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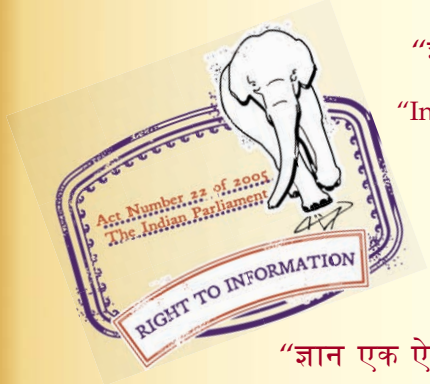
IS 2721 (2003): Galvanized Steel Chain Link Fence Fabric
[MED 10: Wire Ropes and Wire Products]



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जस्तीकृत इस्पात चेन लिंक जेगले का कपड़ा — विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

GALVANIZED STEEL CHAIN LINK FENCE FABRIC — SPECIFICATION

(Second Revision)

ICS 77.140.65; 91.090

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

July 2003

Price Group 3

FOREWORD

This Indian Standard (Second 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 issued in 1964. The first revision of this standard entitled 'Specification for galvanized steel wire, chain link fences' was taken up in order to bring the standard in line with modern manufacturing practices. Following were some of the important changes made in the first revision:

a) The requirement pertaining to straining posts, struts and other fittings was deleted as it had been felt that this was not the appropriate standard for inclusion of these items.
b) In view of the above, the title of the standard was modified.
c) A table containing the detailed dimensions of various sizes of fabric replaced the table giving the purpose for which the various fabrics were to be employed.
d) Reference was made to IS 280 : 1978 'Mild steel wire for general engineering purposes (*third revision*)' as far as the material is concerned.
e) Test requirements were clearly laid down.

As a result of further experience gained in modern manufacturing practices, multiple civil applications and purchaser's requirements during the recent years, it has been decided to revise this standard aligning the requirements with the practices being followed by the industry and the following changes have been made:

a) Type of selvage has been introduced.
b) Length and width of fabric has been made as per purchaser's requirement.
c) The zinc-coating requirement has been modified to heavy coating.
d) Line wire has been provided only for fencing purposes for all sizes.
e) Packing clause has been suitably amended.
f) Additional mesh sizes in various wire diameters have been introduced.
g) Tolerances on mesh sizes have been marginally increased.
h) Sampling plan for acceptance test as per IS 280 has been introduced.

In the formulation of this standard, assistance has been derived from the following publications:

BS 4102 : 1971 'Specification for steel wire for fences,' issued by the British Standards Institution.

ASTM A 392 : 1996 'Specification for zinc-coated steel chain link fence fabric', issued by the American Society for Testing and Materials.

DIN 1199 : 1970 'Chain link fencing', issued by Deutsches Institut für Normung (DIN).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or 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 CHAIN LINK FENCE FABRIC — SPECIFICATION

(Second Revision)

1 SCOPE

1.1 This standard covers the requirements for galvanized steel chain link fence fabric intended for various purposes.

1.2 This standard does not cover the requirements pertaining to straining posts, struts, base plates and other fittings.

2 REFERENCES

The following standards contain provisions, which through reference in this text constitute provisions 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 : 1978	Mild steel wire for general engineering purposes (*third revision*)
1608 : 1995	Mechanical testing of metals — Tensile testing (*second revision*)
1717 : 1985	Method for simple torsion test for wire (*second revision*)
1755 : 1983	Method for wrapping test for metallic wire (*first revision*)
4826 : 1979	Hot dripped galvanized coatings on round steel wires (*first revision*)
4905 : 1968	Methods for random sampling
12753 : 1989	Electro galvanized coatings on round steel wire — Specification

3 TERMINOLOGY

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

3.1 Chain-Link Fence Fabric — A fencing material made from steel wire helical wound and interwoven in such a manner as to provide a continuous mesh without knots or ties except in the form of knuckling or of twisting the ends of the wires to form the selvage of the fabric.

