भारतीय मानक
Indian Standard

IS 16338 : 2015

रेशों से बनी रस्सियाँ — अनुगामी हाप बेलों के लिए कॅयर की सुतली — विशिष्टि

Fibre Ropes – Coir Twine for Trailing Hop Vines — Specification

ICS 59.080.50

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली-110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.org.in www.standardsbis.in

August 2015 **Price Group 2**

Cordage Sectional Committee, TXD 09

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after draft finalized by Cordage Sectional Committee had been approved of the Textile Division Council.

Coir twine is made from coir fibre extracted by retting or mechanical means from coconut husks. Coir twine is available in soft medium and hard twisted type spun on wheel or motorized traditional ratt, motorized ratt or automatic spinning machine. The runnage of the yarn vary depending on the type of the fibre, thickness and twist.

The term "Hop Yarn" when it refers to coir is a class name attributed by the importers in Europe, USA and Australia to Ashtamudy, Mangadan and Quiland type of coir yarn which apart from other uses are also used for agriculture purposes as support strings for hop vines. Hop vine is grown for its berries from which an extract is made for adding bittering content and a mild intoxicating effect to beer. Being a creeper, it definitely requires a host companion on which it can grow up. In olden days, the outmoded system of erecting a pole and consequent trailing on it was practiced. A scheme of raising the hop vine on iron/ copper wires for a proper structural support is practiced in certain countries.

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

FIBRE ROPES — COIR TWINE FOR TRAILING HOP VINES — SPECIFICATION

1 SCOPE

This standard specifies the requirements and methods of test for coir yarn spun by manual operation and machine used for trailing hop vines.

2 REFERENCES

The following standards 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 indicated below.

IS No.	*Title*
1070 : 1982	Reagent grade water (*third revision*)
6359 : 1971	Method for conditioning of textiles

3 TYPES AND GRADES

The coir yarn used for hop vines can be classified into types and grades as given below.

Sl No.	*Type of Coir Yarn*	*Grade*	*Runnage* m/kg	*Breaking Load*, N *Min*
(1)	(2)	(3)	(4)	(5)
i)	Spun by manual operation	MSY	110-190	250
ii)	Spun on motorized ratt	MRY	110-190	250
iii)	Spun on automatic spinning machine	ASY	110-190	250
iv)	Spun on motorized traditional ratt	MTR	110-190	250

4 REQUIREMENTS

4.1 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 by mutual agreement may be used.

4.2 Salt Content

The salt content of the 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 A.

4.3 Moisture Content

The moisture content of the yarn when tested by the method prescribed in Annex B shall not exceed 15 percent on the mass of yarn determined in standard atmosphere.

4.4 Sand Content

The sand content of the yarn when tested by the method given in Annex C shall not exceed 2 percent.

4.5 Construction and other Requirements

The yarn shall be of 2 ply or more threads of coir or other fibres or a combination of both.

5 CORRECTED INVOICE MASS

5.1 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.

5.2 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 B

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

where

W_1 = net mass of the bale in the standard atmosphere, and

R = moisture content, percent

6 PACKING

Packed in bundles of 10 strings of coir yarn, each string has a length of 20 m or packed as bundles of 100 strings, and such string bundle to form a bale of 160 kg. It can also be made to ball shapes with a length of 620 m.

7 MARKING

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

a) Type and grade of the yarn, and
b) Any other information required by the buyer or by the law in force.

7.2 BIS Certification Marking

The packings may also be marked with the Standard Mark.

7.2.1 The use of the Standard Mark is governed by the provisions of the *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 the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8 SAMPLING AND CRITERIA FOR CONFORMITY

8.1 Sampling

8.1.1 *Lot*

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

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 bales selected from it.

8.1.3 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 1.

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 bale may be selected until the requisite number is obtained, *r* being the integral of *N*/*n* where *N* is the lot size and *n* is the sample size.

8.2 Test Sample and Test Specimen

8.2.1 *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.

8.2.2 *Runnage and Breaking Load*

For determining the runnage 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 1.

8.2.3 *Salt Content, Moisture Content and Sand Content*

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

Table 1 Size of Gross Sample and Number of Test Specimens for Runnage and Breaking Load

(*Clause* 8.2.2)

No. of Bales in the Lot	No. of Bales in the Gross Sample	No. of Test Specimen for Runnage 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

8.3 Criteria for Conformity

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

a) The average of all the values of runnage and breaking load are in accordance with the applicable value of the relevant grade, and
b) The average and the range calculated from the test result for salt content, moisture content and sand content satisfy the conditions given below:

   $X + 0.6 \leq$ Maximum limit indicated in the appropriate clauses

   where

   X = value obtained by dividing the sum of the test results by the number of test results

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

c) From the test results for the turns per meter of piled yarn, runnage and breaking load, the average X and the range R is determined, and the value of the expression $X - 0.4R$ is greater than or equal to the relevant specified.

