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## Fibre ropes — General specifications

*Cordages en fibres — Spécifications générales*

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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.

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](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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

This fourth edition cancels and replaces the third edition (ISO 9554:2010), which has been technically revised. The main changes compared to the previous edition are as follows:

- methodology for rope design and strength realization factor has been introduced;
- strand interchanges have been introduced;
- [Table A.1](#) has been updated;
- [Annex C](#) has been updated.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Fibre ropes — General specifications

**IMPORTANT** — It is the responsibility of the user to select a rope that is fit for purpose, i.e. of the right size and with the physical properties that meet the requirements of the application and to determine the limitations prior to its use.

## 1 Scope

This document specifies the general characteristics of fibre ropes and their constituent materials. It is intended to be used in conjunction with the standards for the individual types of fibre rope, which cover the physical properties and specific requirements for that particular product type.

This document also gives some information on the use of fibre ropes and also on their inspection and retirement criteria.

This document does not intend to address all of the safety matters associated with its use.

## 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*

## 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

#### **strand interchange**

overlapping continuation, in a braided rope, of a single interrupted strand (or multiple strand) with another identical strand which follows an identical path in the braid

### 3.2

#### **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 [Annex D](#), two statistical methods are given that can be used to determine the MBS.

## 4 Manufacture

### 4.1 Constituent materials

The following materials are considered in this document:

a) natural fibres:

- sisal;
- manila;
- hemp;
- cotton.

b) man-made fibres:

- polyamide, PA;
- polyester, PES;
- polypropylene, PP;
- polyethylene, PE;
- mixed polyolefin, PP/PE;
- polyester/polyolefin dual fibres;
- high modulus polyethylene, HMPE;
- Para-Aramid, AR;
- Polyarylate, LCP;

— Polybenzobisoxazole, PBO.

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Typical characteristics for these materials are given in [Annex A](#). Specific applications should involve technical discussions with rope manufacturers.

### 4.2 Construction and structure

#### 4.2.1 Laid ropes

Unless otherwise specified, 3-, 4- and 6-strand laid ropes shall be Z-twist (right-hand lay), their strands S-twist and their roping yarns Z-twist.

#### 4.2.2 Braided ropes

The 8-strand braided ropes shall consist of four S-twist strands and four Z-twist strands arranged so that S-twist strands alternate (individually or in pairs) with Z-twist strands (individually or in pairs).

The 12-strand braided ropes shall consist of six S-twist strands and six Z-twist strands arranged so that S-twist strands alternate (individually or in pairs) with Z-twist strands (individually or in pairs).

#### 4.2.3 Double-braided ropes

A double-braided rope shall consist of a number of strands that are braided to form a core, around which additional strands are braided to form a sheath. The core lies coaxially within the sheath. The number of strands varies, based upon the size of the rope.