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IS 9308-4 (1999): Mechanically Extracted Coir Fibres, Part 4: Machine Twisted Curled Coir Fibres [TXD 25: Coir and Coir Products]



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भारतीय मानक

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भाग 4 मशीन द्वारा ऐठित नारियल जटा के छल्लेदार रेशे

Indian Standard

**MECHANICALLY EXTRACTED COIR FIBRES —
SPECIFICATION**

PART 4 MACHINE TWISTED CURLED COIR FIBRES

ICS 59.060.01

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

FOREWORD

This Indian Standard (Part 4) 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.

The need for formulating an Indian Standard on curled coir fibre has been felt as it is used as a major raw material in the manufacture of consumer goods like rubberized coir sheets for cushioning and moulded rubberized coir cushioning.

Parts 1, 2 and 3 of the standard cover requirements for bristle fibres, mattress coir fibres and decorticated coir fibres respectively. This part in the series (Part 4) covers the requirements for curled coir fibres.

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, 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***MECHANICALLY EXTRACTED COIR FIBRES —
SPECIFICATION****PART 4 MACHINE TWISTED CURLED COIR FIBRES****1 SCOPE**

This standard (Part 4) prescribes the requirements and methods of test for machine twisted curled coir fibres of commercial grade.

2 REFERENCES

The following standards 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 below:

<i>IS No.</i>	<i>Title</i>
4202 : 1967	Method for determination of chloride content of textile materials
4203 : 1967	Method for determination of sulphate content in textile materials
9308 (Part 1) : 1987	Specification for mechanically extracted coir fibres: Part 1 Bristle coir fibre (<i>first revision</i>)

3 TERMINOLOGY

For the purpose of this standard the following definitions shall apply.

3.1 Machine Twisted Curled Coir Fibre

A product made out of mechanically extracted coir fibres by regulated and even feeding of the fibres with the help of a mechanical arrangement in curling machines to form a thick strand of evenly distributed parallelised fibres which is processed further to form twisted curled rope of continuous length.

3.2 Designation of Fibres

The coir fibres are designated on the basis of length as under:

Long fibres	Above 200 mm
Medium fibres	Above 150 mm and up to 200 mm
Short fibres	Above 50 mm and up to 150 mm

4 ATMOSPHERIC CONDITIONS FOR TESTING

Unless otherwise specified in the contract/order, all tests shall be carried out in a standard atmosphere at 65 ± 2 percent relative humidity and $27 \pm 2^\circ\text{C}$ temperature.

5 REQUIREMENTS**5.1 Twist, Diameter and Mass of Coil**

The curled coir fibre ropes shall be machine twisted with 16 to 24 curls per 300 mm having diameter as agreed to between the buyer and the seller and wound into coil weighing 25 to 30 kg. The variation in the diameter of curled rope in the same coil shall not exceed 3 mm.

Methods of test are given in Annex A.

5.2 Proportion by Mass of Fibres of Different Lengths

The proportion by mass of long, medium and short fibres in the curled coir fibre rope shall be as given below when determined by the method given in Annex B:

Long fibres	10 percent, <i>Min</i>
Medium fibres	50 percent, <i>Max</i>
Short fibres	20 percent, <i>Max</i>

5.3 Impurities

The impurities, mainly pith, dust, bits of exocarp and fibre bits below 50 mm shall not exceed 10 percent when determined by the method prescribed in Annex C.

5.4 Texture

The machine twisted curled fibre shall be hard twisted with curls evenly distributed along the length.

5.5 Moisture Content

The moisture content of machine twisted curled coir fibre rope shall not exceed 15 percent when determined by the method described in Annex D.

5.6 Chloride Content

The chloride content of the curled coir fibres when determined by the method prescribed in IS 4202, shall not exceed 0.6 percent by mass.

5.7 Sulphate Content

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

6 CORRECTED NET MASS

The corrected net mass of the lot shall not be less than the contract mass and shall be calculated by adding 18 percent moisture regain to its oven-dry mass. The oven-dry mass of each bale shall be calculated from its net mass and the moisture content; and later being determined by method prescribed in Annex D.

7 PACKING AND MARKING

7.1 Machine twisted curled coir fibre rope shall be wound into coils and tied by 2-ply coir yarn at least at 4 places along the circumference at diametrical positions and further packed as agreed to between the buyer and the seller.

