

IS 278 : 2009

(Reaffirmed 2015)

(Reaffirmed 2020)

भारतीय मानक

फेंसिंग के लिए जस्तीकृत इस्पात की काँटेदार
तार — विशिष्टि
(चौथा पुनरीक्षण)

Indian Standard

**GALVANIZED STEEL BARBED WIRE FOR
FENCING — SPECIFICATION**

(Fourth Revision)

ICS 77.140.65; 91.090

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

Wire Ropes and Wire Products Sectional Committee, MED 10

FOREWORD

This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Wire Ropes and Wire Products Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in 1951, and subsequently revised in 1962 and 1978. The present revision has been taken up with a view to modify the earlier provisions in the light of experience gained in implementation of this standard by both manufacturers and the users. In this revision, all the four amendments issued to its third revision have been incorporated.

The following are the main changes in this revision:

- a) Requirement of galvanizing has been changed to minimum medium or heavy coating in place of minimum medium coating.
- b) Use of electrogalvanized wire has been included for fabrication of barbed wire.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed and calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

GALVANIZED STEEL BARBED WIRE FOR FENCING — SPECIFICATION

(*Fourth Revision*)

1 SCOPE

This standard covers the requirements for two types of galvanized steel barbed wire with two strands of wire, in a number of sizes and constructions.

2 REFERENCES

The following standards contain provisions, which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	Title
280 : 2006	Mild steel wire for general engineering purposes (<i>fourth revision</i>)
1340 : 1977	Code of practice for chromate conversion coating of zinc and cadmium coated articles and zinc base alloys (<i>first revision</i>)
1608 : 1995	Mechanical testing of metals — Tensile testing (<i>third revision</i>)
1755 : 1983	Method for wrapping test for metallic wire (<i>first revision</i>)
2633 : 1986	Methods for testing uniformity of coating of zinc coated articles (<i>second revision</i>)
4826 : 1979	Specification for hot-dipped galvanized coatings on round steel wires (<i>first revision</i>)
12753 : 1989	Electrogalvanized coatings on round steel wire — Specification

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Length of the Barb, shall mean the distance of the barb point from the axis of the line wire of wires around which the point wire is wound.

3.2 Line Wire, shall mean a wire of specified diameter of which the barbed wire is made.

3.3 Point Wire, shall mean a wire of specified diameter of which the barbs are made.

4 TYPES

4.1 Type A (Iowa Type)

The barbs shall have four points and shall be formed by twisting two-point wires, each two turns, tightly around both line wires making altogether four complete turns (*see* Fig. 1).

4.2 Type B (Glidden Type)

The barbs shall have four points and shall be formed by twisting two-point wires, each two turns, tightly around one line wire making altogether four complete turns (*see* Fig. 1).

5 SIZES

The sizes of barbed wire shall be as given in Table 1.

6 MATERIAL

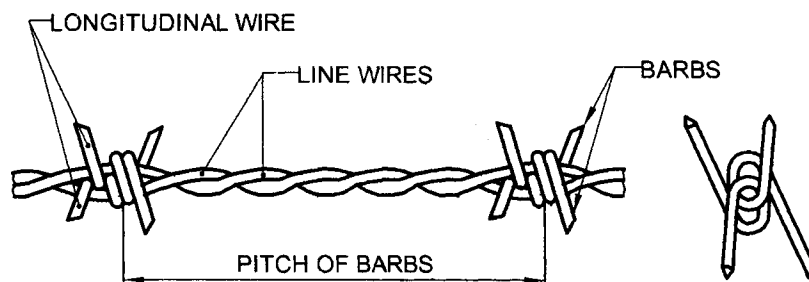
The galvanized barbed wire shall be manufactured from mild steel wire conforming to IS 280. The galvanized coating shall conform to the requirements for any one of the type of coating as given in IS 4826 as per agreement with the purchaser. The coating requirements of electrogalvanized wire shall conform to the requirements for any one of the type as given in IS 12753 as per agreement with the purchaser.

7 MANUFACTURE

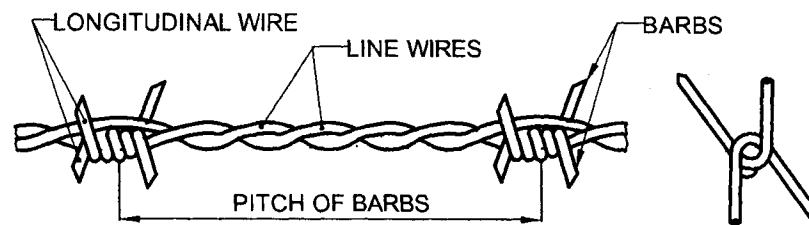
7.1 The barbed wire shall be formed by twisting together two-line wires, one or both containing the barbs. The direction of twisting may be in one direction or alternately in left or right directions.

