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Non-parallel steel wire and cords for tyre reinforcement

Fils d'acier et cordes non parallèles pour le renfort de pneumatiques

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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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 17, *Steel wire rod and wire products*.

This second edition cancels and replaces the first edition (ISO 17832:2009), which has been technically revised.

The following changes have been made:

— tensile strength for UT, ST and NT constructions has been updated;

— HI construction has been added;

— the tolerance for lay length has been narrowed from "±10 %" to "±5 %";

— the tolerance of residual torsion for HE construction has been narrowed from ±4 torsion/6 m to ±3 torsion/6 m;

— the tolerance for spool length has been narrowed;

— the weld breaking load for HT, ST and UT constructions has been increased.

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Non-parallel steel wire and cords for tyre reinforcement

1 Scope

This document specifies the definition and requirements of non-parallel steel wire and cords for tyre reinforcement.

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 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 3951-1, *Sampling procedures for inspection by variables — Part 1: Specification for single sampling plans indexed by acceptance quality limit (AQL) for lot-by-lot inspection for a single quality characteristic and a single AQL*

ISO 3951-2, *Sampling procedures for inspection by variables — Part 2: General specification for single sampling plans indexed by acceptance quality limit (AQL) for lot-by-lot inspection of independent quality characteristics*

ISO 3951-3, *Sampling procedures for inspection by variables — Part 3: Double sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 3951-5, *Sampling procedures for inspection by variables — Part 5: Sequential sampling plans indexed by acceptance quality limit (AQL) for inspection by variables (known standard deviation)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

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

3.1
filament
metal fibre with a metallic alloy coating used as an individual element in a *strand* (3.2) or *cord* (3.3)

3.2
strand
group of *filaments* (3.1) combined together to form a unit product for further processing

3.3
cord
formed structure composed of two or more *filaments* (3.1) when used as an end product, or a combination of *strands* (3.2) or filaments and strands

3.3.1
single-strand cord
cord (3.3) formed by twisting two or more *filaments* (3.1) together

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3.3.2
M+N type cord
cord (3.3) formed by twisting a number of non-concentric *filaments* (3.1) around a number of parallel filaments

Note 1 to entry: The cross-section is not round and varies along the length.

3.3.3
layer cord
cord (3.3) formed by adding layers around a core

Note 1 to entry: The layers can be filaments or strands.

3.3.4
multi-strand cord
cord (3.3) formed by twisting two or more *strands* (3.2) together

3.4
wrap
filament (3.1) wound helically around a steel *cord* (3.1)

3.5
direction of lay
helical disposition of the components of a *strand* (3.2) or cord

Note 1 to entry: The strand or cord has an "S" or left-hand lay, when held vertically, if the spirals around the central axis of the strand or cord conform in direction of slope to the central portion of the letter "S".

Note 2 to entry: The strand or cord has a "Z" or right-hand lay if the spirals conform in direction of slope to the central portion of slope of the letter "Z".

3.6
length of lay
axial distance required to make a 360° revolution of any element in a *strand* (3.2) or in a *cord* (3.3)

Note 1 to entry: The length of lay is expressed in millimetres.

4 Classification

4.1 Classification based on tensile strength

Steel cord is supplied in levels of tensile strength (see Figure 1), designated as follows:

— NT: normal standard (or regular) tensile strength cord;

— HT: high tensile strength cord;

— ST: super tensile strength cord;

— UT: ultra tensile strength cord.

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