3.2 Selvage — Selvage is the type of twist on the top and bottom ends of the fabric.

3.3 Knuckling — The type of selvage obtained by interlocking adjacent pairs of wire ends and then bending the wire ends back into a loop.

3.4 Twisting — The type of selvage obtained by twisting adjacent pairs of wire ends together in a close helix.

4 TYPE OF SELVAGE

The fabric shall be supplied in any of the following types of selvages given in Fig.1 as per the requirement of the purchaser:

4.1 Both ends of the fabric twisted (*see* Fig. 1A).

4.2 One end of the fabric knuckled and the other end twisted (*see* Fig. 1B).

4.3 Both ends of the fabric knuckled (*see* Fig. 1C).

4.4 Both ends of the fabric without knuckling and twisting (*see* Fig. 1D).

5 MATERIAL

The mesh wire and the line wire of the fabric shall be manufactured from galvanized steel wire conforming to IS 280, having a tensile strength within the range of 400 to 550 MPa.

6 DIMENSIONS AND TOLERANCES

6.1 Dimensions and tolerances shall be as given in **6.2**, **6.3**, **6.4**, **6.5** and Table 1.

6.2 Mesh Size

The mesh size shall be determined by measuring the minimum clear distance between the wires forming the parallel sizes of the mesh when measured in normal stretched condition. The mesh sizes shall be as given in Table 1.

6.3 Width

The width of fabric shall be the overall dimension from one extreme line wire to other extreme line wire and shall be checked in fully stretched condition. The fabric shall be manufactured in widths of 0.90 m, 1.20 m, 1.50 m, 1.80 m, 2.00 m, 2.50 m, and 3.00 m or as per the requirement of the purchaser. The tolerance on the width shall be ± 0.7 of the mesh size.

