भारतीय मानक
Indian Standard

IS 15869 : 2020

वस्त्रादि — ओपन वीव नारियल जटा भूवस्त्र — विशिष्टि

(पहला पुनरीक्षण)

Textiles — Open Weave Coir Bhoovastra — Specification

(First Revision)

ICS 59.080.70

भारतीय मानक ब्यूरो
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FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Geosynthetics Sectional Committee had been approved by the Textile Division Council.

This standard was first published in the year 2008 and has now been revised to incorporate the following major developments:

a) Additional requirements for Ecomark have been specified.

b) Amendment No. 1 has been incorporated.

c) References of the Indian Standards have been updated.

d) BIS certification marking clause has been updated.

Open Weave Coir *Bhoovastra* (CBV) are permeable coir fabrics made from coir fibre extracted from coconut husk either by natural retting or by mechanical process. The open weave CBV are used for stabilization of soil through vegetation against erosion of landscape and soil slopes as well as protection of river bank, canal bank, road and railway embankment and reinforcement of mud wall of stream against erosion and other applications involving separation and filtration.

Open weave CBV control the soil erosion by acting as a ground cover or mulch. As a ground cover, it reduces the flow velocity of run-off water by forming check dams with the help of net structured strands of open weave CBV in firm contact with the soil, which absorb the impact of water flow and resist washing down keeping the soil intact. Open weave CBV also provides support to the seeds sown and seedling, which could be otherwise easily washed away by water. The strands of the net reduce the wind velocity at the soil surface thereby trap soil particles from being blown away. As mulch, open weave CBV provide ideal environment for the seeds to germinate and healthy growth of seedling by regulation of soil humidity, temperature and manure and controlling weeds, by protection from direct sunlight and rain.

Open weave CBV are good insulators, resistant to dampness and moths, bio-degradable, absorb moisture equal to their own weight and conserve moisture in soil which is sufficient for the growth of vegetation. When the open weave CBV eventually disintegrates, it leaves only humus. There is no need for post-installation work.

Open weave CBV have been found to be ideal geo textiles for situations where land is sloppy which may lead to rilling and gullying. In such slopes, heavy rainfall causes loss of soil. In the areas of scanty rainfall where soil is non-cohesive and subject to wind blowing, open weave CBV provide protection against erosion like in cut slopes of railways, roads, approaches of bridges, canal and drainage bank, bank of river, ponds, lakes, hill slopes and terraces requiring surface stabilization, reclamation of mine spoil heaps and sand dune stabilization.

The open weave CBV initially hold the ground for seeds and seedling and provide a mechanical support against water action, help the germination of seeds for better growth of the plants conserving moisture and add organic matter in the soil after degradation. In areas where vegetation is poor or takes longer time for establishment, open weave CBV can hold the soil together for a longer period of time.

The Ministry of Environment and Forests, Government of India has instituted a scheme for labelling environment friendly products known as 'Ecomark scheme'. This standard is based on the criteria as notified by the Government of India *vide* Gazette Notification No. 893(E), dated 18 September 2018 for labelling coir and coir products as environment friendly.

The Ecomark scheme is being operated by the Bureau of Indian Standards. However, to obtain the licence to use the Ecomark on a product, it is also essential to obtain BIS licence to use the Standard Mark as per the relevant Indian Standard for that product.

Plants and grass for soil conservation is given in Annex B for information only.

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

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

TEXTILES — OPEN WEAVE COIR BHOOVASTRA — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes constructional details and other requirements of open weave coir *bhoovastra* (CBV) of three different grades, used in prevention of erosion of soil and, reinforcement of paved and unpaved roads.

2 REFERENCES

The standards listed in Annex A 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.

3 TERMINOLOGY

For the purpose of this standard the definitions as given in IS 12503 (Parts 1 to 6) along with the following shall apply.

3.1 Open Weave CBV — Woven fabric of two treadle weave in construction made from coir yarn in which the warp and weft strands are positioned at a distance to get a mesh (net) effect of 1”, 3/4” and 1/2” square is termed as open weave CBV.

3.2 Mulch — Mulch refer to any material that would be decomposed fully or partially over a period of time and serving as a nutrient to the vegetation that is being nurtured. The mulch has a short-term role to play and not a long-term role in soil stabilization.

4 GRADES

The open weave CBV shall have the following grades based on the mass:

a) *Grade I* — Having mass of 400 g/m^2;
b) *Grade II* — Having mass of 700 g/m^2; and
c) *Grade III* — Having mass of 900 g/m^2.

