

Steel wire for mechanical springs —

Part 3: Stainless spring steel wire

The European Standard EN 10270-3:2001 has the status of a British Standard

ICS 77.140.25

National foreword

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The UK participation in its preparation was entrusted to Technical Committee ISE/26, Steel wire, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

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Foreword

This European Standard has been prepared by Technical Committee ECISS/TC 30, Steel wires, the Secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by October 2001, and conflicting national standards shall be withdrawn at the latest by October 2001.

This European Standard for 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

Part 3: Stainless spring steel wire

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

1.1 This Part of EN 10270 applies to the grades of stainless steels listed in Table 1, which are usually used in the cold drawn condition in the form of wire of circular cross-section up to 10,00 mm in diameter, for the production of springs and spring parts that are exposed to corrosive effects and sometimes to slightly increased temperatures (see A.1).

1.2 In addition to the steels listed in Table 1 certain of the steel grades covered by EN 10088-3, e.g. 1.4571, 1.4539, 1.4028, are also used for springs, although to much lesser extent. In these cases the mechanical properties (tensile strength, etc.) should be agreed between purchaser and supplier. Similarly, diameters between 10,00 mm and 15,00 mm may be ordered against this standard; in this case the parties should agree upon the required mechanical characteristics.

1.3 In addition to this part of EN 10270 the general technical delivery requirements of EN 10021 are applicable.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 10002-1, *Metallic materials — Tensile test — Part 1: Method of test (at ambient temperature)*

EN 10021, *General technical delivery requirements for steel and iron products*

EN 10027-1, *Designation systems for steel — Part 1: Steel names, principal symbols*

EN 10027-2, *Designation systems for steel — Part 2: Steel numbers*

EN 10088-3, *Stainless steels — Part 3: Technical delivery conditions for semi-finished products, bars, rods and sections for general purposes.*

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: Dimensions and tolerances*

CR 10261, *Iron and steel — Review of available methods of chemical analysis*

EN ISO 377, *Steel and steel products — Location and preparation of samples and test pieces for Mechanical testing*

ISO 14284, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition*

3 Designation

For products supplied according to this standard the designation shall state in the following order:

- the term spring wire or straightened and cut lengths;
- the number of this European standard: EN 10270-3;
- the steel grade, and where applicable the tensile strength level;
- the nominal wire diameter;
- the coating, if any.

EXAMPLE: Standard designation of a stainless steel spring wire according to this standard - grade 1.4310 - normal strength level and nominal diameter 2,50 mm, nickel coated:

Spring wire EN 10270-3 - 1.4310 - NS - 2,50 Ni coated

4 Information to be supplied by the purchaser

The purchaser shall clearly state in his enquiry or order the product and following information:

- a) the desired quantity;
- b) the number of this European Standard: EN 10270-3;
- c) the steel grade and, for grade 1.4310, also the tensile strength level;
- d) the nominal wire diameter;
- e) the surface finish (see 5.3) ;
- f) the form of delivery (see 5.2);
- g) the type of inspection document (see 7.1) to be supplied;
- h) any particular agreement made.

EXAMPLE: 2 t stainless spring steel wire EN 10270-3 - 1.4310 - NS - 2,50 nickel coated in coils inspection document EN 10204 - 3.1.B

5 Requirements

5.1 Manufacturing process

Unless otherwise agreed in the order, the manufacturing process used in the making of the stainless steel wire is left to the discretion of the manufacturer. The starting condition (+AT: solution annealed) of the wire (rod) is specified in EN 10088-3.

5.2 Form of delivery

The wire shall be supplied in coils, on spools, on spoolless cores or carriers. Several coils may be assembled on a carrier. Unless otherwise specified the form of delivery shall be at the manufacturer's discretion. He shall however inform the purchaser about the form of delivery.

The delivery requirements are specified in 5.7.

Wire in straight lengths is normally supplied in bundles.

5.3 Surface finish

The wire may be coated or not. The specific coating and finish for stainless steel spring wire shall be agreed upon at the time of enquiry and order, e.g. uncoated, polished finish, nickel coated.

5.4 Chemical composition

5.4.1 The requirements for the chemical composition given in Table 1 apply to the heat analysis.

5.4.2 The permissible deviation of the product analysis from the values specified in Table 1 shall be in accordance with the provision in EN 10088-3. For a single heat the deviation of an element in the product analysis may be only below the minimum or only above the maximum value of the range specified for the heat analysis, but not both at the same time.

Table 1 — Chemical composition — Heat analysis (% by mass) ^a

Steel grade		C	Si max.	Mn max.	P max.	S max.	Cr	Mo	Ni	Others
Name ^b	Number ^b									
X10CrNi18-8	1.4310	0,05 to 0,15	2,00	2,00	0,045	0,015	16,00 to 19,00	≤ 0,80	6,00 to 9,50	N:≤ 0,11
X5CrNiMo17-12-2	1.4401 ^c	≤ 0,07	1,00	2,00	0,045	0,015	16,50 to 18,50	2,00 to 2,50 ^c	10,00 to 13,00	N:≤ 0,11
X7CrNiAl17-7	1.4568	≤ 0,09	0,70	1,00	0,040	0,015	16,00 to 18,00		6,50 to 7,80 ^d	Al: 0,70 to 1,50

^a Alternative compositions may be used by agreement.

^b Names and numbers are derived in accordance with EN 10027 — Part 1 and Part 2 respectively.

^c Steel 1.4436 may be used to provide increased corrosion resistance compared with 1.4401, with the specification of this part of EN 10270 applicable for steel 1.4401.

^d For better cold formability the upper limit may be increased to 8,30 %.