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IS 15340 (2003): Coir Felt [TXD 25: Coir and Coir Products]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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भारतीय मानक  
कॉयर फ़ैल्ट — विशिष्टि

*Indian Standard*  
COIR FELT — SPECIFICATION

ICS 59.060.10; 59.080.50

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**BUREAU OF INDIAN STANDARDS**  
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NEW DELHI 110002

## FOREWORD

This Indian Standard 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 has been prepared in response to the long felt demand of the coir industry for promoting environment friendly agro-based products.

This standard prescribes two grades of coir felt of seven varieties each according to mass and thickness of the felt.

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

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

## COIR FELT — SPECIFICATION

### 1 SCOPE

This standard specifies the requirements and methods of test for two grades of coir felts having mass ranging from 600 g/m<sup>2</sup> to 1 200 g/m<sup>2</sup>.

### 2 REFERENCES

The standards given below 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 standards given below.

<i>IS No.</i>	<i>Title</i>
1070 : 1977	Reagent grade water ( <i>third revision</i> )
2711 : 1979	Specification for direct reading pH meters ( <i>second revision</i> )
4203 : 1967	Method for determination of sulphate content in textile materials
6359 : 1971	Method for conditioning of textiles
9308 (Parts 1 to 3) : 1987	Specification for mechanically extracted coir fibres ( <i>first revision</i> )

### 3 MANUFACTURE

**3.1** The coir felt is manufactured by needle punching the coir fibre web of required mass and width.

**3.2** Fibre webs of required mass are made by either air lay or gravity lay process.

**3.3** The coir felt shall be as far as possible free from ridges and creases and preferably have straight edges.

**3.4** Unless otherwise specified the raw material used for the manufacture of coir felt shall conform to IS 9308 (Part 3).

**3.5** Coir felt may also be manufactured with jute or HDPE scrim backing or any other material as agreed to between the buyer and the seller.

### 4 GRADE AND VARIETIES

Coir felt shall be of two grades depending upon the impurities and each grade shall be having seven varieties according to mass and thickness.

### 5 REQUIREMENTS

#### 5.1 Impurities

The maximum permissible impurities mainly pith, cluster and dust in coir felt shall be in accordance with Table 1 when determined by the method prescribed in Annex A.

**Table 1 Grades of Coir Felt**  
(Clause 5.1)

SI No.	Grades	Impurities, Percent, <i>Max</i>
(1)	(2)	(3)
i)	Grade 1	5
ii)	Grade 2	7

#### 5.2 Mass per Square Metre and Thickness

The coir felt of different varieties of each grade shall conform to the requirements given in Table 2 when determined by the method prescribed in Annex B.

#### 5.3 Moisture Content

The moisture content of the coir felt shall not exceed 15 percent when determined by the method prescribed in Annex C.

#### 5.4 Chloride Content

The chloride content of the coir felt, when determined by the method prescribed in Annex D shall not exceed 0.6 percent by mass.

#### 5.5 Sulphate Content

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

#### 5.6 pH Value

The pH value of the aqueous extract of the coir felt, when determined by the method prescribed in Annex D shall be between 5 to 8.5.

### 6 PACKING AND MARKING

**6.1** Unless otherwise agreed to between the buyer and the seller, the felts shall be packed as mentioned in **6.2**.

**6.2** The coir felts shall be rolled individually and tied with a coir yarn at two places minimum.

**Table 2 Physical Requirements of Coir Felts***(Clause 5.2)*

SI No.	Variety No.	Mass g/m <sup>2</sup>	Thickness mm	Preferred Length of Felt in Roll m
(1)	(2)	(3)	(4)	(5)
i)	1	600	9	25
ii)	2	700	10	25
iii)	3	800	11	25
iv)	4	900	12	25
v)	5	1 000	13	25
vi)	6	1 100	14	25
vii)	7	1 200	15	25
Tolerance, Percent		± 5	± 5	—

**6.3** Each roll shall bear the following information:

- Manufacturer's name, initials or trade-mark;
- Name of the material;
- Nominal length, width and thickness of the material;
- Grade and variety number;
- Month and year of manufacture; and
- Any other information required by the buyer or by the law in the force.

#### 6.4 BIS Certification Marking

The coir felt may also be marked with the Standard Mark.

**6.4.1** The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and Rules and Regulations made thereunder. The

details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

## 7 SAMPLING

### 7.1 Lot

The quantity of coir felt of the same grade and variety number delivered to a buyer against a despatch note shall constitute a lot.

**7.2** The conformity of the lot to the requirements of this specification shall be determined on the basis of the tests carried out on the sample selected from it.

**7.3** Unless otherwise agreed to between the buyer and the seller, the number of rolls to be selected at random from a lot shall be in accordance with Table 3.

