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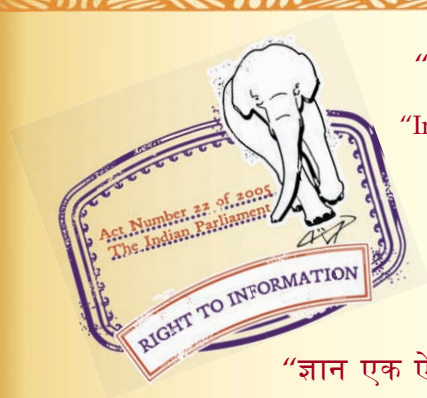
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IS 14596 (1998): Coir Products - 2 ply coir yarns spun by manual operation (Superseding IS 2295) [TXD 25: Coir and Coir Products]



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**भारतीय मानक**

**नारियल जटा उत्पाद — प्रचालन संहिता द्वारा कते हुए  
नारियल जटा के दो-प्लाई धागे — विशिष्टि**

*Indian Standard*

**COIR PRODUCTS — 2-PLY COIR YARNS SPUN BY  
MANUAL OPERATION — SPECIFICATION**

ICS 59.060.01

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
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.

Formulation of Indian Standard on the subject which was taken up at the request of Coir Board would provide the much needed assurance of quality of coir yarn used in manufacture of other coir products. In this standard attempt has been made to stipulate the norms in respect of linear density (runnage), turns per metre, breaking load, moisture content, salt and sand content in addition to requirements of colour and feel hitherto specified. In order to cover complete range of 2-ply coir yarns in one standard, it supersedes IS 2295 : 1964 'Superior ANJENGO type yarn'.

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 PRODUCTS — 2-PLY COIR YARNS SPUN BY MANUAL OPERATION — SPECIFICATION

### 1 SCOPE

This standard covers requirements and methods of tests for 2-ply coir yarns spun by manual operation, namely, Anjengo yarn, Anjengo M. yarn, Aratory yarn, Alappat yarn, Ashtamudy yarn, Beach yarn, Beypore yarn, Parur yarn, Quilandy yarn, Roping yarn and Vycome yarn.

### 2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

<i>IS No.</i>	<i>Title</i>
832 : 1985	Methods for determination of twist in yarn ( <i>first revision</i> )
1070 : 1992	Reagent grade water ( <i>third revision</i> )
1670 : 1991	Textiles — Yarn — Determination of breaking load and elongation at break of single strand ( <i>second revision</i> )
6359 : 1971	Method for conditioning textiles

### 3 TERMINOLOGY

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

#### 3.1 Anjengo Yarn

Wheel spun 2-ply yarn, hard twisted and uniform textured, made out of long stapled and well cleaned white coir fibre of natural bright colour, usually spun in 11 to 20 score.

#### 3.2 Anjengo M. Yarn

Wheel spun 2-ply yarn, very hard twisted and uniform textured, made out of long stapled and well cleaned white coir fibre of natural bright colour, usually spun in 10 to 15 score.

#### 3.3 Aratory Yarn

Wheel spun 2-ply yarn with medium twisted single strand and hard twisted in doubling fairly uniform in thickness, having hairiness made out of long or medium stapled white fibre of light natural colour, usually spun in 11 to 18 score.

#### 3.4 Alappat Yarn

Wheel or hand spun 2-ply yarn medium twisted, made out of white coir fibre varying in colour from bright

natural light brown to grey usually spun in 11 to 15 score.

#### 3.5 Ashtamudy Yarn

Wheel spun 2-ply yarn, medium twisted made out of medium and short stapled white coir fibre of light brown to grey in colour, usually spun in 8 to 13 score.

#### 3.6 Beach Yarn

Wheel or hand spun, soft twisted 2-ply yarn made out of white or brown coir fibre, natural reddish-brown in colour containing remnants of pith, usually spun in 11 to 14 score.

#### 3.7 Beypore Yarn

Wheel or hand spun, soft twisted 2-ply yarn, made out of white coir fibre, natural brown to light grey in colour, usually spun in 6 to 9 score.

#### 3.8 Parur Yarn

Wheel spun 2-ply yarn very hard twisted and uniform textured made out of long or medium stapled well cleaned white coir fibre of light brown in colour, usually spun in 6 to 12 score.

#### 3.9 Quilandy Yarn

Wheel or hand spun medium twisted 2-ply yarn made out of long or medium stapled white coir fibre natural light brown to grey in colour, usually spun in 8 to 12 score.

