भारतीय मानक

Indian Standard

IS 18310 (Part 3) : 2023

कृषि वस्त्रादि — कृषि एवं बागवानी सम्बंधित प्रयोजनों हेतु पक्षी से बचाव जाल — विशिष्टि

भाग 3 पक्षी से बचाव हेतु एक्सट्रुडेड जाल

Agro Textiles — Bird Protection Nets for Agriculture and Horticulture Purposes — Specification

Part 3 Extruded Bird Protection Nets

ICS 59.080.70, 65.020.20

भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली - 110002

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG

NEW DELHI - 110002

www.bis.gov.in www.standardsbis.in

August 2023 **Price Group 5**

Technical Textiles for Agrotech Applications Sectional Committee, TXD 35

FOREWORD

This Indian Standard (Part 3) was adopted by the Bureau of Indian Standards, after the draft finalized by the Technical Textiles for Agrotech Applications Sectional Committee had been approved by the Textile Division Council

Birds come in their numbers to attack crops and end up causing significant damage to the crops. Gardeners cultivating crops in areas under heavy attack by these destructive birds can protect crops with bird protection netting. The hole (mesh) in the bird protection net block birds from passing through but it allows pollinating insects to gain entrance. On the other hand, the bird protection net also allows sunlight and moisture to get to the crop. For crops that require an adequate amount of sunlight per day, the net does not propose any interference.

Nowadays these nets are also used in domestic and commercial buildings to restrict the entry of birds.

Based on the manufacturing technology, this standard is published in three parts. The other parts in the series are:

Part 1 Knotted bird protection nets
Part 2 Knitted bird protection nets

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

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.

Indian Standards

AGRO TEXTILES — BIRD PROTECTION NETS FOR AGRICULTURE AND HORTICULTURE PURPOSES — SPECIFICATION

PART 3 EXTRUDED BIRD PROTECTION NETS

1 SCOPE

1.1 This standard prescribes constructional and other performance requirements for extruded bird protection nets for agriculture and horticulture purposes to restrict the entry of birds.

1.2 The extruded bird protection nets manufactured as per this standard may also be used in domestic or commercial buildings to restrict the entry of birds inside the premises.

2 REFERENCES

The standards listed in Annex A 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 these standards.

3 TERMINOLOGY

For the purpose of this standard the definitions given in IS 16366 shall apply.

4 MATERIALS

4.1 The high density polyethylene (HDPE) used for manufacture of bird protection nets shall conform to the requirements specified in IS 10146. HDPE shall be UV stabilized by incorporating a suitable UV stabilizer so that the finished extruded bird protection net meets the requirements specified in Table 1.

5 MANUFACTURE

5.1 The extruded bird protection nets shall be made in diamond shaped apertures (*see* Fig. 1).

5.2 Colour

The colour of the extruded bird protection nets shall be as per the agreement between the buyer and the seller. The colour shall be as specified in the contract or order. In case a sample has been agreed upon and sealed, the supply shall be made in conformity with the sample in such respects.

6 TYPES

6.1 Based on the width, the knitted bird protection nets shall be classified as follows:

a) *Type* I — having width of 3m; and

b) *Type* II — having width of 6m.