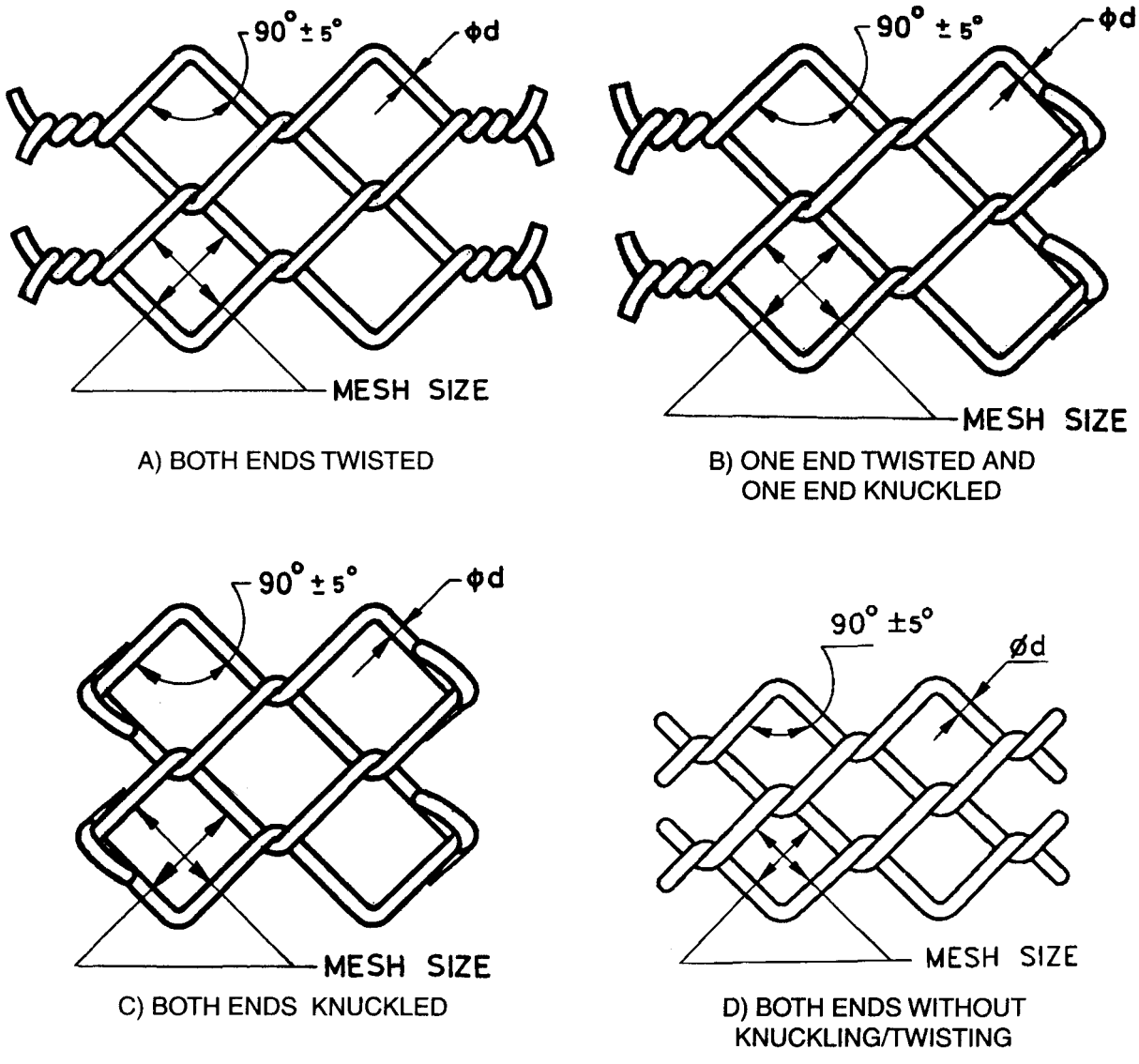

FIG. 1 TYPE OF SELVAGE

6.4 Length

The fabric shall be supplied in rolls of 5.0 m, 10.0 m, 15.0 m, 20.0 m and 25.0 m or as per the requirement of the purchaser. The supplied length shall not be less than the above values when measured in fully stretched condition.

6.5 Tolerance on Wire Diameter

Tolerances permitted on the diameter of mesh and line wire shall be as given in IS 280.

7 WORKMANSHIP AND FINISH

7.1 Each roll shall be warranted to contain no weld joint or splice whatsoever. The wire shall be circular and shall be free from scales, irregularities, imperfections, flaws, sand splits and other defects. The zinc coating shall be smooth, even and bright.

7.1.1 The rust formation on the cut ends of the wire at the fabric selvages are inherent characteristics of this material and do not warrant rejection of the fabric.

7.2 Line Wire

The fabric shall be provided with heavily coated galvanized line wires, as given in Table 1 to act as additional selvage to strengthen the fabric when used for fencing purposes or as per the requirement of the purchaser. The line wire may be supplied separately in coils/bundles/cut lengths to be used for fencing purposes. The line wires are required to be inserted after erecting the fabric with straining posts. Two number of line wires for fabric of height upto 2 m to be provided one each at top and bottom of the fabric. Three numbers of line wire for fabric of height 2.50 m and more to be provided one each on top, middle and bottom of the fabric.

Table 1 Dimensions and Tolerances

(*Clauses* 6.1, 6.2 *and* 7.2)

Mesh Size	Nominal Dia of Mesh Wire	Line Wire		
		Diameter	Number of Wires	
mm	mm	mm	Up to and including 2 m width	Above 2 m width
(1)	(2)	(3)	(4)	(5)
25 ± 3	2.00	2.50	2	3
	2.50	3.15	2	3
	3.15	4.00	2	3
40 ± 4	2.00	2.50	2	3
	2.50	3.15	2	3
	3.15	4.00	2	3
	4.00	4.50	2	3
50 ± 4	2.50	3.15	2	3
	3.15	4.00	2	3
	4.00	4.50	2	3
	4.50	5.00	2	3
63 ± 4	3.15	4.00	2	3
	4.00	4.50	2	3
	4.50	5.00	2	3
75 ± 4	3.15	4.00	2	3
	4.00	4.50	2	3
	4.50	5.00	2	3
	5.00	5.50	2	3
100 ± 5	3.15	4.00	2	3
	4.00	4.50	2	3
	4.50	5.00	2	3
	5.00	5.50	2	3
125 ± 5	4.00	4.50	2	3
	4.50	5.00	2	3
	5.00	5.50	2	3
150 ± 5	4.00	4.50	2	3
	4.50	5.00	2	3
	5.00	5.50	2	3

