
यांत्रिक रूप से निष्काशित नारियल रेशे की
विशिष्टि

भाग 3 निर्वल्क नारियल रेशे

(दूसरा पुनरीक्षण)

Specification for Mechanically
Extracted Coir Fibres

Part 3 Decorticated Coir Fibre

(Second Revision)

ICS 59.060.01

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August 2020

Price Group 4

FOREWORD

This Indian Standard (Part 3) (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Coir and Coir Products Sectional Committee had been approved by the Textile Division Council.

This standard was first published in March 1987 in 3 parts and further revised in September 1987. Further it has now been revised to incorporate the following changes by splitting up 3 parts as separate standard:

Additional requirements for Ecomark (optional) have been incorporated; and Amendment no. 1 has been incorporated.

This Indian Standard is published in three parts. The other parts in this series are:

Part 1 Bristle coir fibres

Part 2 Mattress coir fibres

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.

The composition of the committee responsible for the formulation of this standard is given at Annex F.

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

SPECIFICATION FOR MECHANICALLY EXTRACTED COIR FIBRES

PART 3 DECORTICATED COIR FIBRE

(Second Revision)

1 SCOPE

This standard (Part 3) prescribes the requirements and methods of tests for two grades of mechanically extracted decorticated coir fibre designated as, Grade 1 and Grade 2.

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 the standards indicated in Annex A.

3 TERMINOLOGY

For the purpose of this standard, the following definition shall apply:

3.1 Decorticated Fibre — The mixed fibre mechanically extracted from the husks of matured and ripe coconut.

4 LENGTH OF FIBRE

Based on the lengths the fibre shall be grouped as follows:

<i>Group</i>	<i>Length</i> mm
Long fibres	Above 150
Medium fibres	Above 100 and up to 150
Short fibres	Above 50 and up to 100

5 REQUIREMENTS

5.1 Texture

The grade 1 decorticated fibres shall be strong and springy. The grade 2 fibres shall be softer than grade 1, but harder and more springy than mattress fibres and both shall not be brittle.

5.2 Mass

The percent by mass of 'long', 'medium' and 'short' fibres in two grades of decorticated coir fibres shall be as agreed to between the purchaser and the supplier. Where no such agreements exist, the proportion by mass of 'long', 'medium' and 'short' fibres in two grades of decorticated coir fibres shall be in accordance with the requirements of Table 1. The percent by mass of the fibres shall be determined by the method prescribed in Annex B.

5.3 Impurities

The maximum permissible impurities, chiefly pith, cluster and dust in decorticated coir fibres shall be in accordance with Table 1. The percentage of impurities in a consignment shall be determined by the method described in Annex C.

Table 1 Percent by Mass of Long, Medium and Short Fibres and Impurities
(Clauses 5.2 and 5.3)

Grade	Long Fibres	Medium/ Short Fibres	Short Fibres	Impurities
	<i>Min</i>	<i>Max</i>	<i>Max</i>	<i>Max</i>
(1)	(2)	(3)	(4)	(5)
Grade 1	20	80	25	7
Grade 2	20	80	30	12

5.4 Moisture Content

The moisture content of decorticated coir fibres shall not exceed 15 percent, when determined by the method prescribed in Annex D.

5.5 Chloride Content

The chloride content of the decorticated coir fibres calculated as Cl, when determined by the method prescribed in Annex E shall not exceed 0.6 percent by mass.

5.6 Sulphate Content

The sulphate content of the decorticated coir fibres, when determined by the method prescribed in IS 4203 shall not exceed 0.25 percent by mass.

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 Ecomarkas 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 shall meet the specific requirements as given in Table 2.

**Table 2 Specific Requirements for Ecomark
(Optional)
(Clause 6.5)**

Sl No.	Parameter	Requirement	Method of Test
(1)	(2)	(3)	(4)
i)	Residual pesticides (sum parameter) (ppm) (Max)	1.0	IS 15651
ii)	pH of aqueous extract	6-7	IS 8391 (Part 1)

7 CORRECT INVOICE MASS

7.1 The correct mass of the lot shall be taken to be equal to the mass determined by adding 18 percent to its oven-dry mass.

7.2 The oven-dry mass of each lot shall be calculated from its net mass and the moisture content of the lot; the latter being determined by the method prescribed in Annex D.

