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(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)
BUREAU OF INDIAN STANDARDS
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प्रारंभिक मसौदा

हमारा संदर्भ : सीईडी 54/टी-22 **17 दिसंबर 2024**

तकनीकी समिति : कंक्रीट प्रबलन विषय समिति, सीईडी 54

प्राप्तकर्ता :

क) सिविल इंजीनियरी विभाग परिषद्, सीईडीसी के सभी सदस्य
ख) सीईडी 54 के सभी सदस्य
ग) रूचि रखने वाले अन्य निकाय

प्रिय महोदय/महोदया,

निम्नलिखित भारतीय मानक का मसौदा संलग्न हैं:

प्रलेख संख्या	शीर्षक
सीईडी 54 (21706)P	**कंक्रीट प्रबलन के लिए कोल्ड रीड्यूस्ड इस्पात तार फैब्रिक – विशिष्टि का भारतीय मानक मसौदा (आईएस 1566 का तीसरा पुनरीक्षण)** **(ICS: 91.100: 77.140.15)**

कृपया इस मसौदे की जाँच करें और इसमें और सुधार के संबंध में अपनी सम्मतियाँ साझा करें।

सम्मतियाँ भेजने की अंतिम तिथि: 07/01/2025

टिप्पणियाँ, यदि कोई हों, बीआईएस ई-गवर्नेंस पोर्टल https://www.services.bis.gov.in/php/BIS_2.0/WCDraft/comment_pdraft.php के माध्यम से ऑनलाइन भेजी जा सकती हैं।

वैकल्पिक रूप से, टिप्पणियाँ संलग्न प्रारूप में भी दर्ज की जा सकती हैं और ced54@bis.gov.in या nishikant.singh@bis.gov.in पर ईमेल की जा सकती हैं।

आपको अपनी टिप्पणियाँ सबमिट करने के लिए लॉग इन करने की आवश्यकता हो सकती है, कृपया लॉग इन करने के लिए अपने मोबाइल नंबर (बीआईएस को प्रदान किया गया) और ओटीपी प्रावधान का उपयोग करें।

यदि कोई सम्मति प्राप्त नहीं होती है अथवा सम्मति में केवल भाषा संबंधी त्रुटि हुई तो हम मान लेंगे कि प्रारंभिक मसौदे के लिए आपका अनुमोदन प्राप्त हुआ है। यदि सम्मति तकनीकी प्रकृति की हुई तो उसे विषय समिति के अध्यक्ष के परामर्श से आवश्यक कार्रवाई के लिए विषय समिति के सामने रखा जाएगा।

धन्यवाद।

भवदीय
(**निशिकांत सिंह**)
सदस्य सचिव सीईडी 54
वैज्ञानिक 'डी' (सिविल इंजीनियरिंग)
ई-मेल: nishikant.singh@bis.gov.in

संलग्न: उपरलिखित

भारतीय मानक ब्यूरो
(उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण मंत्रालय, भारत सरकार)
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PRELIMINARY DRAFT

Our Reference: CED 54/T- 22 **17 December 2024**

Technical Committee: Concrete Reinforcement Sectional Committee, CED 54

Addressed To:

a) All Members of Civil Engineering Division Council, CEDC
b) All Members of CED 54
c) All others interested

Dear Sir/Madam,

Please find enclosed the following document:

Doc No.	*Title*
CED 54 (21706)P	**Draft Indian Standard Cold Reduced Steel Wire Fabric For Concrete Reinforcement — Specification (Third Revision of IS 1566) (ICS 91.100: 77.140.15)**

Kindly examine the attached draft and forward your comments for further improvement.

Last Date for comments: 07 January 2025

Comments if any, may be sent online through the BIS e-governance portal at https://www.services.bis.gov.in/php/BIS_2.0/WCDraft/comment_pdraft.php.

Alternatively, comments may also be recorded in the enclosed format and emailed at ced54@bis.gov.in or at nishikant.singh@bis.gov.in.

You may be required to login to submit your comments, kindly use your mobile number (provided to BIS) and the OTP provision to login.

In case no comments are received, or comments received are of editorial nature, kindly permit us to presume your approval for the above document. However, in case comments of technical nature are received, then in consultation with the Chairperson, CED 54 the comments may be put up to the Sectional Committee for necessary action.