#### 3.10 Roping Yarn

Hand spun 2-ply yarn soft twisted made out of medium or short stapled white coir fibre of brown to grey in colour, containing remnants of pith, usually spun in 4 to 6 score.

#### 3.11 Vycome Yarn

Wheel or hand spun 2-ply yarn soft or medium twisted made out of white coir fibre of natural brown to grey, usually spun in 11 to 17 score.

#### 3.12 Scorage of Yarn

A number indicating the fineness or coarseness of coir yarn which is obtained by dividing the number of strands that could be laid very close to each other without overlapping in a length of 0.914 m (or one yard) by 20.

### 3.13 Runnage of Yarn

Length of yarn in metres per kg or feet per pound.

## 4 TYPES AND GRADES

The coir yarn shall be classified into types and grades as given in col 1 and 2 of Table 1.

## 5 REQUIREMENTS

### 5.1 Colour

The yarn shall be supplied in any of the natural colours as specified in contract/order. All bales of yarn in a consignment shall be of uniform colour without streaks or shade variation. For the purpose of comparing the colour, sample sealed by mutual agreement may be used.

### 5.2 Salt Content

The salt content of yarn expressed as sodium chloride, shall not exceed 5.5 percent on the weight of conditioned yarn, when tested by the method prescribed in Annex B.

### 5.3 Moisture Content

The moisture content of yarn when tested by the method prescribed in Annex C shall not exceed 15.0 percent on the mass (of yarn) determined in standard atmosphere.

### 5.4 Sand Content

The sand content of yarn when tested by the method given in Annex D shall not exceed 2.0 percent.

### 5.5 Construction and Other Requirements

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

## 6 CORRECTED INVOICE MASS

6.1 The corrected invoice mass of the lot shall be taken

to be equal to the mass determined by adding 17.5 percent to its oven-dry mass.

6.2 The oven-dry mass of each bale shall be calculated from its net mass, and the moisture content of the lot; the latter being determined as prescribed in Annex C.

$$\text{NOTE — Oven-dry mass} = W_1 \frac{W_1 R}{100}$$

where

$W_1$  = net mass of the bale in the standard atmosphere; and

$R$  = moisture content, percent.

## 7 PACKING

The hanks of yarn shall be packed as agreed to between the buyer and the seller.

## 8 MARKING

8.1 A label giving the following particulars shall be attached to each bale:

- Type and grade number of the yarn, and
- Any other information required by the buyer or by the law in force.

### 8.1.1 BIS Certification Marking

The hanks and the bale may also be marked with the Standard Mark.

8.1.2 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

**Table 1 Constructional Details of 2-Ply Coir Yarns**  
(Clauses 4 and 5.5)

Type of Coir Yarn	Grade No.	Scorage (Approx)	Linear Density (Runnage) m/kg	Turns/m Min	Breaking Load, N Min
(1)	(2)	(3)	(4)	(5)	(6)
Anjengo	YA1	17+	360	92+	156
	YA2	16+ to 17	330	90+ to 92	176
	YA3	15+ to 16	300	86+ to 90	196
	YA4	14+ to 15	275	82+ to 86	215
	YA5	13+ to 14	240	78+ to 82	235
	YA6	12+ to 13	220	74+ to 78	255
	YA7	11+ to 12	200	70+ to 74	275
Anjengo M	YM1	14+	190	85+	200
	YM2	13+ to 14	170	83+ to 85	250

Table 1 (concluded)