8 PACKING AND MARKING

8.1 Decorticated fibre shall be suitably packed in bales or as agreed to between the purchaser and the supplier.

8.2 A label giving the following particulars shall be marked on each bale nor package:

- Manufacturer's name, initials or trade-mark;
- Name of the material;
- Net mass of bale;
- Grade number;
- Month and year of manufacture;
- Criteria for which coir fibre has been labeled as Ecomark; and
- Any other information required by the buyer or by the law in force.

8.3 BIS Certification Marking

The product(s) 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 products may be marked with the Standard Mark.

9 SAMPLING AND CRITERIA FOR CONFORMITY

9.1 Sampling

9.1.1 Lot

The bales of coir fibre of the same type and grade, delivered to one buyer against one despatch note shall constitute a lot.

9.1.2 The conformity of a lot to the requirements of this standard shall be determined on the basis of the tests carried out on the bales selected from it.

9.1.3 Unless otherwise agreed to between the buyer and the seller, the number of bales to be selected from the lot shall be in accordance with column 2 of Table 3.

9.1.3.1 The bales shall be selected at random. In order to ensure randomness of selection, all the bales in the lot may be serially numbered as 1, 2, 3 . . . and so on and every r^{th} bale may be selected until the requisite number obtained, r being the integral part of N/n , where N is the lot size and n is the sample size.

9.1.4 For evaluating:

- percent by mass of long, medium and short fibre;
- impurities;
- texture;
- chloride content; and
- sulphate content requirements, about 1 kg of the coir fibre shall be selected from 20 different randomly distributed places in the bale by taking about 50 g of the fibre from each place, The quantity drawn from each bale shall be kept separately.

Table 3 Number of Bales to be Selected
(Clause 9.1.3)

Lot Size <i>N</i> (1)	Sample Size <i>n</i> (2)
Up to 50	3
51 to 100	5
101 to 200	6
201 to 300	7
301 to 500	8
501 to 800	9
801 and above	10

9.1.4.1 For evaluating moisture content, about 500 g of the coir fibre shall be collected from 10 different randomly distributed places in the bale by taking 50 g of the fibre from each place. The quantity so drawn

from each place shall be immediately transferred to a suitable air-tight container and the container sealed to avoid any loss of moisture.

9.1.5 Criteria for Conformity

The lot shall be considered in conformity with the requirements of the standard, if the following conditions are satisfied:

The percent by mass of long, medium and short fibres, impurities and texture shall satisfy the requirements as specified in **5.1**, **5.2** and **5.3** respectively.

From the observed values of moisture-content, chloride content and sulphate content, the average (\bar{X}) and the range (R) are calculated and the expression $\bar{X} + 0.4 R$ is less than or equal to the values specified in **5.4**, **5.5** and **5.6**.

NOTES:

1 The average (\bar{X}) is the value obtained by dividing the sum of the observed values by the number of tests.

2 The range R is the difference between the maximum and the minimum in a set of observed values.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
4203 : 1967	Method for determination of sulphate content in textile materials	15651 : 2006	Textiles — Requirements for environmental labelling — Specification
6359 : 1971	Method for conditioning of textiles	8391 (Part 1) : 2018	Rubberized coir sheets for cushioning — Specification: Part 1 Curled
1070 : 1992	Reagent grade water		

ANNEX B

(Clause 5.3)

METHOD FOR DETERMINATION OF THE PERCENT BY MASS OF LONG, MEDIUM AND SHORT FIBRES**B-1 TEST SPECIMENS**

Draw 3 test specimens weighing approximately 2 g each from the test sample (*see* 9.1.4).

given below:

B-2 EQUIPMENT

For the purpose of this test, a flat table marked with a scale with 10 mm graduations shall be used.

**Length of the Fibre
mm****Group**

Above 150

Long fibres

Above 100 and up to 150

Medium fibres

Above 50 and up to 100

Short fibres

B-3 PROCEDURE

B-3.1 Take one of the test specimens and measure the length of its individual fibres on the scale marked on the table by holding one end of each fibre with the forefinger of the one hand and stretching the other end with the fingers of the other hand. Arrange the fibres so measured into three groups according to their length as

B-3.2 Weigh the fibres in each group and calculate the percentage of the mass of fibres in each group to the total mass of fibres in all the three groups.