Thanking you,

Sd/-
(Nishikant Singh)
Member Secretary CED 54
Scientist 'D' (Civil Engineering)
E-mail: nishikant.singh@bis.gov.in

Encl: As above

FORMAT FOR SENDING COMMENTS ON THE DOCUMENT

[Please use A4 size sheet of paper only and type within fields indicated. Comments on each clause/sub-clause/ table/figure, etc, be stated on a fresh row. Information/comments should include reasons for comments, technical references and suggestions for modified wordings of the clause. **Comments through** https://www.services.bis.gov.in/php/BIS_2.0/WCDraft/comment_pdraft.php **shall be appreciated**.]

Doc. No.: CED 54 (21706)P **BIS Letter Ref**: CED 54/T-22

Title: Draft Indian Standard COLD REDUCED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT — SPECIFICATION (Third Revision of IS 1566) (ICS 91.100: 77.140.15)

Last date of comments: **07 JANUARY 2025**

Name of the Commentator/ Organization: _____

Sl No.	Clause/ Para/ Table/ Figure No. commented	Comments/ Modified Wordings	Justification of Proposed Change
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NOTE- Kindly insert more rows as necessary for each clause/table, etc

BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

Draft Indian Standard

COLD REDUCED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT — SPECIFICATION

(*Third Revision of IS 1566*)

Concrete Reinforcement Sectional Committee, CED 54	Last Date of Comments: **07 January 2024**

FOREWORD

(*Formal clauses to be added later*)

This standard was first published in 1960 and subsequently revised in 1967 and 1982.

In the last revision of the standard, apart from adopting SI units in specifying the various physical requirements, provisions of the standard were revised based on the revision of the concerned Indian Standards on methods of physical and chemical tests for steel.

The present revision has been taken up with a view to modifying the earlier provisions in the light of experience gained during the use of this standard by both the manufacturers and the users.

In this revision, the following major modification have been incorporated:

a) The titles of standard have been accordingly modified to ‘Cold reduced steel wire fabric for concrete reinforcement — specification’.
a) The standard previously covered the requirement for hard-drawn steel wire fabric consisting of hard-drawn steel wire. The scope of the standard has been extended to cover wires made from cold rolling process, all references to “Hard drawn” replaced to “cold reduced”.
b) Definitions relevant to standard are cross-referred to IS 432 (Part 2) and new definition relevant to fabric added as per ISO 6935-3 Welded fabric is added.
c) Reverse bend test has been replaced by bend test and rebend test as later are suitable for low diameters.
d) Addition of weld shear test in Annex A and limit set to at least 30% of proof stress and addition of weld penetration range of 6% - 15%.
e) Table of standard sizes is modified and general guidelines for generic designation added.

In the formulation of this standard due weightage has been given to international coordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country.

Assistance has been derived from the following International Standard in the formulation of this standard:

ISO 6935-3:1992 Steel for the reinforcement concrete: Part 3: Welded fabric

ISO 15630-1:2019 Steel for the reinforcement and prestressing of concrete Test method Part 1: Reinforcing bars, rods and wire

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 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

Draft Indian Standard

SPECIFICATION FOR COLD REDUCED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT

(*Third Revision of IS 1566*)

Concrete Reinforcement Sectional Committee, CED 54	Last Date of Comments: **07 January 2025**

1 SCOPE

1.1 This standard covers the requirements for cold reduced steel wire fabric consisting of cold reduced steel wires for use as concrete reinforcement

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 are valid. All standards are subject to revision, and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
IS 432 (Part 2) : 1982	Specification for mild steel and medium tensile steel bars and hard-drawn steel wire for concrete reinforcement : Part 2 Hard-drawn steel wire (*third revision*)
IS 1387 : 1993	General requirements for the supply of metallurgical materials (*second revision*)
IS 1608 (Part 1) : 2022 /ISO 6892-1 : 2019	Metallic materials — Tensile testing: Part 1 Method of test at room temperature (*fifth revision*)

3 TERMINOLOGY

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

3.1 Fabric — A geometrical arrangement of longitudinal and Transverse wires that are arranged substantially at right angles to each other and welded together at all points of intersection.

3.2 Mesh Size — The pitch or centre to centre distance of longitudinal wires by the pitch or centre to centre distance of transverse wires.

