



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 4357-2022

Cold-drawn unalloyed steel wire for springs

Issued on: April 15, 2022

Implemented on: November 1, 2022

Issued by: SAMR; SAC

Table of Contents

Foreword...	4
1 Scope...	6
2 Normative references...	6
3 Terms and definitions...	7
4 Classification and marking...	9
4.1 Classification...	9
4.2 Marking...	9
5 Order contents...	10
6 Dimensions and shape requirements...	10
6.1 Dimensions and allowable deviation...	10
6.2 Out-of-roundness...	12
6.3 Cast of steel wire...	13
6.4 Straightness of straight wire...	13
7 Technical requirements...	14
7.1 Materials...	14
7.2 Surface state and requirements...	14
7.3 Surface quality...	16
7.4 Mechanical properties...	16
7.5 Process performance...	16
7.6 Welding...	17
8 Test methods...	22
8.1 Dimensions and appearance...	22
8.2 Plating...	22
8.3 Surface quality...	23
8.4 Mechanical properties...	23
8.5 Process performance...	23
8.6 Other test methods...	23
9 Inspection rules...	24
9.1 Inspection and acceptance...	24
9.2 Group-batching rules...	24
9.3 Spot check and sampling...	24
9.4 Re-inspection...	24

9.5 Numerical rounding and determination...	24
10 Packaging, transportation, storage, marking, quality certificate...	26
10.1 Packaging, transportation, storage...	26
10.2 Markings and quality certificates...	26

Foreword

This document was drafted, in accordance with the provisions of GB/T 1.1-2020

"Directives for standardization - Part 1. Rules for the structure and drafting of standardizing documents".

This document replaces GB/T 4357-2009 "Cold-drawn non-alloy steel wire for springs".

Compared with GB/T 4357-2009, except for structural adjustment and editorial changes, the main technical changes are as follows.

- a) ADD the normative references (see Chapter 2; Chapter 2 of the 2009 edition);
- b) ADD the term "patented" and its definition. DELETE the terms "cold-drawn non-alloy steel wire for spring" and "ring" and their definition; CHANGE the definition of other terms (see Chapter 3; Chapter 3 of 2009 edition);
- c) CHANGE the Table 1 and order content (see Table 1; Chapters 4 and 5 of the 2009 edition);
- d) CHANGE the technical requirements for wire rods (see 7.1.1; 7.1.2 and Table 5 of the 2009 edition);
- e) ADD the area reduction index (see Table 6); CHANGE some torsional performance indexes (see Table 6; Table 8 of 2009 edition), as well as some strength indexes in the range of 0.40 mm ~ 0.48 mm (see Table 6; Table 8 of the

2009 edition);

- f) CHANGE the allowable fluctuation range of the tensile strength of the same coil of steel wire (see Table 7; 7.4.2 of the 2009 edition);
- g) ADD the inspection method for the pitch (see 8.1.4);
- h) ADD the inspection method for aluminum content, in zinc-aluminum alloy plating

(see 8.2.1);

i) CHANGE the "nominal diameter" on which the tensile strength is based, into "measured diameter" (see 8.4; 7.4.1 of the 2009 edition);

j) CHANGE the "Summary of inspection items, applicability, requirements, sampling inspection proportion, test methods, technical requirements" (see Table 8; Table 9 of the 2009 edition);

k) ADD the transport and storage requirements (see 10.1; 10.1 of the 2009 edition);

l) ADD the Appendix C, to provide guidance and suggestions for the selection of steel wires.

This document modifies and adopts ISO 8458-2:2002 "Steel wire for mechanical springs - Part 2. Patented cold-drawn non-alloy steel wire".

Compared with ISO 8458-2:2002, this document has many adjustments in structure. See Appendix A, for a comparison of structure numbering changes between the two documents.

Compared with ISO 8458-2:2002, this document has many technical differences, which are marked by a vertical single line (|) in the outer margin of the clauses involved. See Appendix B, for these technical differences and their reasons.

Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents.

This document was proposed by China Iron and Steel Association.

This document shall be under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC 183).

This document was first published in 1984; revised for the first time in 1989; revised for the second time in 2009. This is the third revision.

1 Scope

This document specifies the classification and marking, order content, size and shape requirements, technical requirements, test methods, inspection rules, packaging, transportation, storage, marking, quality certificates for the manufacture of cold-drawn

non-alloy steel wire for springs.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 222 Permissible tolerances for chemical composition of steel products

GB/T 224 Determination of the depth of decarburization of steels (GB/T 224-2019, ISO 3887.2017, MOD)

GB/T 228.1 Metallic materials - Tensile testing - Part 1. Method of test at room temperature (GB/T 228.1-2010, ISO 6892-1.2009, MOD)

GB/T 239.1 Metallic materials - Wire - Part 1. Simple torsion test (GB/T 239.1-2012, ISO 7800.2003, MOD)

GB/T 341 Steel wire - Classification and terminology

GB/T 342-2017 Dimension, shape, mass and tolerance of cold-drawn round square and hexagonal steel wires (ISO 22034-2.2016, NEQ)

GB/T 1839 Test method for gravimetric determination of the mass per unit area of galvanized coatings on steel products (GB/T 1839-2008, ISO 1460.1992, MOD)

3 Terms and definitions

The terms and definitions, which are defined in GB/T 341, as well as the following terms and definitions, apply to this document.

3.1

Patented

A heat treatment method, which places the medium carbon steel or high carbon steel, that was heated for austenitizing, in a hot bath of appropriate temperature (such as lead bath, salt bath, water bath, etc.) OR in a forced air flow (such as controlled air cooling after rolling in a steel mill), for cooling purposes, to obtain sorbite or sorbite-based metallography.