Type of Coir Yarn	Grade No.	Scorage (Approx)	Linear Density (Runnage) m/kg (4)	Turns/m Min (5)	Breaking Load, N Min (6)
(1)	(2)	(3)			
	YM3	12+ to 13	150	81 + to 83	275
	YM4	11+ to 12	130	78 + to 81	295
	YM5	10+ to 11	110	75 + to 78	310
Aratory	YR1	17+	330	88 +	115
	YR2	16+ to 17	300	84 + to 88	135
	YR3	15+ to 16	280	80 + to 84	175
	YR4	14+ to 15	260	76 + to 80	195
	YR5	13+ to 14	240	72 + to 76	215
	YR6	12+ to 13	220	68 + to 72	200
	YR7	11+ to 12	200	64 + to 68	250
Alappat	YL1	14+	230	52 +	175
	YL2	13+ to 14	190	50 + to 52	225
	YL3	12+ to 13	180	48 + to 50	250
	YL4	11+ to 12	170	44 + to 48	265
Ashtamudy	YD1	12+	140	50 +	295
	YD2	11+ to 12	130	48 + to 50	310
	YD3	10+ to 11	120	46 + to 48	350
	YD4	9+ to 10	110	42 + to 46	370
	YD5	8+ to 9	90-110	38 + to 42	390
Beach	YB1	13+	260	46 +	90
	YB2	12+ to 13	250	44 + to 46	70
	YB3	11+ to 12	240	42 + to 44	60
Bey pore	YY1	8+	90	38 +	390
	YY2	7+ to 8	80	34 + to 38	420
	YY3	6+ to 7	70	32 + to 36	440
Parur	YP1	11+	140	56 +	300
	YP2	10+ to 11	130	50 + to 56	320
	YP3	9+ to 10	115	46 + to 50	340
	YP4	8+ to 9	105	42 + to 46	370
	YP5	7+ to 8	95	38 + to 42	400
	YP6	6+ to 7	85	36 + to 40	440
Quilandy	YQ1	11+	130	48 +	390
	YQ2	10+ to 11	120	46 + to 48	470
	YQ3	9+ to 10	110	44 + to 46	540
	YQ4	8+ to 9	100	40 + to 44	590
Roping	YO1	5+	60	26 +	390
	YO2	4+ to 5	50-55	22 + to 26	430
Vycome	YV1	16+	300	58 +	30
	YV2	15+ to 16	280	54 + to 58	40
	YV3	14+ to 15	260	50 + to 54	50
	YV4	13+ to 14	240	46 + to 50	80
	YV5	12+ to 13	220	43 + to 48	100
	YV6	11+ to 12	200	40 + to 45	125
Method of Test		Annex A	Annex E	IS 832	IS 1670



## 9 SAMPLING AND CRITERIA FOR CONFORMITY

### 9.1 Sampling

#### 9.1.1 Lot

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

9.1.2 The conformity of a lot to the requirements of the 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 col 2 of Table 2.

9.1.3.1 The coils shall be selected at random. In order to ensure randomness of selection, all the coils 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 is obtained,  $r$  being the integral part of  $N/n$  where  $N$  is the lot size and  $n$  is the sample size.

### 9.2 Test Sample and Test Specimens

#### 9.2.1 Colour

For determining the colour, hanks drawn at the rate of one hank from each bale in the gross sample shall constitute the test sample.

#### 9.2.2 Scorage, Linear Density, Turns per Metre and Breaking Load

For determining the scorage, linear density (runnage), turns per metre and breaking load of yarn, hanks drawn at random at the rate of three hanks from each bale in the gross sample shall constitute the test sample. The total number of test specimens shall be in accordance with col 3 of Table 2.

#### 9.2.3 Salt Content, Moisture Content and Sand Content

For determining the salt content, moisture content and

sand content of yarn, hanks drawn at the rate of one hank from each bale in the gross sample shall constitute the test sample. The test specimens (see B-1, C-1 and D-1) shall be drawn at the rate of one specimen from each hank in the test sample. The test specimens for moisture content shall be weighed immediately after sampling to avoid any change in the mass due to absorption or desorption of moisture due to atmospheric conditions. If it is not possible to weigh immediately, the hanks shall be packed in polythene bags or other air-tight container soon after sampling.

### 9.3 Criteria for Conformity

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

- The average of all the values of scorage, runnage, turns per metre and breaking load are in accordance with the applicable value of the relevant grade; and
- The average and the range calculated from the test results for salt content, moisture content and sand content satisfy the conditions given below:

$$\bar{X} + 0.6 \leq \text{Maximum limit indicated in the appropriate clauses}$$

where

$\bar{X}$  = value obtained by dividing the sum of the test results by the number of test results, and

$R$  = the difference between the maximum and the minimum values of the test results.

- From the test results for turns per metre of plied yarn, runnage and breaking load, the average  $\bar{X}$  and the range  $R$  is determined, and the value of the expression  $\bar{X} - 0.4 R$  is greater than or equal to the relevant specified.