NOTE — Sizes other than those mentioned above shall be supplied subject to agreement between the purchaser and the manufacturer.

8 GALVANIZING

The chain link fence fabric shall have zinc coating of type 'heavy' as given in IS 4826 or in IS 12753.

9 TESTS FOR FABRIC

9.1 Test on Wires

9.1.1 *Tensile Test*

The tensile strength of mesh and line wire when tested in accordance with IS 1608 shall be within the range of 400 to 550 MPa.

9.1.2 *Wrapping Test*

The mesh and line wires shall be subjected to wrapping test in accordance with IS 1755. The wires shall not break or split when wrapped eight times round its own diameter and subsequently straightened.

9.1.3 *Twist Test*

The mesh and line wires on a length equal to 100 diameters between vices, shall withstand not less than 18 twists (*see* IS 1717).

9.1.4 *Bend Test*

Mesh wire and line wire of 5 mm diameter and above shall be subjected to this test. The wire shall withstand being bent through an angle of 90° round a former of diameter equal to twice its own diameter without breaking or splitting.

9.2 Galvanizing Test on Complete Fabric

The line wire shall meet the requirements as laid down for heavy coating of IS 4826 or IS 12753. The mesh wire shall meet the requirement as laid down in IS 4826 or IS 12753 providing up to 10 percent less than the minimum mass of zinc coating specified and to withstand one dip of half-minute duration less than that specified. The specimens shall include straight sections and shall not include either twists or knuckles.

10 SAMPLING

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

11 PACKING

Each bundle/roll of fabric shall be suitably bound and fastened compactly. If required by the purchaser, each bundle/roll shall be protected by suitable wrapping of gunny jute or canvas fabric.

12 CERTIFICATION AND REPORTS

When required by the purchaser in the contract or order, a producer or supplier certification that the material was manufactured in accordance with this specification and has been found to meet the requirements shall be given. When specified in the purchase order or contract, a report of the test results shall be furnished.

13 MARKING

13.1 Each roll shall be provided with a metal or cloth label bearing the following information:

a) Manufacturer's name and/or trade-mark,
b) Lot number and roll number,
c) Mesh size and diameter of line and mesh wires,
d) Length and width of the fabric, and
e) Any other particular specified by the purchaser.

13.2 BIS Certification Marking

13.2.1 Each roll may also be marked with the Standard Mark.

13.2.1.1 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 the Standard Mark may be granted to the manufacturers or the producers may be obtained from the Bureau of Indian Standards.

ANNEX A

(*Clause* 10)

SAMPLING AND CRITERIA FOR CONFORMITY

A-1 LOT

A-1.1 In any consignment, all the rolls/bundles of fabric of the same mesh wire diameter, mesh size, width of the fabric and length of the bundle/roll, manufactured under similar condition shall be grouped together to constitute a lot.

A-1.1.1 Samples shall be taken from each lot and tested for conformity to the standard.

A-2 SAMPLING

A.2.1 The number of rolls/bundles taken from a lot shall be according to Table 2. These samples shall be taken on random basis (*see* IS 4905).

Sample rolls of complete fabric selected shall be checked for dimensional requirements, namely mesh size, wire diameter, length, width, selvage and workmanship.