B-3.3 Repeat the test with the remaining two test specimens.

B-3.4 Average of the percentage by mass, of fibres in respective groups shall be deemed to be the percent by mass of long, medium and short in the consignment.

ANNEX C

(Clause 5.4)

METHOD FOR DETERMINATION OF THE PERCENTAGE OF
IMPURITIES IN BRISTLE FIBRE

C-1 TEST SPECIMENS

Draw 5 test specimens weighing approximately 60 g each from the test sample (see 9.1.4).

C-2 PROCEDURE

C-2.1 Dry one of the test specimens in a conditioning oven (**D-1.1**). Determine its oven-dry mass correct to the nearest 0.05 g.

C-2.2 Immediately after drying, remove all pith, dust and other impurities adhering to the fibre and determine the oven-dry mass of the cleaned test specimen correct to the nearest 0.05 g.

C-2.3 Calculate the percentage of impurities in the test specimen by the following formula:

$$\text{Impurities, percent by mass} = \frac{(m_1 - m_2)}{m_1} \times 100$$

where,

m_1 = Oven-dry mass of the test specimen before cleaning, and

m_2 = Oven-dry mass of the test specimen after cleaning.

C-2.4 Repeat the test with the remaining test specimens. The average of all the values thus obtained shall be deemed to be the percentage of impurities in the bristle fibre consignment.

ANNEX D

(Clauses 5.5 and 7.2)

METHOD FOR DETERMINATION OF MOISTURE CONTENT IN BRISTLE FIBRE

D-1 APPARATUS

D-1.1 Conditioning Oven

With forced ventilation, provided with positive valve control and capable of maintaining a temperature of 100 to 110°C, equipped with a weighing balance arranged to weigh bristle fibre with an accuracy of 0.5 g while suspended within the drying chamber, the holder of the fibre to be of such a type as to ensure free access of the dry air to all portions of the fibre.

D-2 PROCEDURE

D-2.1 Remove about 500 g of coir fibre from the test sample (see 9.1.4.1) and weigh it correct to the nearest 0.5 g. Place the test specimen in the conditioning oven and dry for one hour and weigh to the nearest 0.5 g. Dry for another 15 min and weigh to the nearest 0.5 g.

Provided the loss in mass in drying of the test specimen, as disclosed by the first and second weighings, does not exceed 0.25 percent of the first mass, take the second mass to be the dry mass of the test specimen. If the loss exceeds 0.25 percent, weigh the test specimen at 15 min intervals till the loss between two successive weighings is 0.25 percent or less.

D-2.2 Calculate the percentage of moisture content by the following formula:

$$\text{Moisture content, percent by mass} = \frac{(m_1 - m_2)}{m_1} \times 100$$

Where,

m_1 = Mass of the original test specimen, and

m_2 = Mass of the oven-dried test specimen.

ANNEX E

(Clause 5.6)

METHOD FOR DETERMINATION OF CHLORIDE CONTENT OF COIR FIBRE

E-1 PRINCIPLE

The aqueous extract of the coir fibre is prepared and then the chloride content is determined volumetrically by titration with standard silver nitrate solution using potassium chromate solution as indicator and expressed as percentage by mass of the material taken.

E-2 TEST SPECIMEN

Draw at least two test specimens each weighing about 10 g from the test sample (*see* 9.1.4). Cut the test specimens into small pieces.

E-3 CONDITIONING OF TEST SPECIMEN

Prior to test, the test specimens shall be conditioned for 24 h to attain moisture equilibrium in a standard atmosphere at 65 ± 2 percent relative humidity and $27 \pm 2^\circ\text{C}$ temperature (*see* IS 6359).

E-4 PREPARATION OF AQUEOUS EXTRACT

E-4.1 Procedure

Weigh the test specimen and transfer to a clean, chemically resistant glass flask, fitted with ground glass joint for reflux condenser. Add distilled water (*see* IS 1070) weighing 20 times the mass of the coir fibre taken for the test to the flask. Fit the flask to the reflux condenser and heat the contents of the flask to boil. Continue boiling for 1 h. Remove the flask and close while the liquid is still boiling gently using a clean ground glass stopper. Cool to room temperature.