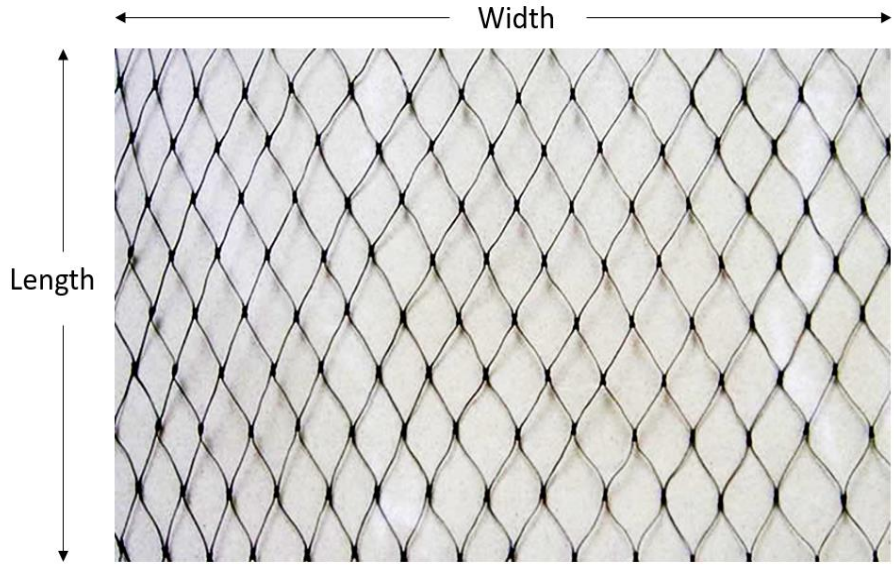

FIG.1 SCHEMATIC DIAGRAM OF EXTRUDED BIRD PROTECTION NETS WITH DIAMOND SHAPED APERTURES

7 REQUIREMENTS

The extruded bird protection nets shall conform to the requirements specified in Table 1.

Table 1 Requirements of Extruded Bird Protection Nets
(*Clause* 7)

Sl No.	Characteristic(s)	Requirement(s)		Tolerance(s)	Method of Test, Ref to
		Type I	Type II		
(1)	(2)	(3)	(4)	(5)	(6)
i)	Width, m	3	6	+3 percent 0 percent	Annex B
ii)	Mass, g/m	26	85	± 5 percent	Annex B
iii)	Mesh Size, Machine direction, mm	30	25	± 2 mm	Annex B
iv)	Mesh Size, Transverse direction, mm	30	25	± 2 mm	Annex B
v)	Thickness at joint, mm	1.5	1.3	± 10 percent	Annex B
vi)	Filament thickness, mm	0.22	0.23	± 10 percent	Annex B
vii)	Length	As declared	As declared	+ 5 percent 0 percent	Annex B
viii)	Tensile strength before UV exposure, kN/m, *Min*,			—	
	a) Machine direction	25	25		IS 5815 (Part 5)
	b) Transverse direction	25	25		
ix)	Tensile strength after UV exposure of 144 h, kN/m, *Min*,			—	
	a) Machine direction	85 percent of the actual original value	85 percent of the actual original value		Annex C and IS 5815 (Part 5)
	b) Cross machine direction				

8 PACKING AND MARKING

8.1 Packing

The bird protection nets shall be packed in roll form in length of 50 m or in bundle form or as agreed to between the buyer and the seller.

8.2 Marking

8.2.1 Each fabric roll/bundle shall be marked legibly by affixing a label with the following information:

a) Indication of the source of manufacture;
b) Declared length and width of the bird protection nets;
c) Mass per square meter of the bird protection nets;
d) Batch No. and date of manufacture; and
e) Any other information desired by the buyer.

8.3 BIS Certification Marking

The bird protection net rolls/bundles conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the bird protection net rolls/bundles may be marked with the Standard Mark.

9 SAMPLING

9.1 Lot

All bird protection nets rolls/bundles of same construction and type dispatched to a buyer against one dispatch note shall constitute a lot.

9.2 Unless otherwise agreed to between the buyer and the seller, the number of bird protection nets rolls/bundles to be selected at random from a lot shall be as given in col (3) of Table 2.

Table 2 Scale of Sampling

(*Clause* 9.2)

Sl No.	No. of Rolls/Bundles in Lot	Sample Size	Sub-Sample Size	Permissible No. of Defective Rolls/Bundles
(1)	(2)	(3)	(4)	(5)
i)	Up to 50	3	2	0
ii)	51 to 150	5	2	0
iii)	151 to 300	8	3	1
iv)	301 to 500	13	5	2
v)	501 and above	20	5	3

10 NUMBER OF TEST SPECIMENS AND CRITERIA FOR CONFORMITY

Number of test specimens and criteria for conformity shall be as given in Table 3.

Table 3 Number of Test Specimens and Criteria for Conformity

(*Clause* 10)

Sl No.	Characteristic	No. of Rolls/Bundles	Criteria for Conformity
(1)	(2)	(3)	(4)
i)	Material and manufacture, dimensions.	According to col (3) of Table 2	The defective rolls do not exceed the corresponding number given in col (5) of Table 2
ii)	All other requirements	According to col (4) of Table 2	All the test specimens shall pass the tests

ANNEX A

(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 5815 (Part 5) : 2005/ ISO 1806 : 2005	Fishing nets — Determination of mesh breaking force of netting (*second revision*)
IS 10146 : 1982	Specification for polyethylene for its safe use in contact with foodstuffs, pharmaceutical and drinking water
IS 16366 : 2015	Glossary of terms used in agrotextile
IS/ISO105-B02 : 2014	Textiles — Tests for colour fastness: Part B02 Colour fastness to artificial light Xenon arc fading lamp test