5 REQUIREMENTS

The CBV shall conform to the constructional and other requirements as given in Table 1.

6 ADDITIONAL REQUIREMENTS FOR ECOMARK (OPTIONAL)

6.1 The product(s) shall meet the requirement specified in this Indian Standard.

6.2 The manufacturer shall produce the consent clearance as per the provisions of *Water (Prevention and Control of Pollution) Act,* 1974 and *Air (Prevention and Control of Pollution) Act,* 1981 and the authorization(s), if required under the rules notified under the *Environment (Protection) Act*, 1986 and the rules made there under while applying for the Ecomark as per *Bureau of Indian Standards Act*, 2016.

6.3 The product(s) or product packaging(s) may display in brief the criteria based on which the product(s) has/ have been labeled environment friendly.

6.4 The material used for product packaging(s) shall be recyclable, reusable or biodegradable.

6.5 The product(s) shall meet the specific requirements as given in Table 2.

7 PACKING

The product(s) shall be suitably packed, as agreed to between the buyer and the seller.

8 MARKING

8.1 Unless otherwise agreed to between the buyer and the seller, the rolls shall be marked with an indelible ink with the following information:

a) Roll no.;
b) Grade;
c) Length, in m;
d) Indication of the source of manufacture;
e) Month and year of packing;
f) Gross mass;
g) Number of pieces packed in the package;
h) Criteria based on which the product(s) has been labeled as Ecomark (optional); and
j) Any other information as required by the law in force.

Table 1 Requirements of Coir *Bhoovastra*

(*Clause* 5)

Sl No.	Characteristic	Grade			Method of Test, Ref to IS
		I	II	III	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Mass per unit area, g/m^2, *Min*	400	700	900	IS 15868 (Parts 1 to 6)
ii)	Width, cm, *Min*	100.0 or as required	100.0 or as required	100.0 or as required	IS 12503 (Parts 1 to 6)
iii)	Length, m	50 or as required	50 or as required	50 or as required	IS 12503 (Parts 1 to 6)
iv)	Thickness at 20 kPa, mm, *Min*	6.5	6.5	6.5	IS 15868 (Parts 1 to 6)
v)	Runnage, m/kg				IS 12503 (Parts 1 to 6)
	a) Ends (warp)	180	150	210	
	b) Picks (weft)	160	160	250	
vi)	Break load, dry (kN/m), *Min*				IS 16635
	a) Machine direction	5.0	8.5	17.0	
	b) Cross machine direction	5.0	8.0	15.0	
vii)	Break load, wet (kN/m), *Min*				IS 16635
	a) Machine direction	3.0	7.0	15.0	
	b) Cross machine direction	3.0	5.0	12.0	
viii)	Peak load, dry (kN/m), *Min*				IS 16635
	a) Machine direction	7.5	9.0	18.5	
	b) Cross machine direction	7.0	8.0	9.0	
ix)	Peak load, wet (kN/m), *Min*				IS 16635
	a) Machine direction	3.5	8.5	16.0	
	b) Cross machine direction	3.5	5.5	13.0	
x)	Trapezoidal tearing strength at 25 mm gauge length, (kN), *Min*				IS 14293
	a) Machine direction	0.18	0.35	0.50	
	b) Cross machine direction	0.15	0.30	0.35	
xi)	Mesh size, mm, *Min*	20.0 × 16.75	7.50 × 7.30	4.2 × 5.1	IS 15868 (Parts 1 to 6)

Table 2 Specific Requirements for Ecomark

(*Clause* 6.5)

Sl No.	Parameters	Requirement	Method of Test
(1)	(2)	(3)	(4)
i)	Residual pesticides (sum parameter) (ppm) (*Max*)	1.0	Annex D of IS 15651
ii)	*p*H of aqueous extract	6-7	Annex H of IS 8391 (Part 1)
iii)	Free and releasable formaldehyde (*Max*)	300 ppm	IS 14563 (Parts 1 and 2)
		(For coloured products only) (total of free and released formaldehyde)	
iv)	Extractable heavy metals by artificial acidic sweat (ppm) (*Max*)		Annex A of IS 15651
	a) Antimony (Sb)	10	
	b) Arsenic (As)	1.0	
	c) Lead (Pb)	1.0	
	d) Cadmium (Cd)	0.1	