**Table 3 Sample Size and Criteria for Conformity***(Clauses 7.3 and 7.4)*

SI No.	No. of Rolls in the Lot	No. of Rolls to be Selected	Acceptance Number	Sub-Sample Size
(1)	(2)	(3)	(4)	(5)
i)	Up to 100	5	0	2
ii)	101 to 150	8	1	2
iii)	151 to 300	13	1	3
iv)	301 to 500	20	2	3
v)	501 and above	32	3	5

7.4 The number of test samples and the criteria for conformity of a lot for various characteristics shall be as follows:

<i>Characteristics</i>	<i>Number of Test Samples</i>	<i>Criteria of Conformity</i>
Impurities, mass and thickness	According to col 3 of Table 3	Non-confirming rolls shall not exceed the corresponding number given in col 3 of Table 3
Length	According to col 3 of Table 3	None of the pieces shall be less than the declared marked length
Moisture content, chloride content, sulphate content and pH value	According to col 5 of Table 3	All the test samples shall satisfy the relevant requirements

## ANNEX A

(Clause 5.1)

### METHOD FOR DETERMINATION OF PERCENTAGE OF IMPURITIES IN COIR FELT

#### A-1 TEST SPECIMENS

A-1.1 Draw 5 test specimens of 0.5 m × 0.5 m from the test sample.

#### A-2 PROCEDURE

A-2.1 Dry the test specimen in conditioned oven (see C-2.1). Determine its oven dry mass correct to the nearest 0.5 g.

A-2.2 Immediately after drying, remove all pith, dust and other impurities adhering to the felt and determine the oven dry mass of the clean felt correct to the nearest 0.5 g.

A-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.

A-3.4 Repeat the test with the remaining felt specimens. The average of all the values thus obtained shall be deemed to be the percentage of impurities in the felt.



## ANNEX B

(Clause 5.2)

METHOD OF TEST FOR DETERMINATION OF  
MASS PER SQUARE METRE AND THICKNESS**B-1 ATMOSPHERIC CONDITIONS FOR  
CONDITIONING AND TESTING**

**B-1.1** The tests shall be carried out in the standard atmosphere at  $27 \pm 2^\circ\text{C}$  temperature and  $65 \pm 2$  percent relative humidity (see IS 6359).

**B-1.2** Prior to test, the specimens shall be conditioned to moisture equilibrium in the standard atmosphere. When the specimens have been left in such atmosphere for 48 h in such a way as to expose as far as possible all portions of the specimens to the atmosphere, they shall be deemed to have reached moisture equilibrium.

**B-2 THICKNESS**

**B-2.1** Each roll in the test sample selected in accordance with Table 3 shall constitute a test specimen.

**B-2.2** The instrument for measuring the thickness consists of a 250 mm long, rigid, narrow measuring needle made out of the suitable material and finished to give a smooth polished surface, one end of which is fixed vertically to the centre of a polished plate of 3 mm thickness and 50 mm  $\times$  50 mm size, the other end being tapered to a point, to facilitate insertion to the rod through the coir felt sample. The needle is calibrated in millimetre all along its length starting with the point fixing it with the plate as 0, every 5 and 10 mm from this point being prominently marked out. A disc of 35 mm diameter, weighing 200 g with a central hole to facilitate movement of the weight all along the length of the calibrated needle also forms part of the measuring instrument.

**B-2.2.1 Procedure**

For measuring the thickness of the sample, the calibrated needle measuring instrument is inserted through the bottom side of the coir felt, so that the needle

is in a plane perpendicular to the free surface of the coir felt. There upon, the sliding weight is introduced on the projecting part of the needle and the combined thickness of the coir felt and that of the sliding weight read directly, correct to the nearest 1 mm, on the calibrated needle. The thickness of the sliding weight is deducted from this reading to obtain the thickness of the test sample. The measurements are recorded at least at four points at random on the test piece and the average value taken as the thickness of the test material.

**B-3 DETERMINATION OF THE MASS PER  
SQUARE METRE**

**B-3.1** Select the sample of approximate length and width of 0.5 m. Measure the length ( $l$ ) and width ( $w$ ) of the sample using a steel rule nearest to 1 mm, ensuring the measurement along a line perpendicular to opposing faces of the sample. Express the measurements in metre.

**B-3.2** Determine the mass ( $m$ ) of the sample using analytical or electronic weighing balance to the nearest 0.5 g.

**B-3.3** Calculate the mass per square metre by the following formula:

$$\text{Mass per square metre} = \frac{m}{l \times w}$$

where

$m$  = mass of the sample as determined in **B-3.2**, and

$l$  and  $w$  = as determined **B-3.1**.

**B-3.4** Repeat the test with the remaining test specimens. The average of all the values thus obtained shall be deemed to be the mass per square metre of the consignment.

## ANNEX C

(Clause 5.3)

## METHOD FOR DETERMINATION OF MOISTURE CONTENT IN COIR FELT

## C-1 TEST SPECIMEN

Draw 5 test specimens of 0.5 m × 0.5 m from the test sample.

