INTERNATIONAL STANDARD

ISO 7900

Second edition
2006-06-01

Steel wire and wire products for fences — Zinc- and zinc-alloy-coated steel barbed wire

Fils et produits tréfilés en acier pour clôtures — Ronces en acier revêtu de zinc ou d'alliages de zinc

Reference number
ISO 7900:2006(E)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 7900 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 7900:1988), which has been technically revised.

Steel wire and wire products for fences — Zinc- and zinc-alloy-coated steel barbed wire

1 Scope

This International Standard specifies the characteristics of zinc- and zinc-alloy-coated steel barbed wire, with conventional and reverse twist consisting of two stranded line wires, around which the barbs are tightly wound, a twist being imparted between the barbs to restrict their movement. The barbed-wire entanglement has a single line wire, around which the barbs are wound.

2 Normative references

The following referenced documents are indispensable for the application 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 404, *Steel and steel products — General technical delivery requirements*

ISO 6892, *Metallic materials — Tensile testing at ambient temperature*

ISO 7989-1, *Steel wire and wire products — Non-ferrous metallic coatings on steel wire — Part 1: General principles*

ISO 7989-2, *Steel wire and wire products — Non-ferrous metallic coatings on steel wire — Part 2: Zinc or zinc-alloy coating*

ISO 8458-1, *Steel wire for mechanical springs — Part 1: General requirements*

ISO 10474, *Steel and steel products — Inspection documents*

3 Information to be supplied by the purchaser

The following information shall be supplied by the purchaser at the time of inquiry or order:

a) the number of this International Standard;

b) quantity;

c) type of barbed wire;

d) coating type;

e) barb spacing;

f) length on reels;

g) in the case of barbed-wire entanglement (BWE), the type of finish;

h) whether the uniformity of coating is to be measured;

i) inspection documentation requirements;

j) agreed quality characteristics for testing (see Clause 6).

4 Manufacture

4.1 Base metal

The base metal of the barbed wire shall be of a good-commercial-quality steel wire, having the properties specified in Table 1.

Table 1 — Nominal diameters, minimum tensile strengths and minimum breaking loads for barbed wire

Wire type	Type of barbed wire	Nominal wire diameter mm	Tolerances on diameters mm	Minimum tensile strength of wire N/mm^{2}[a]	Minimum strand breaking load[b] N
Line	Conventional	2,5	± 0,060	350	3 434
	Reverse twist	1,70	± 0,050	950	4 230
	BWE	3,00	± 0,070	1 250	8 836
Point	Conventional and BWE	2,00	± 0,050	350	—
	Reverse twist	1,50	± 0,045	350	—

[a] 1 N/mm^{2} = 1 MPa

[b] The minimum strand breaking load shall be the overriding criterion.

4.2 Fabrication

4.2.1 General

The wire shall be zinc coated or zinc-alloy coated in accordance with ISO 7989-2, before fabrication into barbed wire, except for barbed-wire entanglement, which may be made from bright wire and suitably finished (other than zinc coated) in its final state.

4.2.2 Conventional barbed wire (C)

The conventional barbed wire shall be formed from two line wires complying with 4.1 and Table 1, twisted together with an approximate lay of 50 mm. Typical barb spacing is 75 mm ± 10 mm, or 100 mm ± 10 mm (or other spacing by agreement). Barb spacing shall be measured in accordance with 8.4.

The barbs shall be tightly wrapped round the two stranded line wires by a method that prevents slipping, to expose the four barbs at an angle of approximately 90° apart, in a plane at right angles to the axis of the line wire (e.g. see Figure A.1). The barbs shall project a distance of 12,5 mm ± 3,5 mm from the centerline of the wire, and the barb ends shall be cut at an angle not greater than 35° to the axis of the barb.

4.2.3 Reverse-twist type (RT)

The barbed wire shall be formed from two line wires complying with 4.1 and Table 1, twisted together with an approximate lay of 25 mm. Typical barb spacing is 75 mm ± 10 mm, or 100 mm ± 10 mm (or other spacing by agreement). Barb spacing shall be measured in accordance with 8.4.

