

ICS 77.140.65

CCS H49



National Standard of the People's Republic of China

GB 8903-2024

Replaces GB 8903-2018

Steel wire ropes for lifts

Issued: June 25, 2024

Effective: September 25, 2024

State Administration for Market Regulation (SAMR)

Standardization Administration of the People's

Republic of China (SAC)

Issued

Translated by www.china-standards.com

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Foreword

This document is drafted in accordance with the provisions of GB/T 1.1-2020 Guidelines for Standardization - Part 1: Rules for the Structure and Drafting of Standardization Documents.

This document supersedes GB/T 8903-2018 Steel Wire Ropes for Elevators. Compared with GB/T 8903-2018, in addition to structural adjustments and editorial revisions, the main technical changes are as follows:

- Added requirements for steel wire strength grades (see Clause 6.1.1);
- Added new types of steel wire ropes including steel-based composite cores with polymer-coated steel cores (EPIWRC) and solid polymer cores (SPC) (see Clause 6.1.2);
- Revised the oil content range of natural fiber cores, and refined the oil content of synthetic fiber cores and strand ropes according to application purposes (see Clause 6.1.2, Clause 5.1.2 of the 2018 edition);
- Added diameter deviation categories for steel core wire ropes (see Clause 6.3.1);
- Revised technical requirements for wires from strands (see Clause 6.6, Clause 5.2.12 of the 2018 edition);
- Revised the elastic elongation index of steel wire ropes (see Clause 6.7, Clause 5.2.13 of the 2018 edition);
- Deleted the fatigue life test requirements (see Clause 5.2.14 of the 2018 edition);
- Added requirements for the measured weight per unit length of suspension steel wire ropes and compensation steel wire ropes (see Clause 6.8);
- Revised the sampling and acceptance rules (see Chapter 8, Chapter 8 of the 2018 edition);
- Revised the diameter range of suspension steel wire ropes (see Appendix A, Appendix A of the 2018 edition);
- Added reference weights of synthetic fiber core steel wire ropes (see Appendix A);
- Added new structures of steel wire ropes in 3 categories (see Tables A.9~A.11).

Please note that certain contents of this document may involve patents. The issuing authority of this document shall not be liable for identifying patents.

This document is proposed and administered by the Ministry of Industry and Information Technology of the People's Republic of China.

This document was first issued as GB 8903-1988 in 1988, revised for the first time as GB/T 8903-2005 in 2005, revised for the second time in 2018, and this is the third revision.

Steel wire ropes for lifts

1 Scope

This document specifies the classification and marking, ordering requirements, technical requirements, verification requirements and test methods, sampling and acceptance rules, as well as usage information and marking for carbon steel bright or coated steel wire ropes for elevators of different structures with a nominal diameter ranging from 6 mm to 38 mm.

This document is applicable to suspension steel wire ropes for traction-driven, hydraulic-driven and force-driven elevators. It is also applicable to compensation steel wire ropes and governor steel wire ropes for passenger elevators, goods elevators and service elevators operating between guide rails.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through normative reference in the text. For dated referenced documents, only the edition corresponding to that date applies to this document; for undated referenced documents, the latest edition (including all amendments) applies to this document.

GB/T 228.1 Metallic Materials—Tensile Testing—Part 1: Method of Test at Room Temperature

GB/T 238 Metallic Materials—Wire—Reverse Bending Test Method

GB/T 1839 Test Methods for Zinc Coatings on Steel Products

GB/T 2104 General Requirements for Packaging, Marking and Quality Certificate of Steel Wire Ropes

GB/T 8358 Steel Wire Ropes—Determination Method for Breaking Force

GB/T 8706 Steel Wire Ropes—Terms, Marking and Classification

GB/T 15030 Sisal Cores for Steel Wire Ropes

GB/T 21965 Steel Wire Ropes—Acceptance and Terminology for Defects

NB/SH/T 0387 Lubricants for Steel Wire Ropes

YB/T 081 Rules for Rounding Off of Numerical Values and Judgment of Test Numerical Values in Metallurgical Technical Standards

YB/T 4182 Determination Method for Oil Content of Steel Wire Ropes

YB/T 4452—2015 Fiber Cores for Steel Wire Ropes

YB/T 5198 Steel Wires for Elevator Steel Wire Ropes

YB/T 5343 Round Steel Wires for Wire Rope Manufacture

3 Terms and Definitions

The terms and definitions specified in GB/T 8706 as well as the following apply to this document.

3.1 single tensile rope

A steel wire rope in which the outer wires and inner wires of the outer strands have the same tensile strength grade (except for the core wires and filler wires).

3.2 dual tensile rope

A steel wire rope in which the outer wires and inner wires of the outer strands have different tensile strength grades (except for the core wires and filler wires).

Example: Grade 1370/1770, where the tensile strength grade of the outer wires of the outer strands is 1370, and that of the inner wires is 1770.

3.3 steel based composite core; SCC

A rope core composed of steel wires compounded with fibers or polymers.

3.4 composite steel core; CSC

A type of steel based composite core, which is twisted by mixing steel wire strands with fiber cores or polymer cores.

4 Classification and Marking

The classification and marking of steel wire ropes shall comply with the requirements of GB/T 8706.

5 Ordering Requirements

Contracts for ordering products in accordance with this document shall include the following contents:

- a) Quantity, in meters (m);
- b) Nominal diameter, in millimeters (mm);
- c) Deviation requirement category (applicable only to steel core wire ropes);
- d) Type or structure of steel wire ropes;
- e) Surface condition;
- f) Strength grade or minimum breaking force;
- g) Lay type;
- h) Core type, oil content category of fiber cores;
- i) Application:
 - Suspension steel wire ropes,

Governor steel wire ropes,

Compensation steel wire ropes;

j) Others (if any).

6 Technical Requirements

6.1 Materials

6.1.1 Steel Wires

6.1.1.1 Properties and Strength Grades of Steel Wires

The selection of properties and strength grades of steel wires for wire rope manufacturing shall comply with the requirements specified in Table 1.

6.1.1.2 Surface Condition

Unless otherwise specified by the purchaser, steel wire ropes shall be made of bright steel wires.

If the purchaser requires coatings, such requirements shall be specified in the contract or purchase order. The coating quality of coated steel wires shall comply with the requirements of YB/T 5198 or the provisions of Grade B in YB/T 5343.