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

- a) Indication of the source of manufacture,
- b) Serial number of the coil,
- c) Weight of the coil, and
- d) Type of fibre used (Decorticated/Bristle).

7.2 BIS Certification Marking

The bales may also be marked with the Standard Mark.

7.2.1 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 the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8 SAMPLING, INSPECTION AND TESTING

8.1 Sampling

8.1.1 Lot

All coils of curled coir fibre delivered to a buyer against one despatch note shall constitute a lot.

8.1.2 The conformity of a lot to the requirements of the standard shall be determined on the basis of the

tests carried out on the coils selected from it.

8.1.3 Unless otherwise agreed to between the buyer and the seller, the number of coils to be selected from the lot shall be in accordance with col 2 of Table 1.

Table 1 Number of Coils to be Selected

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

8.1.3.1 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 coil 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.

8.1.4 For evaluating percent by mass of long, medium and short fibres; percentage of impurities; texture; chloride content; and sulphate content, about 1 kg of the coir fibres shall be selected from twenty different randomly distributed places in the selected coils by taking about 50 g of the fibre from each place. The quantity drawn from each coil shall be kept separately.

8.1.4.1 For evaluating moisture content about 500 g of the coir fibre shall be collected from 10 different randomly distributed places in the selected coils 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 moisture difference.

8.1.5 Criteria for Conformity

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

- a) The average value of percent by mass of long, medium and short fibres, and impurities, diameter, twist and weight of coil shall satisfy the requirements as specified in 5.1 to 5.3.
- b) From the observed values of moisture content, chloride content and sulphate content, the average (\bar{x}) and range (*R*) are calculated

and the expression $\bar{x} - 0.4 R$ is less than or equal to values specified in 5.4 to 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 the set of observed values.

ANNEX A

(Clause 5.1)

METHODS OF TEST FOR MASS, DIAMETER AND CURLS PER UNIT LENGTH

A-1 MASS

A-1.1 Without removing the wrapping material, if any, weigh each coil in the lot to the nearest 0.5 kg and determine the total gross mass of all the coils in the lot.

A-2 DIAMETER OF CURLED COIR ROPE

A-2.1 All the coils in the test lot shall be tested for determination of diameter. The measurement of diameter of curled coir rope may be taken by vernier calipers

correct to 1 mm recording the measurement at four points, leaving a span of 5 m between the points of measurement along the length of coil and record the mean value.

A-3 CURLS PER UNIT LENGTH

A-3.1 Each coil of test lot shall be tested for determination of curls per 300 mm using a graduated scale. The measurements may be taken at four sections along the length of the coil leaving a span of 5 mm between the sections and record the mean value.

ANNEX B

(Clause 5.2)

METHOD FOR DETERMINATION OF THE PERCENT BY MASS OF 'LONG', 'MEDIUM' AND 'SHORT' FIBRES

B-1 TEST SPECIMENS

B-1.1 Draw 3 test specimens weighing approximately 2 g each from the test sample (see 8.1.4).

B-2 EQUIPMENT

B-2.1 For the purpose of this test, a flat table marked with a scale with 10 mm graduations shall be used.

B-3 PROCEDURE

B-3.1 Take one of the test specimens and measure the length of the 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 given below:

<i>Length of the Fibre</i> mm	<i>Group</i>
Above 200	Long fibres
Above 150 and up to 200	Medium fibres
Above 50 and up to 150	Short fibres

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 5.3)

METHOD FOR DETERMINATION OF THE PERCENTAGE OF IMPURITIES

C-1 TEST SPECIMENS

C-1.1 Draw 5 test specimens weighing approximately 60 g each from the test sample (*see* 8.1.4).

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, 6 and C-2.1)

METHOD FOR DETERMINATION OF MOISTURE CONTENT

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-2.1 500 g of coir fibre (*see* 8.1.4.1) is weighed correct to the nearest 0.5 g. Place the test specimen in the conditioning oven and dry for one hour at 100 ± 2°C and weigh to the nearest 0.5 g. Dry for another 15 min. 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 of the first mass, dry and weigh the test specimen at 15 min intervals till the loss between two successive weighings is 0.25 percent or less of the first of the two masses.

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.