3.3 Longitudinal Wire — Wire in the manufacturing direction of the fabric.

3.4 Length of Fabric — The longest side of the fabric, irrespective of the manufacturing direction.

3.5 Overhang — The length of longitudinal or transverse wires beyond the centre of the outer crossing wire in a fabric.

3.6 Transverse Wire — Wire perpendicular to the manufacturing direction of the fabric.

3.7 Width of Fabric — The shortest side of the fabric, irrespective of the manufacturing direction.

4 TYPES

4.1 Cold Reduced steel wire fabric shall be of the following two types:

a) Oblong mesh; and
b) Square mesh.

4.2 The fabric may be designated for ordering purposes in terms of:

a) Spacing in both directions;
b) Wire diameters in both directions;
c) Width of Mesh;
d) Length of Mesh;
e) Surface Condition of Wire (Plain/Ribbed/Indented) with all dimensions in mm.

Example:

Cold Reduced steel wire fabric, 200 x 100 - 8.0 x 6.0 - 2200 x 4600 - Ribbed as per IS 1566.

4.3 The mesh sizes, weights and sizes of wires for square as well as oblong welded wire fabric being commonly manufactured in the country are given in Annex B for information.

5 MATERIAL

5.1 Quality of Steel

The wire used in the manufacture of fabric shall be cold reduced steel wire conforming, in all respects, to the requirements of IS 432 (Part 2) and suitable for welding. When so requested by the purchaser, the manufacturer or the supplier shall supply certificates to this effect.

6 MANUFACTURE

6.1 The fabric shall be formed by spacing the main and the transverse wires, which shall be fixed at their point. of intersection by electric resistance/ laser machine welding vide fusion of the parent metal of the intersecting wires without addition of foreign/filler metal to provide Shear resistant connections as per Clause 11.2 It shall be fabricated and finished in a workmanlike manner which will assure accurate spacing and alignment of all members of the finished fabric to give substantial square or rectangular openings.

6.1.1 Butt joints in the wires of the fabric shall be electrically resistance welded and the joints shall be staggered.

6.1.2 *Weld Penetration*

Weld penetration (Joint thickness reduction) should be in the range of 6 percent Min. to 15 percent Max measured on the total combined joint thickness towards achieving expected Weld Shear strength. This can be checked by using Micro-meter to measure individual Wire Diameters d_1 & d_2 at the intersection and the total welded joint thickness d_{tot} This is a manufacturing guidance or field check recommendation governed finally by Weld Shear Strength requirement vide 11.2.

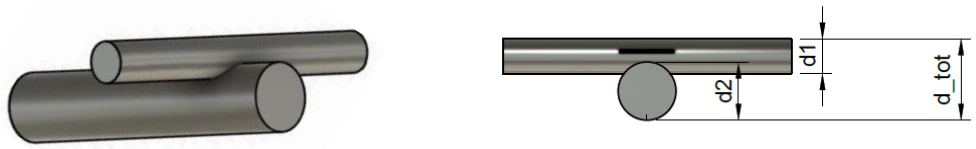

Fig.1

$$\% \text{ Weld Penetration} = \frac{[(d_1+d_2)-d_{tot}]}{d_1+d_2} \quad (>6\% \text{ and } < 15\%)$$

7 DIMENSIONS

7.1 Mesh sizes, weight and sizes of wires for square and oblong welded-wire fabric shall be as agreed to between the purchaser and the manufacturer.

7.2 The diameters of crossing wires in fabric with different Longitudinal and transverse wires shall meet the following requirement:

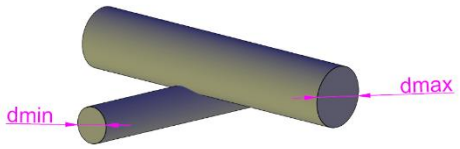

Fig.2 Longitudinal and transverse wires

$$d_{min} > 0.6\, d_{max}$$

where

d_{max} is the nominal diameter of the thickest wire;

d_{min} is the nominal diameter of the transverse wire.

7.3 The recommended spacing of longitudinal wires is a multiple of 50 mm and The recommended spacing of Transverse wires is a multiple of 25 mm.

7.4 The recommended overhang, u, is not less than 25 mm.

8 SIZES OF SHEETS OR ROLLS

8.1 The width of the sheet or roll shall be such as to fit in with the modular size of 10 cm module and the length of the sheet or roll shall be that which is mutually agreed to between the manufacturer and the purchaser subject to the tolerances specified 9.