Table 2 (*Concluded*)

Sl No.	Parameters	Requirement	Method of Test
(1)	(2)	(3)	(4)
	e) Mercury (Hg)	0.1	
	f) Chromium total (Cr)	2.0	
	g) Cobalt (Co)	4.0	
	h) Copper (Cu)	50.0	
	j) Nickel (Ni)	4.0	
		(For coloured products only)	
v)	Pentachlorophenols (PCP), (ppm) (*Max*)	0.5	Annex B of IS 15651
		(For coloured products only)	
vi)	Banned aryl amines from azo dyes, (ppm) (*Max*)	30.0	IS 15570
		(For coloured products only)	

8.2 BIS Certification Marking

The coir *bhoovastra* rolls 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 coir *bhoovastra* rolls may be marked with the Standard Mark.

9 SAMPLING AND CRITERIA FOR CONFORMITY

9.1 Lot

The quantity of open weave CBV of same grade and width delivered to a buyer against one dispatch note shall constitute a lot.

9.2 Sampling Procedure

For assessing the conformity of a lot to the requirements of this standard, the number of rolls to be selected from the lot shall be in accordance with Table 3.

Table 3 Selection of Rolls for Testing

(*Clauses* 9.2 *and* 9.2.1)

Sl No.	No. of Rolls in the Lot	No. of Rolls to be Selected
(1)	(2)	(3)
(i)	1-20	1
(ii)	21-50	2
(iii)	51-100	3
(iv)	101-200	4
(v)	201 and above	4+1 for every 100 rolls or part thereof above 200 rolls

9.2.1 From the rolls selected as per Table 3, the test sample drawn shall be in accordance with Table 4.

Table 4 Selection of Test Sample

(*Clause* 9.2.1)

Sl No.	Test	Test Sample
(1)	(2)	(3)
i)	Runnage, ends and picks	3 specimens from different locations per selected roll
ii)	Width	
iii)	Thickness	
iv)	Break load and peak load	
v)	Length	One specimen from roll selected
vi)	Mass	
vii)	Mesh size	
viii)	Trapezoidal tearing strength	

9.3 Criteria for Conformity

9.3.1 The lot shall be considered as conforming to the requirements of the standard if, the following conditions are satisfied:

a) Average machine direction and cross machine direction breaking load values for break load, peak load and trapezoidal tear strength are not less than the corresponding specified requirements.

b) Average mass/m^2 (on roll mass basis) and the average runnage (ends and picks) are in accordance with the requirements specified.

c) Average width, length, thickness and mesh size of the rolls under test is in accordance with the requirements specified.

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
8391 (Part 1) : 2019	Rubberized coir sheets for cushioning — Specification: Part 1 Curled (*third revision*)
12503 (Part 1 to 6) : 1988	Coir mattings, mourzouks and carpets — General
14293 : 1995	Geotextiles — Method of test for trapezoid tear strength
14563	Textiles — Determination of formaldehyde
(Part 1) : 1998	Part 1 Free formaldehyde
(Part 2) : 1999	Part 2 Released formaldehyde
15651 : 2006	Textiles — Requirements for environmental labelling
15570 : 2005	Textiles — Method of test — Detection of banned Azo colorants in coloured textiles
15868 (Part 1 to 6) : 2008	Natural fibre geotextiles (Jute geotextiles and coir) *bhoovastra* — Methods of test
16635 : 2017	Geosynthetics — Wide-width tensile test

ANNEX B

(*Foreword*)

(*Informative*)

PLANTS AND GRASS FOR SOIL CONSERVATION

Sl No.	**Botanical Name**	**Suited for**
(i)	*Avicennia officinalis*	Shrub suitable for marshy places
(ii)	*Rhizophora mucronata*	- do -
(iii)	*Cyperus exaltatus*	Grass suitable for highway slopes
(iv)	*Acrostichum aureum*	Shrub suitable for dam sites
(v)	*Adiantum species*	- do -
(vi)	*Cynodon dactylon*	For light sandy soils
(vii)	*Cenchrus ciliaris*	For most types of soil
(viii)	*Eragrostis curvula*	For protecting terraces and channels
(ix)	*Dianthus annulatum*	Sandy light soil
(x)	*Pennisetum pedicellatum*	Sandy loam soil
(xi)	*Bothriochloa glabra*	For red semi-arid soil
(xii)	*Stylosanthes gracilis*	For light soils with low moisture