The barbs shall be formed by tightly wrapping round the two stranded line wires, to expose the four barbs in a fixed position at an angle of approximately 90° apart, in a plane at right angles to the axis of the line wires. The barbs shall project a distance of 12,5 mm ± 3,5 mm from the centerline of the wire, and the barb ends shall be cut at an angle not greater than 35° to the axis of the barb.

The barbed wire shall not start to unwind until 75 % of the total nominal breaking load is applied. The unwinding of the barbed wire occurs when the stranded wires no longer extend under the influence of the applied load. The wires start to unravel in such a way that the number of twists of the wire around each other diminishes. This is

noticeable in the stress/strain curve of the tensile test, where the first major drop in stress occurs. The tensile test shall be performed on a sample of two barb spacings.

4.2.4 Barbed-wire entanglement (BWE)

4.2.4.1 The entanglement shall be formed from wire complying with 4.1 and Table 1. The single-line wire shall be crimped to an approximate pitch of 16 mm and approximate amplitude of 1 mm, excluding the wire diameter.

4.2.4.2 The barbed wire shall be formed from one crimped line wire, with four-point barbs spaced at intervals between centers of 60 mm $\pm$ 15 mm. The barbs shall be formed by wrapping round the line wire approximately four turns, to expose the barbs in a fixed position at an angle of approximately 90° apart, in a plane at right angles to the axis of the line. The barbs shall project a distance of 15 mm to 20 mm from the centerline of the wire, and the barb ends shall be cut at an angle not greater than 35° to the axis of the barb.

4.2.4.3 The barbed-wire entanglement shall be supplied as a uniform cylindrical coil complying with a) or b) as follows:

a) 68 turns approximately 1 m in diameter, with adjacent turns clipped together in a lozenge pattern, the coil being capable of being extended to a length of 15 m.

b) 32 turns 0,50 m $\pm$ 0,1 m in diameter, clipped together in a lozenge pattern, the coil being capable of being extended to a length of 6 m.

Along the length of the coil, adjacent turns in the coil shall be fastened together with five rows of clips made from austenitic stainless steel in the softened condition, or galvanized steel. The rows of clips shall be spaced around the circumference of the coils at 72° $\pm$ 10° intervals. The start and end of the coil shall also be fitted with two additional clips 50 mm apart to secure the ends of the coil.

The clips shall be completely closed round the two wires, but allowing sufficient movement to permit the formation of the concertina when the coil is extended, without the line wire being permanently deformed at the clips.

If the entanglement is manufactured from bright wire, a finish should be applied, such as bitumastic (by spraying or by dipping), to provide durability during bad weather.

4.3 Welding

Joining of individual wires by means of an electric butt weld is permitted, provided such joints are 10 m apart and are made in a workmanlike manner. The weld area shall be suitably protected against corrosion.

5 Requirements

Before transformation into barbed wire, the zinc- or zinc-alloy-coated wire shall be tested in accordance with ISO 7989-2, class A for coating mass, adherence and, where specified, the uniformity of the coating.

Where samples are taken from the fabricated barbed wire then the specified minimum coating mass shall be reduced by 5 % and, if specified, the minimum number of dips by 0,5 min.

The nominal diameters, tolerances on diameters, minimum tensile strengths and minimum breaking loads of barbed wire shall be as in Table 1.

6 Sampling and testing

The manufacturer shall be responsible for the control of product quality by the application of statistical methods of sampling and analysis of results or, alternatively, by sampling and testing for the agreed quality characteristics at a rate of one reel in fifty.

7 Inspection and documentation

Non-specific testing and inspection documentation shall be provided in accordance with ISO 404 and ISO 10474.

8 Methods of test

8.1 Tensile tests

Tensile tests shall be carried out in accordance with ISO 6892.