7.2 The barbs shall be so finished that the four points are set and located or locked as far as possible at right angles to each other (*see* Fig. 1). The barbs shall be well formed, tightly wrapped and shall have a length of not less than 13 mm and not more than 18 mm. The

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TYPE A



TYPE B

FIG. 1 TYPE A (IOWA TYPE) AND TYPE B (GLIDDEN TYPE)

Table 1 Sizes
(Clause 5)

Sl No.	Size Designation	Diameter of Wire				Mass of Completed Barbed Wire		Distance Between Two Barbs mm	No. of Lays Between the Two Consecutive Barbs
		Line Wire		Point Wire					
		Nominal mm	Tolerance mm	Nominal mm	Tolerance mm	Max g/m	Min g/m		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	1	2.50	±0.08	2.50	±0.08	155	136	75 ± 12	2 to 7
ii)	2	2.50	±0.08	2.50	±0.08	120	108	150 ± 12	2 to 7
iii)	3	2.50	±0.08	2.00	±0.08	125	108	75 ± 12	2 to 7
iv)	4	2.50	±0.08	2.00	±0.08	103	89	150 ± 12	2 to 7
v)	5	2.24	±0.08	2.00	±0.08	106	97	75 ± 12	2 to 7
vi)	6	2.24	±0.08	2.00	±0.08	85	78	150 ± 12	2 to 7

NOTE — The mass in g/m shall be obtained by dividing the total mass of the reel by the linear length in meters.

point shall be sharp and cut at an angle not greater than 35° to the axis of the wire forming the barbs.

8 CHROMATING

The barbed wire may also be given protective chromate conversion coating as per agreement with the purchaser. This shall conform to IS 1340.

9 FREEDOM FROM DEFECTS

9.1 The line and point wires shall be circular in section,

free from scales and other defects and shall be uniformly galvanized.

9.2 The line wire shall be in continuous lengths and shall not contain any welds other than those in the rod before it is drawn. The distance between two successive weldings in the line wire of finished barbed wire shall not be less than 15 m. There shall be no splicing.

10 DESIGNATION

A galvanized steel barbed wire of Type A and of size

designation 1 shall be designated as:

Steel Barbed Wire, A-1 IS 278

11 SAMPLING

Unless otherwise agreed to between the manufacturer and the purchaser, the sampling plan as given in Annex A shall be followed.

12 TESTS

12.1 Tensile Test

The completed barbed wire and the line wire shall have minimum breaking load and tensile strength respectively as specified in Table 2. The test on the line wire shall be carried out in accordance with IS 1608. The method of testing the completed barbed wire shall be subject to agreement between the manufacturer and the purchaser.

Table 2 Tensile Properties

Sl No.	Size of Line Wire mm	Tensile Strength of Line Wire N/mm ²	Minimum Breaking Load of Completed Barbed Wire kN
(1)	(2)	(3)	(4)
i)	2.50	390-590	3.7
ii)	2.24	390-590	3.0

12.2 Zinc Coating

12.2.1 Line Wire

The galvanized coating shall conform to the requirements for any one of the type of coating as given in IS 4826 as per agreement with the purchaser. The coating requirements of electrogalvanized wire shall conform to the requirements for any one of the type as given in IS 12753 as per agreement with the purchaser.

12.2.2 Point Wire

The point wire shall be tested only for mass of zinc coating and shall be tested before fabrication. The wire

shall meet the requirements as laid down for medium coated wire in IS 4826 or IS 12753 subject to reduction of not more than 15 percent of the values specified therein. A total number of 5 barbs shall be employed for conducting the test and the points of the barbs shall be cut before subjecting them to the test.

NOTES

1 If wire is tested for uniformity as per IS 2633 after barbing, the requirement of Preece test is to be reduced by one dip of half minute.

2 The Preece test as per IS 2633 shall not be applicable in case of aged and weathered barbed wire.

12.3 Ductility Test

The line wire shall be subjected to the wrapping test in accordance with IS 1755. The line wire shall withstand wrapping and unwrapping eight turns round its own diameter without fracture.

13 MARKING

13.1 Every reel of barbed wire shall be marked legibly with the name of the manufacturer, the type of barbed wire, the diameters of the line and point wires, barb spacing and length and/or mass of the reel.

13.2 BIS Certification Marking

Each reel of barbed wire may also be marked with Standard Mark.

13.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which a licence for the use of Standard Mark may be granted to the manufacturers or producers may be obtained from the Bureau of Indian Standards.

14 COILING AND PACKING

Unless otherwise agreed to between the supplier and the purchaser, the barbed wire shall be supplied in metal or wooden reels. Each reel of barbed wire shall be wound and fastened compactly.

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ANNEX A

(Clause 11)

SAMPLING PLAN

A-1 SCALE OF SAMPLING

A-1.1 Lot

All the reels of galvanized steel barbed wire of the same type and same designation manufactured under essentially similar conditions shall constitute the lot.

A-1.2 For ascertaining the conformity of the lot to the requirements of the specifications, tests shall be carried out on each lot separately. The number of reels to be selected at random for this purpose shall be in accordance with Table 3.