8.1.1 The width or length of the fabric shall be specified end to end gross distance, unless otherwise specified. Transverse wire shall project beyond the centre line of each longitudinal edge wire for a distance equal to half the pitch of the main wires, unless otherwise specified.

9 MASS

9.1 Calculation of Mass

The nominal mass of fabric shall be calculated on the basis that steel weighs 0785 kg/cm^2 of nominal cross-sectional area per metre run.

9.2 The actual mass of the fabric shall be determined by weighing a sheet or sheets of any convenient size, and if possible at least one square metre, with the edges trimmed so that the longitudinal wires protrude by a distance equal to half the distance between the transverse wires, and the transverse wires produce a distance equal to half the distance between the longitudinal wires.

10 TOLERANCES

10.1 Subject to the tolerances on wire diameter specified in IS 432 (Part 2), the tolerances shall be as in 10.2 to 10.4.

10.2 Tolerance on Size of Mesh

The number of spaces between the external wires in a sheet or roll shall be determined by the nominal pitch. The centre distance between two adjacent wires shall not vary by more than greater of ± 10 mm or ± 7.5 percent of the nominal pitch.

10.3 Tolerance on Size of Sheet

When fabric is required to be cut to specified dimensions, the tolerance shall be as follows:

a) For dimensions of 5 m and under	25 mm under or over the specified dimension

b) For dimensions over 5 m	0.5 percent under or over the specified dimension

10.4 Tolerance on Mass of Fabric

The tolerances on the mass of fabric shall be as follows:

a)	When the specified mass is not stated to be either a maximum or a minimum	± 6 percent
b)	When the specified mass is stated to be a maximum	$\begin{matrix}+0\\-12\end{matrix}$ percent
c)	When the specified mass is stated to be a minimum	$\begin{matrix}+12\\-0\end{matrix}$ percent

11 MECHANICAL PROPERTIES

11.1 All wires of the finished fabric shall meet the minimum requirements for physical properties as prescribed in IS 432 (Part 2).

11.2 The strength of the welded joints, in newtons, shall be at least 30 percent of the specified characteristic yield or proof stress multiplied by the nominal cross-sectional area of the thicker wire of the welded joint. Test shall be conducted as per Weld Shear Test method as given in Annex A.

12 TESTS

12.1 Selection of Test Pieces

12.1.1 All test pieces shall be selected by the purchaser, and in the event of the tests being satisfactory, he shall pay the cost of the sheets from which the test pieces have been cut, or accept delivery as though such test pieces had not been cut therefrom.

12.1.2 *Test Pieces*

The test pieces for tensile and bend tests shall be so cut from the fabric that each tensile test piece shall contain one or more cross welds in its length.

12.1.3 *Identification of Specimens with the Materials*

The manufacturer shall make appropriate arrangements for the identification of the material represented by the test pieces.

12.2 Tensile Test

The tensile test shall be made on the mesh after fabrication across one or more welds to the requirements specified in IS 1608.

12.2.1 One tensile test shall be made from every 6 000 m^2 of fabric.

12.3 Bend Test

Bend test shall be made on a test piece cut from the finished product. The test piece shall be subjected to the test method as given in IS 432 (Part 2).

12.3.1 One reverse bend test shall be made from every 6 000 mt of fabric.

12.4 Rebend Test

Rebend test shall be made on a test piece cut from the finished product. The test piece shall be subjected to the test method as given in IS 432 (Part 2).

12.5 Re-tests

Should a tensile test piece break outside the middle half of its gauge length, the test may, at the manufacturer's option, be discarded and another test made on a piece cut from the same length of wire. In all other cases, should any of the test pieces first selected not fulfil the required tests, two additional test pieces in respect of each failure may be taken. Should both the additional test pieces pass the test, the material represented shall be accepted. Should either of them fail to fulfil such tests, the material represented may be rejected. The additional tests shall be carried out in the same manner in all respects as the tests herein before required to be made in the first instance.

13 DELIVERY, INSPECTION AND TESTING FACILITIES

13.1 Unless otherwise specified, general requirements relating to the supply of material, inspection and testing shall conform to IS 1387.