ANNEX B

[*Table* 1, *Sl No.* (i) to (vii)]

METHOD OF TEST FOR MASS, MESH SIZE, THICKNESS AT JOINT, FILAMENT THICKNESS AND DIMENSIONS OF NET

B-1 METHOD OF TEST FOR DETERMINATION OF MASS OF NET

Take a sample of extruded bird protection net by drawing a length of 1.2 m or more and lay it out in a straight line in the form of rope on a flat surface. Clamp the two free ends of the sample with adequate tension so that no slack should be observed in the rope. Place two marks on the rope 1 m apart with the help of suitable measuring scale with an accuracy of 1 mm, then remove the tension and detach the sample from the parent length by cutting cleanly at the two marks. Determine the mass, m, of the test piece and calculate the mass per metre from the result.

B-2 METHOD OF TEST FOR MESH SIZE

Take the sample used in **B-1** and lay it out extending it to the specified width as per the types given in **6.1** on a flat surface firmly gripped on all sides using suitable number of clips. Test five adjacent mesh each in machine and transverse direction and determine the average mesh size in machine and transverse direction separately. Mesh size shall be measured from inside to inside with a suitable caliper with an accuracy of 0.02 mm.

B-3 METHOD OF TEST FOR THICKNESS AT JOINT AND FILAMENT THICKNESS

Thickness at joint and filament thickness shall be measured with a suitable flat anvil micrometer with an accuracy of 0.01 mm. Test joint thickness at five points each in machine and transverse direction and take the average of 10 values and report nearest to 0.01 mm. Similarly, test filament thickness at five points each in machine and transverse direction and take the average of 10 values and report nearest to 0.01 mm

B-4 METHOD OF TEST FOR NET DIMENSIONS

Lay each extruded bird protection net flat on a Table. Render it free from bow and warping and measures the width and length nearest to 1 mm.

ANNEX C

[*Table* 1, *Sl No.* (viii) *and* (ix)]

UV RESISTANCE TEST

C-1 TEST SPECIMENS

The test specimens for breaking strength shall be cut from the sample as specified in IS 5815 (Part 5).

C-2 TEST CONDITIONS

C-2.1 The test shall be carried out with fluorescent UV-B lamp (313 nanometer or its equivalent).

C-2.2 The duration of the test shall be 144 h (that is 6 days).

C-2.3 The test cycle shall be 8 h at 60 °C ± 3 °C with UV radiation alternating after 4 h at 50 °C ± 3 °C with condensation.

C-2.4 Irradiation level throughout the test shall be maintained at $63 \begin{smallmatrix} + 0.03 \\ - 0 \end{smallmatrix}$ W/m^2

C-3 TEST PROCEDURE

C-3.1 Determine the original average breaking strength of bird protection nets specimens separately as per the test specified in IS 5815 (Part 5).

C-3.2 Expose the specimens alternately to ultraviolet light alone and to condensation in one respective cycle.

C-3.2.1 The type of fluorescent UV lamp, the timing of the UV exposure and the temperature of condensation shall be as specified in **C-2**.

C-3.3 Determine the average breaking strength of the specimens separately after UV exposure as mentioned above.

C-3.4 Determine the percent retention of original strength as follows:

Percent retention of original breaking strength =

$$\frac{b}{a} \times 100$$

where

b = average breaking strength after UV exposure as obtained in **C-3.3**; and

a = average breaking strength before UV exposure as obtained in **C-3.1**.

NOTES

1 The UV source is an array of fluorescent lamps (with lamp emission concentrated in the UV range).

2 Condensation is produced by exposing the test surface to a heated, saturated mixture of air and water vapour, while the reverse side of the test specimen is exposed to the cooling influence of ambient room air.

ANNEX D
(*Foreword*)

COMMITTEE COMPOSITION

Technical Textiles for Agrotech Applications Sectional Committee, TXD 35

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices:		*Telephones*
Central	: 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002	2323 7617
Eastern	: 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091	2367 0012 2320 9474
Northern	: Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019	265 9930
Southern	: C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113	2254 1442 2254 1216
Western	: Plot No. E-9, Road No.-8, MIDC, Andheri (East), Mumbai 400093	2821 8093

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