ANNEX A

(*Clauses* 4.2 *and* 8.2.3)

METHOD FOR DETERMINATION OF SALT CONTENT

A-1 TEST SPECIMEN

For the purpose of this test, test specimen weighting approximately 5 g shall be drawn from the test sample as given in **8.2.3**.

A-2 CONDITIONING OF TEST SPECIMENS

Prior to evaluation, the test specimen shall be conditioned in standard atmosphere at 65 ± 2 percent relative humidity and 27 ± 2 °C temperature (*see also* IS 6359) for 48 h.

A-3 REAGENTS

A-3.0 Quality of Reagents

Unless specified otherwise pure chemicals and distilled water (*see* IS1070) shall be employed in tests.

A-3.1 Nitric Acid – 6 N

A-3.2 Silver Nitrate Solution

A-3.3 Nitrobenzene – of reagent grade

A-3.4 Ferric Alum Indicator

A-3.5 Standard Potassium Thiocyanate Solution

A-4 PROCEDURE

A-4.1 Immediately after conditioning (*see* **A-2**) weigh one test specimen. Boil it to 200 ml of distilled water 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. 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 extract into 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.

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

A-4.2 Calculation the percentage of sodium chloride by the following formula:

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

where

N = normality of the potassium thiocyanate solution,

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

V_2 = volume of the potassium thiocyanate solution required, for the titration (*see* **A-4.1.1**), and

W = weight of the test specimen after conditioning.

A-4.3 Determine similarly the percentage of sodium chloride in the remaining test specimen.

A-4.4 Calculate the average and range of all observations.

A-4.5 Determine the conformity of a lot to **4.2** as given in **8.3** (b).

ANNEX B

(*Clauses* 4.3, 5.2 *and* 8.2.3)

METHOD FOR DETERMINATION OF MOISTURE CONTENT

B-1 TEST SPECIMEN

B-1.1 For the purpose of this test, test specimen weighting approximately 100 g shall be drawn from the test sample as in **8.2.3**.

B-2 APPARATUS

B-2.1 Conditioning Oven

With forced ventilation, provided with positive value

control and capable of maintaining a temperature of 100 to 110 °C; equipped with a weighing balance arranged to weight 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.

B-3 PROCEDURE

B-3.1 Weight the test specimen to the nearest 0.5 g. 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 weighing is 0.25 percent or less of the first two masses.

B-3.2 Calculate the percentage of moisture content by the following formula

$$\text{moisture content} = \frac{(W_1 - W_2) \times 100}{W_1}$$

where

W_1 = weight of the original test specimen, and

W_2 = weight of the oven dry specimen.

B-3.3 Determine similarly the moisture content percent of the remaining specimens.

B-3.4 Calculate the average and range of all observations.

B-3.5 Determine the conformity of a lot to **4.3** as given in **8.3** (b)

ANNEX C

(*Clauses* 4.3, 5.2 *and* 8.2.3)

METHOD FOR DETERMINATION OF SAND CONTENT

C-1 TEST SPECIMEN

For the purpose of this test, test specimen weighting approximately 50 g shall be drawn from the test sample as in **8.2.3**.

C-2 CONDITIONING OF TEST SPECIMENS

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

C-3 PROCEDURE

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

C-3.2 Calculate the sand content by the following formula

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

where

W_1 = weight of conditioned test specimen, and

W_2 = weight of sand in g.

C-3.3 Determine similarly the sand content percent of the remaining specimens.

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

C-3.5 Determine the conformity of a lot to **4.4** as given in **8.3** (b).

ANNEX D

(*Clauses* 4.3, 5.2 *and* 8.2.3)

METHOD FOR DETERMINATION OF RUNNAGE

D-1 Take off from the test sample 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 results obtained, calculate the length in metre per kilogram of the yarn.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 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'.

This Indian Standard has been developed from Doc No.: TXD 09 (1203).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.org.in

Regional Offices: *Telephones*

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002 — 2323 7617, 2323 3841

Eastern : 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi, KOLKATA 700054 — 2337 8499, 2337 8561, 2337 8626, 2337 9120

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022 — 260 3843, 260 9285

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113 — 2254 1216, 2254 1442, 2254 2519, 2254 2315

Western : Manakalaya, E9 MIDC, Marol, Andheri (East), MUMBAI 400093 — 2832 9295, 2832 7858, 2832 7891, 2832 7892

Branches: AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. DEHRADUN. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KOCHI. LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAJKOT. VISAKHAPATNAM.

Published by BIS, New Delhi