E-5 DETERMINATION OF CHLORIDE CONTENT

E-5.1 Reagents

E-5.1.1 Calcium Carbonate (Chloride Free)

E-5.1.2 Standard Silver Nitrate Solution, 0.1 N.

E-5.1.3 Potassium Chromate Solution

Prepared by dissolving 50 g of potassium chromate in about 250 ml distilled water. Add silver nitrate solution till a distinct red precipitate is formed. Allow to stand overnight and filter. Dilute the filtrate to 1 litre with distilled water.

E-5.2 Procedure

Take a suitable measured portion of the aqueous extract as prepared in E-4.1. Neutralize with calcium carbonate till a pale yellow colour is obtained (usually 0.5 g is sufficient). Add 1 ml of potassium chromate indicator solution and titrate with standard silver nitrate solution, till a red colour is obtained.

E-5.3 Calculation

$$\text{Chloride (as Cl) percent by mass} = \frac{3.546(V_1 - V_2)N}{M}$$

Where,

V_1 = Volume in ml, of standard silver nitrate solution used in the titration with the material,

V_2 = Volume in ml, of the standard silver nitrate solution used in the blank determination,

N = Normality of standard silver nitrate solution, and

M = Mass in g, of the material taken for the test.

E-5.3.1 Repeat the test with the remaining test specimen and calculate the percent by mass.

ANNEX F

(Foreword)

COMMITTEE COMPOSITION

Coir and Coir Products Sectional Committee, TXD 25

<i>Organization</i>	<i>Representative(s)</i>
Central Coir Research Institute, Kalavoor	DR ANITA DAS RAVINDRANATH (Chairman) SMT SUMI SEBASTIAN (<i>Alternate</i>)
Coir Pith and Allied Products Manufacturers and Exporters Association, Coimbatore	PRESIDENT SECRETARY (<i>Alternate</i>)
All India Rubberized Coir Products Manufacturers Association, Tirunelveli	SHRI SUNDARESAN SHRI MATHEW GEORGE (<i>Alternate</i>)
Central Institute of Coir Technology, Bengaluru	JOINT DIRECTOR SENIOR SCIENTIFIC OFFICER (<i>Alternate</i>)
Coconut Development Board, Ernakulam	SHRI SUGATA GHOSH DR K. MURALIDHARAN (<i>Alternate</i>)
Coir Board, Kochi	SECRETARY JOINT DIRECTOR (<i>Alternate</i>)
Coir Mats and Mattings Association,	SHRI V. A. JOEPH SHRI PAVITHRAN (<i>Alternate</i>)
Coir on Foam Products, Coimbatore	SHRI HARIRAJAN SHRI PHILIP VARGHESE (<i>Alternate</i>)
Coir Shippers' Council, Cherthala	SHRI K. S. SANJEEV SHRI SAJAN B. NAIR (<i>Alternate</i>)
Federation of Indian Coir Exporters' Associations, Alleppey	SHRI JOSPAUL MATHEW SHRI SAJAN B. NAIR (<i>Alternate</i>)
Hindustan Coir, Coir Board Complex Alappuzha	WEAVING MASTER SENIOR SCIENTIFIC OFFICER (<i>Alternate</i>)
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Kerala Organic Manure and Fertilizer	SHRI G. RAJESH
Kerala State Coir Corporation Ltd, Alappuzha	SHRI G. SREEKUMAR SHRI. N. SUNURAJ (<i>Alternate</i>)
Kerala State Small Scale Coir Manufacturer's Federation, Alappuzha	PRESIDENT SECRETARY (<i>Alternate</i>)
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Natural Green Tech (P) Ltd, Bengaluru	SHRI TOMMY MATHEW SHRI ABHISHEK THOMAS (<i>Alternate</i>)
Orissa Co operative Coir Corporation Ltd, Bhubaneshwar	MANAGING DIRECTOR GENERAL MANAGER (<i>Alternate</i>)

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Venugopal Fibre Industries, Pattukottai	SHRI R. B. SHYAM SUNDER
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Member Secretary

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SCIENTIST 'D' (TXD), BIS

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This Indian Standard has been developed from Doc No.: TXD 25 (15046).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Published by BIS, New Delhi