A-3 PREPARATION OF SAMPLES AND NUMBER OF TESTS

A-3.1 Tests for Physical Requirements

From the coils selected from col 1 and 2 of Table 2, adequate length of test piece shall be cut from each end and subjected to physical tests, namely, size, workmanship and finish, tensile, bend, twist, wrapping and coating tests. A test piece failing in any one of the requirements shall be called a defective. If the defectives found are less than or equal to the permissible number of defectives specified in col 3 of Table 2, the lot shall be considered to have conformed to physical requirements.

A-3.2 Tests for Chemical Requirements

Unless otherwise agreed, the following procedure shall be followed for chemical equirements:

From those test pieces, which have conformed to physical requirements, further test pieces shall be selected at random according to col 4 of Table 2. These samples shall be tested for all the chemical requirements. If a test piece fails to meet the respective chemical requirement, it shall be called a defective. The lot shall be considered to have conformed to the chemical requirements if all the individual test pieces tested for chemical requirements pass the test.

A-4 CRITERIA FOR CONFORMITY

A-4.1 A lot shall be considered to have conformed to the requirements of the specification if **A-3.1** and **A-3.2** are satisfied.

Table 2 Scale of Sampling and Permissible Number of Defectives

(*Clause* A-2.1)

No. of Bundles/ Rolls in a Lot	No. of Bundles/ Rolls for Physical/ Dimensional Requirements[1)]	Permisible Number of Defective Bundles/ Rolls	No. of Tests for Chemical Require-ments
(1)	(2)	(3)	(4)
Up to 25	2	0	1
26 to 50	3	0	1
51 to 150	5	0	2
151 to 300	8	1	2
301 and above	13	1	2

[1)] Testing as per **9.1.1** to **9.1.4** shall be done on wires (of coils used in the fabric) before fabric is made.

ANNEX B

(Foreword)

COMMITTEE COMPOSITION

Wire Ropes and Wire Products Sectional Committee, ME 10

Organization	*Representative(s)*
Directorate General of Mines Safety, Dhanbad	SHRI D. SAHA (***Chairman***) SHRI S. P. BANSAL (*Alternate*)
Amar Promoters Pvt Ltd, Solan	SHRI VIRENDER AGARWAL SHRI JATINDER AGARWAL (*Alternate*)
Bharat Coking Coal Ltd, Dhanbad	SHRI R. K. PRASAD
Bharat Wire Ropes Ltd, Mumbai	SHRI D. M. SHAH SHRI S. N. SINGH (*Alternate*)
Central Mining Research Institute, Dhanbad	SHRI S. P. CHAUDHARY SHRI A. MAHATO (*Alternate*)
Directorate General of Aeronautical Quality Assurance, New Delhi	SHRI S. B. PRASAD SHRI SANJAY CHAWLA (*Alternate*)
Directorate General of Civil Aviation, New Delhi	SHRI R. C. GUPTA SHRI M. M. KAUSHAL (*Alternate*)
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Fort William Industries Ltd, Hooghly	SHRI J. L. RATHI SHRI BASUDEB BANERJEE (*Alternate*)
Ministry of Surface Transport, New Delhi	SHRI G. P. ROY SHRI T. K. DUTTA (*Alternate*)
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Usha Martin Industries Ltd, Ranchi	SHRI RANA PRATAP SHRI K. K. SENGUPTA (*Alternate*)
Vidarbha Hardware Industries, Akola	SHRI O. P. DALMIA SHRI SANJAY K. DALMIA (*Alternate*)
BIS Directorate General	SHRI M. L. CHOPRA, Director and Head (MED) [Representing Director General (*Ex-officio*)]

Member Secretary
SHRI P. VENKATESWARA RAO
Joint Director (MED), BIS

Bureau of Indian Standards

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

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BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 2323 0131, 2323 33 75, 2323 9402

Telegrams : Manaksanstha
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Regional Offices :		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110 002	2323 7617, 2323 3841
Eastern	: 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi, KOLKATA 700 054	2337 8499, 2337 8561, 2337 8626, 2337 9120
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