13.2 Delivery

All fabric reinforcement shall be delivered free from oil and grease, paint, loose mill scale, loose rust and other matter likely to adversely affect the bend with concrete. Lime wash shall be permitted unless otherwise specified by the purchaser. A sheet shall not contain any broken wires, and no broken cross welds in excess of four percent of the total number of welded joints, or half of the welded joints Li any Wire.

13.2.1 If so required by the purchaser, the manufacturer shall give a certificate that the welded wire mesh supplied conforms in all respects to the requirements of this specification.

13.3 The purchaser or his authorized representative shall be at liberty to inspect and verify the steel maker's certificate of cast analysis at the premises of the manufacturer or supplier; when the purchaser requires an actual analysis of finished material, this shall be made at a place agreed to between the purchaser and the manufacturer or the supplier.

13.4 The purchaser shall have all reasonable facilities for satisfying himself that the material is being or has been manufactured fully in accordance with the requirements of this specification and, for this purpose he shall he furnished with the test certificates

giving the results of test specified in this specification and he shall have free access to the relevant parts of the supplier's works at all reasonable times as agreed to mutually. He shall be at liberty to inspect the manufacture without interfering in any way with the normal production of the material at any stage and to reject any material which does not conform to this specification.

13.4.1 If so required by the purchaser, he shall be informed by the supplier when the material relating to the order is under manufacture.

13.4.2 The supplier shall supply labour and appliances required for testing at his premises. If facilities are not available at his own works, the supplier shall bear the cost of the tests carried out in a laboratory selected by the purchaser.

13.5 INDEPENDENT TEST

13.5.1 Should there be a dispute about the compliance of the material with this specification, the supplier and the purchaser each shall have the right to get the material tested by a mutually acceptable independent testing authority unless such disputes are within the terms of any other agreement for reference or submission to arbitration.

13.5.2 The results obtained by the independent testing authority shall be accepted as final. If the material does not comply with this specification, the cost of independent testing shall be borne by the supplier; if the material complies with this specification, the cost shall be borne by the purchaser.

13.6 Defects Revealed After Delivery

Should any material after delivery be found not to be in accordance with this specification, such material shall be deemed not to comply with this Indian Standard not withstanding any previous acceptance, provided it has not been improperly treated.

14 IDENTIFICATION AND MARKING

14.1 The manufacturer or the supplier. shall have ingots, billets, wires, fabric or bundles of fabric marked in such a way that all finished wires or fabric can be traced to the cast from which they were made. Every facility be given to the purchaser or his authorized representative for tracing the wires or fabric to the cast from which they were made.

14.2 Marking

When the material is delivered in bundles, the manufacturer shall fasten securely to every bundle a metal tag bearing a suitable identification mark.

14.3 Each bundle containing the fabric may also be marked with the ISI Certification Mark in which case the concerned test certificate shall also beat the Standard Mark.

NOTE — 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 Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard wider a well-defined system of inspection,

testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A
(*Clauses* 11.2)

WELD SHEAR TEST

The joints shall be tested for Weld Shear Strength as per using a fixture of suitable design which will prevent rotation of the transverse wire. The transverse wire shall be placed in the anvil of the testing device which is secured in the tensile machine and the load then applied to the longitudinal wire. For fabric with different diameter wires in both directions, the thicker wire shall be used as the pulling wire. Four welds selected at random from specimen representing the entire width of the fabric, exclusive of the selvage wire, shall be tested for weld shear strength.

NOTE — A suitable device for testing of weld strength is given in Fig 3.