8.2 Dimensions

Dimensions shall be measured in accordance with ISO 8458-1.

8.3 Zinc and zinc-alloy coatings

Zinc and zinc-alloy coatings shall be assessed in accordance with ISO 7989-1 and ISO 7989-2.

8.4 Barb spacing

Barb spacing shall be measured and averaged over a sample of length at least 10 m.

9 Packaging

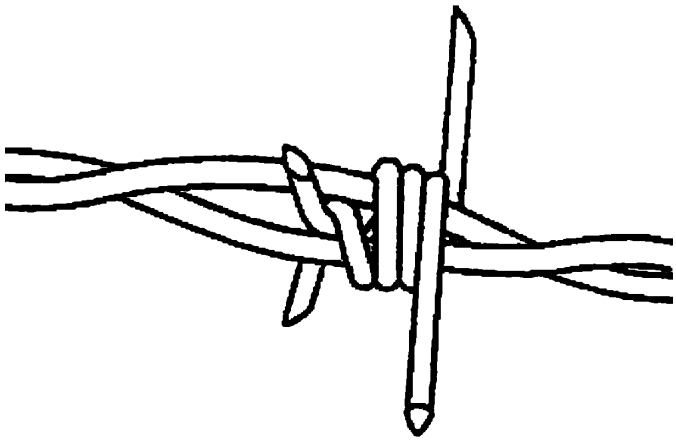
Conventional and reverse-twist barbed wire shall be supplied on reels in typical minimum lengths of 100 m, 200 m, 250 m or 500 m.

NOTE Other lengths may be supplied by agreement.

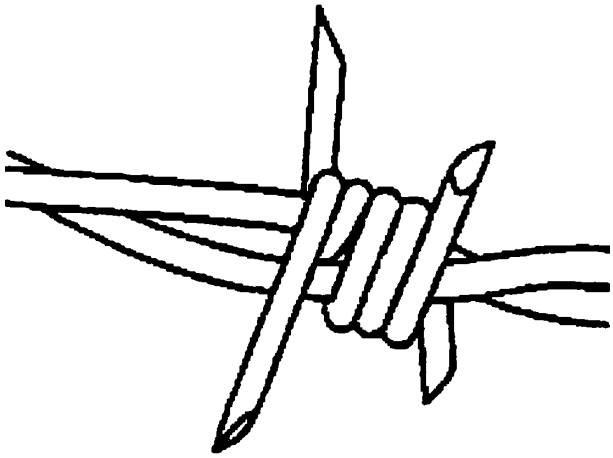
BWE shall be supplied in coil in bundles of fifteen.

Annex A
(informative)

Typical barbed-wire formation (other types of barbed wire may be available)



a)



b)

Figure A.1 — Conventional barbed wire

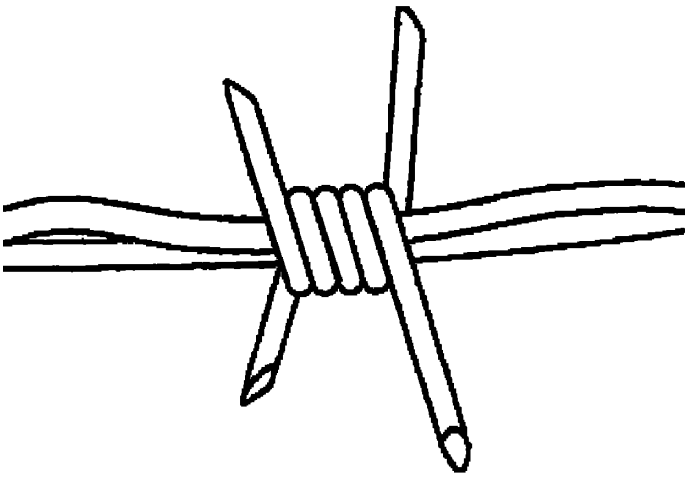


Figure A.2 — Reverse-twist type

ICS 77.140.65; 91.090

Price based on 6 pages