**Table 2 Size of Gross Sample and Number of Test Specimens for Scorage, Runnage, Turns per Metre and Breaking Load Determination (Clauses 9.1.3 and 9.2.2)**

No. of Bales in the Lot	No. of Bales in the Gross Sample	No. of Test Specimens for Scorage, Linear Density Turns per Metre and Breaking Load
(1)	(2)	(3)
Up to 10	2	18
11 to 20	3	27
21 to 40	4	36
41 to 60	5	45
61 to 100	6	54
101 and above	7	63

## ANNEX A

( Table 1 )

## METHOD FOR DETERMINATION OF SCORAGE

## A-1 TEST SPECIMENS

For the purpose of this test, pieces of yarn drawn from the test sample as in 9.2.2 shall constitute the test specimens.

## A-2 APPARATUS

For the purpose of this test, a wooden dumb-bell shaped gadget as shown in Fig. 1 shall be used.

## A-3 PROCEDURE

A-3.1 Take a test specimen (*see* 9.2.2), wind it under tension to prevent kinking but without stretching, on the central portion of the gadget, so that the successive

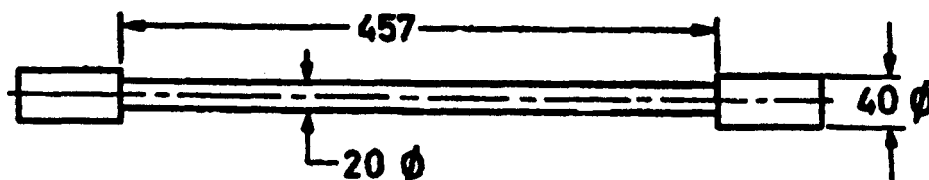
wrappings of the yarn are in close contact but without overlapping. Count the total number of such wrappings.

A-3.2 Calculate the scorage of the test specimen by the formula given below:

$$\text{Scorage of yarn} = \frac{\text{Total number of wrappings counted}}{10}$$

A-3.3 Determine similarly the scorage of the remaining test specimens and calculate the average of all the observations.

A-3.4 Determine the conformity of a lot as given in 9.3 (a).



All dimensions in millimetres.

FIG. 1 APPARATUS FOR THE DETERMINATION OF SCORAGE

## ANNEX B

( Clauses 5.2 and 9.2.3 )

## METHOD FOR DETERMINATION OF SALT CONTENT

## B-1 TEST SPECIMENS

B-1.1 For the purpose of this test, test specimen weighing approximately 5 g shall be drawn from the test sample as in 9.2.3.

## B-2 CONDITIONING OF TEST SPECIMENS

B-2.1 Prior to evaluation, the test specimens shall be conditioned in standard atmosphere at  $65 \pm 2$  percent relative humidity and  $27 \pm 2^\circ\text{C}$  temperature (*see also* IS 6359) for 48 h.

## B-3 REAGENTS

## B-3.0 Quality of Reagents

Unless specified otherwise pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

## B-3.1 Nitric Acid — 6 N.

## B-3.2 Silver Nitrate Solution

## B-3.3 Nitrobenzene — of reagent grade.

## B-3.4 Ferric Alum Indicator

## B-3.5 Standard Potassium Thiocyanate Solution

## B-4 PROCEDURE

B-4.1 Immediately after conditioning (*see* B-2), weigh one test specimen. Boil it in 200 ml of distilled water (*see* IS 1070) for 30 min. Decant the extract into a beaker and re-extract the test specimen twice, each time boiling with 100 ml of distilled water for 15 min, and decanting the extract into the same beaker (*see* Note). Filter the extract so decanted, allow it to cool to room temperature and make up the volume to 500 ml with distilled water. Transfer 25 ml of the extract to a conical

flask and add 5 ml of nitric acid. Add to this a measured excess of silver nitrate from a burette. Add also 3 ml of nitrobenzene and 1 ml of ferric alum indicator and shake the mixture vigorously to coagulate the precipitate. Titrate the mixture against standard solution of potassium thiocyanate. Take the end point to have been reached when the aqueous solution turns red which does not fade after 5 min.

**NOTE** — In case sodium chloride is not completely extracted, it may be necessary to repeat the boiling of the test specimen with more water. To test for the complete extraction of sodium chloride the usual procedure is to wash the test specimen with about 50 ml of hot distilled water and to about 5 ml of the washings, so obtained, a few drops of silver nitrate solution is added. If the washings now show any turbidity, the presence of sodium chloride in the test specimen due to incomplete extraction is indicated.

