 2307.

<sup>d</sup> The breaking forces relate to new, dry and wet ropes.

<sup>e</sup> 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 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 of covered HMPE ropes (type C)

Reference number <sup>a</sup>	Linear density <sup>bc</sup>		Minimum breaking force <sup>de</sup>	
	Nominal ktex	Tolerance %	kN	
			Unspliced ropes	Ropes with eye-spliced terminations
20	240		271	244
22	290		341	307
24	340		402	362
26	400		471	424
28	460		549	494
30	530		637	573
32	600		736	662
34	680		824	742
36	770		912	821
38	850		1 010	909
40	940		1 140	1 030
44	1 150	±10	1 380	1 240
48	1 360		1 610	1 450
52	1 600		1 920	1 730
56	1 850		2 190	1 970
60	2 120		2 520	2 270
64	2 400		2 880	2 590
68	2 720		3 260	2 930
72	3 070		3 630	3 270
76	3 400		4 020	3 620
80	3 750		4 510	4 060
88	4 500		5 350	4 820
96	5 300		6 280	5 650

<sup>a</sup> The reference number corresponds to the approximate diameter, in millimetres.

<sup>b</sup> 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.

<sup>c</sup> The linear density is obtained under reference tension and is measured as specified in ISO 2307.

<sup>d</sup> The breaking forces relate to new, dry and wet ropes.

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