Table 3 Scale of Sampling

Sl No.	Number of Reels in the Lot	Number of Reels to be Selected
(1)	(2)	(3)
i)	Up to 25	3
ii)	26 to 50	4
iii)	51 to 150	5
iv)	151 to 300	7
v)	301 and above	10

A-2 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

A-2.1 All the reels selected according to **A-1.2** shall

be examined for diameter of line wire and point wire; distance between barbs, length of barbs and freedom from defects. If all the reels are found satisfactory for each of the above characteristics, the lot shall be considered conforming to the requirements of these characteristics.

A-2.2 When the lot is found satisfactory in **A-2.1**, one test specimen each from every selected reel shall be taken and subjected to tensile test (*see 12.1*), zinc coating test (*see 12.2*), and ductility test (*see 12.3*). The lot shall be declared conforming to the requirements of these characteristics if all the test specimens satisfy the relevant requirements.

A-2.3 When so desired by the purchaser, one sample for the chemical analysis shall be drawn. The lot shall be declared conforming to the requirements when the test results satisfy the relevant requirements.

A-2.4 The lot shall be declared conforming to the requirements of this specification, if it is found satisfactory according to **A-2.1** to **A-2.3**.

A-2.5 In case the lot is not found satisfactory according to **A-2.1** to **A-2.3**, then the lot shall be subjected to 100 percent retesting.

ANNEX B

(Foreword)

COMMITTEE COMPOSITION

Wire Ropes and Wire Products Sectional Committee, MED 10

Organization

Directorate General of Mines Safety, Dhanbad

Amar Promoters Pvt Ltd, Solan

Bharat Coking Coal Ltd, Dhanbad

Bharat Wire Ropes Ltd, Mumbai

Central Institute of Mining and Fuel Research, Dhanbad

Directorate General Factory Advice Service & Labour Institutes, Mumbai

Directorate General of Aeronautical Quality Assurance, New Delhi

Representative(s)

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DEPUTY DIRECTOR (MECH, HQ) (*Alternate*)

SHRI VIRENDER AGARWAL

SHRI JATINDER AGARWAL (*Alternate*)

SHRI RAMJI SAHAY

SHRI D. M. SHAH

SHRI ASHWINI LOKHANDE (*Alternate*)

SHRI AWADHESH MAHTO

SHRI S. K. RITOLIA (*Alternate*)

SHRI G. M. E. K. RAJ

SHRI S. N. BORKER (*Alternate*)

SHRI S. B. PRASAD

SHRI SANJAY CHAWLA (*Alternate*)

<i>Organization</i>	<i>Representative(s)</i>
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Directorate General of Supplies & Disposals (Quality Assurance Wing), New Delhi	SHRI R. K. AGARWAL SHRI AKHILESH KUMAR (<i>Alternate</i>)
Directorate of Quality Assurance, New Delhi	COL P. K. SRIVASTAVA COL V. V. KADAM (<i>Alternate</i>)
Eastern Coalfields Ltd, Kolkata	SHRI CHATTERJEE SHRI KAPIL K. RAI (<i>Alternate</i>)
Ministry of Shipping, New Delhi	SHRI A. R. RAO SHRI D. J. BASU (<i>Alternate</i>)
National Test House, Kolkata	SHRI S. P. ROY SHRI R. N. RAM (<i>Alternate</i>)
Oil and Natural Gas Commission, Dehradun	SHRI R. K. GARG SHRI P. K. SOOD (<i>Alternate</i>)
Orient Wire Ropes, Indore	SHRI SAMEER GOLWELKAR SHRI SHISHIR AKARTE (<i>Alternate</i>)
Paradip Port Trust, Paradip	SHRI B. B. PANIGRAHI SHRI MOHAN PATEL KHETRA (<i>Alternate</i>)
South Eastern Coalfields Ltd, Bilaspur	SHRI S. K. MISHRA SHRI G. RAMASWAMI (<i>Alternate</i>)
Tata Steel Ltd, Dhanbad	SHRI SOUMENDU K. MAJHI SHRI A. K. SIL (<i>Alternate</i>)
The Shipping Corporation of India Ltd, Mumbai	SHRI G. S. BHALLA CAPT R. MODI (<i>Alternate</i>)
The Singareni Collieries Co Ltd, Andhra Pradesh	SRI IVN PRASADA RAO SRI P. V. RAGHAVA RAJU (<i>Alternate</i>)
Usha Breco Ltd, Dist Ghaziabad, UP	SHRI RAJESH PRASAD SHRI MANOJ PANWAR (<i>Alternate</i>)
Usha Martin Industries Ltd, Ranchi	SHRI SUBRATA DUTTA SHRI SBN SHARMA (<i>Alternate</i>)
Vidarbha Hardware Industries, Akola	SHRI OM PRAKASH DALMIA SHRI SANJAY O. DALMIA (<i>Alternate</i>)
BIS Directorate General	SHRI C. K. VEDA, Scientist 'F' & Head (MED) Representing Director General (<i>Ex-officio</i>)

Member Secretary
SHRI D. K. DAS
Scientist 'E' (MED), BIS

Bureau of Indian Standards

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Amendments Issued Since Publication

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