**B-4.1.1** Make a blank determination with all the reagents but taking distilled water instead of the extract.

**B-4.2** Calculate the percentage of sodium chloride by the following formula:

$$\text{Sodium chloride, percent} = \frac{N \times (V_1 - V_2) 20 \times 5.846}{W} \times 100$$

where

$N$  = normality of the potassium thiocyanate solution,

$V_1$  = volume of the potassium thiocyanate solution required for blank titration (see B-4.1.1),

$V_2$  = volume of the potassium thiocyanate solution required for the titration (see B-4.1), and

$W$  = weight of the test specimen after conditioning.

**B-4.3** Determine similarly the percentage of sodium chloride in the remaining test specimens.

**B-4.4** Calculate the average and range of all the observations.

**B-4.5** Determine the conformity of a lot to 5.2 as given in 9.3 (b).

## ANNEX C

(Clauses 5.3, 6.2 and 9.2.3)

### METHOD FOR DETERMINATION OF MOISTURE CONTENT

#### C-1 TEST SPECIMENS

For the purpose of this test, test specimens each weighing about 100 g shall be drawn from the test sample as in 9.2.3.

#### C-2 APPARATUS

**C-2.0** For the purpose of this test, the following apparatus shall be used.

##### C-2.1 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 coir yarn with an accuracy of 0.5 g while suspended within the drying chamber; the holder of the yarn to be of such a type so as to ensure free access of dry air to all portions of the yarn.

#### C-3 PROCEDURE

**C-3.1** Weigh the test specimen to the nearest 0.5 g (see Note). Place it in the conditioning oven, 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. In case the loss in mass in drying of the test specimen as disclosed by the first and second weighing 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, repeat alternate drying and weighing till the difference between the two successive weighings is 0.25 percent or less of the first of the two masses.

**NOTE** — Usually, soon after sampling, the test specimens are weighed accurately and the procedure C-3.1 is continued. If, however, it is not done so, the test specimens are sealed in air-tight containers soon after sampling (see 9.2.3); for determining the moisture content, these test specimens are taken out and weighed accurately, and the procedure under C-3.1 is continued.

**C-3.2** Calculate the percentage of moisture content by the following formula:

$$\text{Moisture content, percent} = \frac{(W_1 - W_2)}{W_1} \times 100$$

where

$W_1$  = weight of the original test specimen, and

$W_2$  = weight of the oven-dry test specimen.

**C-3.3** Determine similarly the moisture content, percent, of the remaining specimens.

**C-3.4** Calculate the average and range of all the observations.

**C-3.5** Determine the conformity of a lot to 5.3 as given in 9.3 (b).

## ANNEX D

( *Clauses 5.4 and 9.2.3* )

## METHOD FOR DETERMINATION OF SAND CONTENT

## D-1 TEST SPECIMENS

**D-1.1** For the purpose of this test, test specimens each weighing about 50 g shall be drawn from the test sample as given in 9.2.3.

## D-2 CONDITIONING OF THE SPECIMENS

**D-2.1** Prior to evaluation, the test specimens shall be conditioned in standard atmosphere at  $65 \pm 2$  percent relative humidity and  $27 \pm 2^\circ\text{C}$  temperature (*see also* IS 6359 ) for 48 h.

## D-3 PROCEDURE

**D-3.1** Immediately after conditioning (*see* D-2.1), weigh one test specimen to the nearest 0.5 g. Burn it in an iron pan (*see* Note) to ash. Put the ash in water and allow the sand to settle. Separate the sand, condition it and weigh it.

NOTE — Kerosine oil may be used to quicken the process of burning.

**D-3.2** Calculate the sand content by the following formula :

$$\text{Sand content, percent} = \frac{W_2}{W_1} \times 100$$

where

$W_2$  = weight of sand in g, and

$W_1$  = weight of conditioned test specimen in g.

**D-3.3** Determine similarly the sand content, percent, of the remaining test specimens.

**D-3.4** Calculate the average and range of all the observations ( *see* D-3.2 and D-3.3 ).

**D-3.5** Determine the conformity of a lot to 5.4 a: given in 9.3 (b).

## ANNEX E

( *Table 1 and Clause 9.2.2* )

## METHOD FOR DETERMINATION OF LINEAR DENSITY (RUNNAGE)

**E-1** Take off from the skein a test specimen of 10 m length measured under a tension of 2 percent of the specified breaking load. Condition the specimen to

moisture equilibrium and determine the mass. On the basis of the result obtained, calculate the length in metres per kilogram of the yarn.

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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 Handbook' and 'Standards : Monthly Additions'.

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#### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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