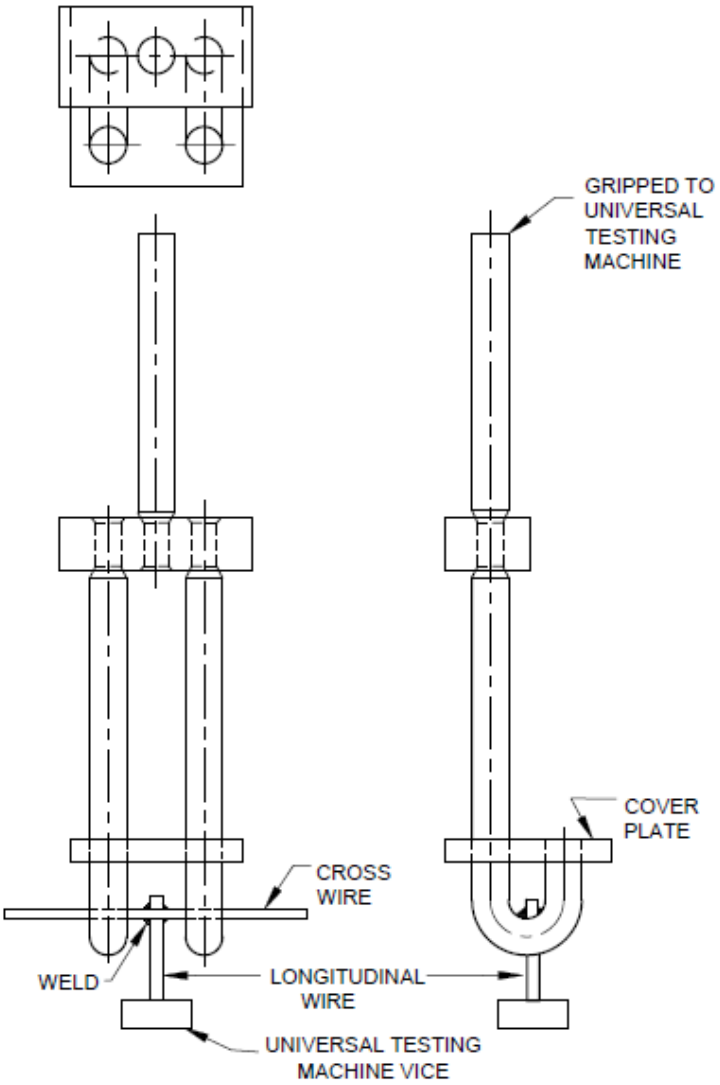

FIG. 3 TYPICAL TESTING DEVICE FOR TESTING WELD SHEAR STRENGTH

ANNEX B
(*Clauses* 4.3)

DIMENSIONS AND PROPERTIES OF HARD-DRAWN STEEL WIRE FABRIC (SQUARE AND OBLONG MESH)

SQUARE MESH

Sl No.	Mesh Size (Nominal Pitch of Wires)	Diameter of Wire Each Way	Nominal Mass per m^3
(1)	(2)	(3)	(4)
1	50	2.5	1.550
2	50	3.0	2.220
3	50	4.0	3.970
4	75	4.0	2.650
5	75	5.0	4.130
6	100	4.0	1.980
7	100	5.0	3.080
8	100	6.0	4.460
9	150	5.0	2.060
10	150	6.0	2.960
11	150	7.0	4.050
12	150	8.0	5.260
13	150	9.0	6.660
14	150	10.0	8.220
15	200	6.0	2.250
16	200	7.0	3.020
17	200	8.0	3.940
18	200	9.0	5.300
19	200	10.0	6.160

OBLONG MESH

Sl No.	Mesh Size (Nominal Pitch of Wires)		Diameter of Wires		Nominal Mass per m^3
(1)	(2)	(3)	(4)	(5)	(6)
	Main, mm	Cross, mm	Main, mm	Cross, mm	kg
20	75	300	3	2.5	0.89
21	75	300	4	2.5	1.48
22	75	300	4	3	1.53
23	75	300	5	3	2.29
24	75	300	5	4	2.44
25	75	300	6	4	3.36
26	75	300	6	5	3.55
27	75	300	8	5	5.90
28	100	150	4	3	1.39
29	100	150	5	3	1.95
30	100	150	5	4	2.25
31	100	150	6	4	2.94
32	100	150	7	4	3.76
33	100	250	5	4	1.98
34	100	250	6	4	2.67
35	100	250	7	5	3.72
36	100	250	8	6	4.94
37	100	300	4	3	1.20
38	100	300	5	5	2.10
39	100	300	5	4	1.91
40	100	300	6	4	2.60
41	100	300	6	5	2.79
42	100	300	7	4	3.42
43	100	300	7	5	3.61
44	100	300	8	5	4.56
45	100	300	8	6	4.79
46	100	300	9	6	5.86
47	100	300	10	6	7.06
48	100	300	10	8	7.64
49	150	250	5	5	1.68
50	150	250	6	5	2.14
51	150	250	7	5	2.69
52	150	300	8	6	3.44
53	150	300	10	6	4.96

54	150	300	10	8	5.54