ANNEX C

(*Foreword*)

COMMITTEE COMPOSITION

Geosynthetics Sectional Committee, TXD 30

Organization	*Representative(s)*
The South India Textile Research Association Council, Coimbatore	Dr A. N. Desai (***Chairman***)
Ahmedabad Textile Industry's Research Association, Ahmedabad	Shrimati Deepali Plawat Shri Jigar Dave (*Alternate*)
Best Geotechnique Pvt Ltd, Mumbai	Shri Satish Naik
Central Coir Research Institute, Alappuzha	Dr D. Anita Ravindranath Shrimati Sumy Sebastian (*Alternate*)
Central Road Research Institute, New Delhi	Shri Sudhir Mathur Shri Jai Bahagwan (*Alternate*)
Central Soil and Materials Research Station, New Delhi	Dr R. Chitra Shri Manish Gupta (*Alternate*)
Charankattu Coir Mfg Co (P) Ltd, Kerala	Shri C. R. Devraj Shri C. D. Athul Raj (*Alternate*)
Central Water Commission, New Delhi	Representative
Department of Jute and Fibre Technology, Kolkata	Dr Swapan Ghosh Prof (Dr) A. K. Samantha (*Alternate*)
DKTE Centre of Excellence in Nonwovens, Ichalkaranji	Shri Aniket S. Bhute
Ganga Flood Control Commission, Patna	Shri A. K. Sinha Shri Manoj Kumar (*Alternate*)
Garware Wall Ropes Ltd, Pune	Shri Tirumal Kulkarni Shri Rajendra Ghadge (*Alternate*)
Geosynthetics Testing Services Pvt Ltd, Ahmedabad	Dr Deepak Manjunath
ICAR- National Institute of Natural Fibre Engineering & Technology, Kolkata	Shri Manik Bhowmick Dr Sanjoy Debnath (*Alternate*)
Indian Institute of Technology, Gandhinagar	Prof Amit Prashant
Indian Institute of Technology, Delhi	Prof A. K. Ghosh
Indian Jute Industries' Research Association, Kolkata	Dr Mahuya Ghosh Shri Koushik Das (*Alternate*)
Indian Jute Mills Association, Kolkatta	Shri S. K. Chandra Shri J. K. Behera (*Alternate*)
Indian Technical Textile Association, Mumbai	Dr Anup Rakshit Shrimati Ruchita Gupta (*Alternate*)
International Geosynthetics Society, India Chapter, New Delhi	Representative
Kusumgar Corporates, Mumbai	Shri Y. K. Kusumgar Dr M. K. Talukdar (*Alternate*)

Organization	*Representative(s)*
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Megaplast India Pvt Ltd, Daman	Shri C. V. Rajesh Shri Hemendra Behera (*Alternate*)
Ministry of Road Transport & Highways, New Delhi	Shri Sanjiv Kumar
Municipal Corporation of Greater Mumbai, Thane	Dr Vishal Ramesh Thombare Shri Mandar Bhalchandra Pingle (*Alternate*)
National Highways Authority of India, Ghaziabad	Shri Rakesh Prakash Singh Shri Mudit Garg (*Alternate*)
National Jute Board, Kolkatta	Shri P. K. Choudhury Shri M. Dutta (*Alternate*)
Office of the Jute Commissioner, Kolkatta	Shri R. K. Roy Shri Soumyadipta Datta (*Alternate*)
Office of the Textile Commissioner, Mumbai	Shri Ajay Pandit Shri Sanjay Charak (*Alternate*)
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Reliance Industries Ltd, New Delhi	Shri Mahesh Sharma Shri V. Ravikanth (*Alternate*)
Strata Geosystems (I) Pvt Ltd, Mumbai	Shri Narendra Dalmia Shri Shahrokh Bagli (*Alternate*)
Techfab India, Mumbai	Shri Anant Kanoi Shri Saurabh Vyas (*Alternate*)
Texel Industries Limited, Gandhinagar	Shri Shailesh R. Mehta Shri Naresh R Mehta (Alternative)
The Bombay Textile Research Association, Mumbai	Shri V. K. Patil Dranjan K. Mukhopadhyay (*Alternate*)
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BIS Directorate General	Shri A. K. Bera, Scientist 'F' and Head (TXD) [Representing Director General (*Ex-officio*)]

Member Secretary

Shri J. K. Gupta

Scientist 'D' (TXD), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

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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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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