

Steel wire for mechanical springs - Part 1: Patented
cold drawn unalloyed spring steel wire

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 10270-1:2024 sisaldab Euroopa standardi EN 10270-1:2024 ingliskeelset teksti. Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas. Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 28.02.2024. Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	This Estonian standard EVS-EN 10270-1:2024 consists of the English text of the European standard EN 10270-1:2024. This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation. Date of Availability of the European standard is 28.02.2024. The standard is available from the Estonian Centre for Standardisation and Accreditation.
---	---

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 77.140.25

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardimis- ja Akrediteerimiskeskusele. Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardimis-ja Akrediteerimiskeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardimis-ja Akrediteerimiskeskusega: Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation and Accreditation. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation and Accreditation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation and Accreditation: Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

Steel wire for mechanical springs - Part 1: Patented cold drawn unalloyed spring steel wire

Fils en acier pour ressorts mécaniques - Partie 1 : Fils
pour ressorts en acier non allié, patentés, tréfilés à
froid

Stahldraht für Federn - Teil 1: Patentiert gezogener
unlegierter Federstahldraht

This European Standard was approved by CEN on 4 September 2023.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	5
4 Classification.....	6
5 Information to be supplied by the purchaser.....	6
6 Requirements.....	7
6.1 Material	7
6.1.1 General.....	7
6.1.2 Chemical composition	7
6.2 Form of delivery	7
6.3 Coating and surface finish.....	7
6.4 Mechanical properties	7
6.5 Technological properties.....	15
6.5.1 Coiling test.....	15
6.5.2 Simple torsion test.....	15
6.5.3 Wrapping test.....	15
6.5.4 Simple bend test.....	15
6.6 Supply conditions of wire on coils/reels and spools	16
6.6.1 General.....	16
6.6.2 Coil size	16
6.6.3 Cast of wire	16
6.6.4 Helix cast of wire	16
6.6.5 Other tests for cast of wire	17
6.7 Surface quality	17
6.8 Dimensions and dimensional tolerances	18
6.8.1 Dimensional tolerances.....	18
6.8.2 Out of roundness	20
7 Testing and inspection.....	20
7.1 Inspection and inspection documents	20
7.2 Extent of testing for specific inspection.....	20
7.3 Sampling.....	20
7.4 Test methods	21
7.4.1 Chemical composition	21
7.4.2 Tensile test	21
7.4.3 Coiling test.....	21
7.4.4 Wrapping test.....	21
7.4.5 Simple torsion test.....	21
7.4.6 Simple bend test.....	21
7.4.7 Surface defects	21
7.4.8 Decarburization	22
7.4.9 Diameter	22
7.4.10 Zinc and zinc/aluminium coating	22
7.4.11 Adherence of coating	22

7.5	Retests	22
8	Marking and packaging	22
	Annex A (informative) Additional information	26
A.1	Definition of surface condition of the wire.....	26
A.2	Physical characteristics at room temperature	27
A.3	Accuracy of measuring instruments.....	27
A.4	Tensile strength formula	27
A.5	Indication for the use of cold drawn spring steel wire	28
	Annex B (informative) Protection performance classes	29
	Bibliography	30

European foreword

This document (EN 10270-1:2024) has been prepared by Technical Committee CEN/TC 459 “ECISS – European Committee for Iron and Steel Standardization”¹, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2024 and conflicting national standards shall be withdrawn at the latest by August 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document will supersede EN 10270-1:2017.

In comparison with the previous edition, the following technical modifications have been made:

- 3.1, added specific requirements for Dynamic duty (D);
- 6.7.3, added “Protection Performance class”.

EN 10270, *Steel wire for mechanical springs* is composed of the following parts:

- *Part 1: Patented cold drawn unalloyed spring steel wire;*
- *Part 2: Oil hardened and tempered spring steel wire.*

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

¹ Through its sub-committee SC 6 “Wire rod and wires” (secretariat: AFNOR).

1 Scope

This document applies to patented cold drawn unalloyed steel wire of circular cross-section for the manufacture of mechanical springs for static duty and dynamic duty applications.

General technical delivery requirements can be found in EN 10021.

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.

EN 10021, *General technical delivery conditions for steel products*

EN 10204, *Metallic products - Types of inspection documents*

EN 10218-1, *Steel wire and wire products - General - Part 1: Test methods*

EN 10218-2, *Steel wire and wire products - General - Part 2: Wire dimensions and tolerances*

EN 10244-2, *Steel wire and wire products - Non-ferrous metallic coatings on steel wire - Part 2: Zinc or zinc alloy coatings*

CEN/TR 10261, *Iron and steel - European standards for the determination of chemical composition*

EN ISO 377, *Steel and steel products - Location and preparation of samples and test pieces for mechanical testing (ISO 377)*

EN ISO 3887, *Steels - Determination of the depth of decarburization (ISO 3887)*

EN ISO 6892-1, *Metallic materials - Tensile testing - Part 1: Method of test at room temperature (ISO 6892-1)*

EN ISO 14284, *Steel and iron - Sampling and preparation of samples for the determination of chemical composition (ISO 14284)*

EN ISO 16120-1, *Non-alloy steel wire rod for conversion to wire - Part 1: General requirements (ISO 16120-1)*

EN ISO 16120-2, *Non-alloy steel wire rod for conversion to wire - Part 2: Specific requirements for general purpose wire rod (ISO 16120-2)*

EN ISO 16120-4, *Non-alloy steel wire rod for conversion to wire - Part 4: Specific requirements for wire rod for special applications (ISO 16120-4)*

3 Terms and definitions

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

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

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp/>