## C-2 APPARATUS

**C-2.1** Conditioning oven-with forced ventilation, provided with positive valve control and capable of maintaining a temperature of 100 °C to 110 °C.

**C-2.2** Weighing balance of either of analytical type or electronic type capable of weighing 500 g with an accuracy of 0.5 g.

## C-3 PROCEDURE

**C-3.1** The test specimen is weighed correct to the nearest 0.5 g. Place the test specimen in the conditioning oven and dry for 1 h 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 specimens at 15 min intervals till the loss between two successive weighings is 0.25 percent or less.

**C-3.2** 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.

**C-3.3** Repeat the test with the remaining felt specimens. The average of all the values thus obtained shall be deemed to be the moisture content.

## ANNEX D

(Clauses 5.4 and 5.6)

## METHOD FOR DETERMINATION OF pH VALUE AND CHLORIDE CONTENT OF COIR FELT

## D-1 PRINCIPLE

The aqueous extract of the coir felt 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.

## D-2 TEST SPECIMEN

Draw at least two test specimens each weighing about 10 g from the test sample.

## D-3 CONDITIONING OF TEST SPECIMEN

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

## D-4 PREPARATION OF AQUEOUS EXTRACT

## D-4.1 Procedure

Weigh the test specimen and transfer it 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.

## D-5 DETERMINATION OF pH VALUE

Transfer a portion of the aqueous extract to the electrode of pH metre (IS 2711) and determine the pH.

## D-6 DETERMINATION OF CHLORIDE CONTENT

## D-6.1 Reagents

**D-6.1.1** Calcium Carbonate (Chloride Free)

**D-6.1.2** Standard Silver Nitrate Solution—0.1 N.

**D-6.1.3** Potassium Chromate Solution—Prepared by

## IS 15340 : 2003

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.

### D-6.2 Procedure

Take a suitable measured portion of the aqueous extract as prepared in D-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.

### D-6.3 Calculation

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

where

$V_1$  = volume, in ml, of standard silver nitrate solution used in the titration with material;

$V_2$  = volume, in ml, of 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.

**D-6.3.1** Repeat the test with the remaining test specimens and calculate the percent by mass.

## ANNEX E

(Foreword)

## COMMITTEE COMPOSITION

Coir and Coir Products Sectional Committee, TX 25

<i>Organization</i>	<i>Representative(s)</i>
Coir Board, Kochi	SHRI CHRISTY FERNANDEZ ( <i>Chairman</i> ) SHRI P. T. JOSEPH ( <i>Alternate I</i> ) SHRI M. KUMARASWAMY PILLAI ( <i>Alternate II</i> )
All India Rubberized-Coir Products Manufacturers' Association, Bangalore	SHRI S. SUNDARESAN SHRI P. CHANDY MATHEW ( <i>Alternate</i> )
Central Coir Research Institute, Kalavoor	DR U. S. SARMA SHRI V. RADHAKRISHNAN NAIR ( <i>Alternate</i> )
Coir Shippers' Council Sherattally, Kerala	SHRI C. R. DEVRAJ
Department of Industries & Commerce, Government of Karnataka	SHRI M. SUGNANA MURTHY
Directorate of Industries & Commerce, Government of Kerala, Thiruvananthapuram	SHRI N. VIMLAN
Directorate General of Supplies & Disposals (Inspection Wing), New Delhi	SHRI A. K. SEHGAL SHRI SAMIRON ROY ( <i>Alternate</i> )
Export Inspection Council of India, New Delhi	SHRI P. P. SAXENA
Indian Rope Manufacturers' Association, Kolkata	SHRI N. K. SOMANI
Indian Coir Association, Kochi	SHRI N. C. J. JOHN SHRI MATHEW JOSEPH ( <i>Alternate</i> )
Karnataka State Coir Development Corporation Ltd, Bangalore	REPRESENTATIVE
Ministry of Defence (DGQA), New Delhi	SHRI N. S. SENGAR SHRI M. H. BASAV RAJ ( <i>Alternate</i> )
Rubber Board, Kottayam	DR E. V. THOMAS
The Cochin Chamber of Commerce & Industry, Kochi	SHRI MATHEW JOSEPH
The Tamilnadu State Coir and Curled Coir Manufacturers' Association, Pollachi	SHRI C. M. KAMARAJ
The Travancore Coir Mats and Matting Manufacturers' Association, Alleppey	SHRI GEORGE VERGHES SHRI THOMAS T. JOSEPH ( <i>Alternate</i> )
BIS Directorate General	SHRI P. BHATNAGAR, Director & Head (TXD) [Representing Director General ( <i>Ex-officio</i> )]
 <i>Member Secretary</i> SHRI ARUN SINGH Joint Director (TXD), BIS	

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### Amendments Issued Since Publication

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