भारतीय मानक ब्यूरो BUREAU OF INDIAN STANDRADS

Draft For Comments Only

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भारतीय मानक मसौदा

वस्त्रादि — जूट धागे का सार्वभौमिक सूतांक के निर्धारण की विधियाँ

(आई एस 570 का दूसरा पुनरीक्षण)

Draft Indian Standard

TEXTILES — METHODS FOR DETERMINATION OF UNIVERSAL COUNT OF JUTE YARN

(Second Revision of IS 570)

ICS 59.080.20

Physical Methods of Test Sectional Committee, TXD 01 Last date for receipt of comments is 10 March 2024

FOREWORD

(Formal clauses will be added later)

This standard was first published in 1954 and subsequently revised in 1964. This revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

- a) Incorporate some definitions like moisture regain, moisture equilibrium etc. in the terminology;
- b) The temperature for oven dry has been modified; and
- c) References to Indian standards have been updated.

This standard was first published in 1954 in which all quantities and dimensions were expressed in fps system units. With the adoption of metric system in India, the Sectional Committee decided to revise the standard with a view to changing over to the metric system. Therefore, all quantities and dimensions in the revision have been expressed in the metric system. This opportunity has been taken to make some modifications. In the original standard, four methods each were prescribed for determining the grist (count) of yarn under standard atmospheric conditions and prevailing atmospheric conditions. In this revision, this procedure has been simplified and only one method each is prescribed for determining the universal count of jute yarn under standard atmospheric conditions and prevailing atmospheric conditions.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'.

1 SCOPE

This standard prescribes two methods for determination of universal count of jute yarn. The methods are applicable to single, plied or cabled yarn.

NOTE — In the case of plied or cabled yarn, the methods are applicable for determination of its resultant count.

2 REFERENCES

The standard listed 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 the standard indicated below:

IS No.	Title	
IS 196 : 1966	Atmospheric conditions for testing (revised)	
IS 6359 : 2023	Method for conditioning of textiles (first revision)	

3 PRINCIPLE

The first method is based on determining the universal count of yarn after conditioning the test specimens in the standard atmosphere. The second method is based on determining the weight of the specimen by drying it in a drying oven and calculating, from this weight, its conditioned weight by adding the moisture regain value.

4 TERMINOLOGY

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

4.1 Grist — The weight in pounds of one spindle (14 400 yd) of yarn.

4.2 Moisture Equilibrium — Moisture Equilibrium is the condition achieved by a sample at a precisely defined temperature and relative humidity when the net difference between the absorbed and desorbed moisture, indicated by a change in mass, exhibits no discernible trend and becomes negligible.

4.3 Moisture Equilibrium for Testing — A textile material is in moisture equilibrium with the ambient atmosphere when it does not exchange water with this atmosphere; its mass then remains constant as long as the experiment is carried out in an unchanged atmosphere. For test purposes, moisture equilibrium is reached by absorption starting from a relatively low moisture content. Moisture equilibrium for testing is considered as having been reached when the rate of increase in mass of a sample or specimen due to moisture uptake does not exceed that prescribed for the material being tested (*see* IS 6359).

4.4 Moisture Regain — Moisture regain is defined as the percentage of water present in a textile material of oven-dry weight. The percentage of moisture in a textile material brought into equilibrium with a standard atmosphere after partial drying, calculated as a percentage of the moisture-free weight.

4.5 Universal Count, in Tex — Universal count is a number indicating the weight of yarn per unit length, the basic unit of which is the tex. When universal count of yarn is expressed in tex, the count value indicates the weight in gram of one kilometre of yarn.

NOTE — The weight per unit length of fibres as well as of textile products like ropes, rovings, etc, may also be expressed in universal count, and in such cases, the following sub-multiple and multiple units may be used to avoid small fractions and large numbers respectively:

1 mtex (millitex) = 0.001 tex 1 ktex (kilotex) = 1000 tex

5 SAMPLING

5.1 Lot

A quantity of jute yarn of one definite count and quality delivered to one buyer against one despatch note.

5.2 The conformity of a lot to a specification shall be determined on the basis of test carried out on the sample selected from the lot.

5.3 Unless otherwise agreed upon between the buyer and the seller, the total number of bales (or trusses) to be taken at random from a lot shall be in accordance with the requirements of Table 1.

Table 1 Number of Bales (or Trusses) to be Selected from the Lot(Clauses 5.3 and 5.4)

Sl No.	No. of Bales (or Trusses)	No. of Bales (or Trusses) to		
	in a Lot	be Taken		

(1)	(2)	(3)
i)	2 to 25	1
ii)	26 to 50	2
iii)	51 to 75	3
iv)	76 to 100	4
v)	Above 100	3 percent of the additional
		bales

5.4 One bundle of yarn shall be drawn from each of the bales (or trusses) drawn as in Table 1. However, if the number of bundles in a bale (or truss) is more than 25, two bundles shall be drawn from each of the bales (or trusses) drawn.

5.5 In case the yarn is on cones, the number of cones to be taken at random from the lot shall be in accordance with the requirements of Table 2.

Sl No.	No. of Cones in the Lot	No. of Cones to be Selected
(1)	(2)	(3)
i)	Up to 100	2
ii)	101 to 150	3
iii)	151 to 500	5
iv)	501 to 1 000	8
v)	1 001 to 3 000	13
vi)	3 001 and above	20

Table 2 Number of Cones to be Selected from the Lot(Clause 5.5)

5.6 From each of the bundles drawn as in **5.4**, two skein, each 100 m long, shall be reeled off from different parts of the bundle, on a wrap reel with a girth of two metres. When being reeled, the yarn shall be kept under sufficient tension to avoid kinks, curls, and slacks in the yarn on the one hand, and stretch on the other, operating the reel at a speed of 100 rev/min to 200 rev/min. In case the yarn is on cones, one 100 m long skein shall be reeled off from each cone drawn as in **5.5**. The skeins so reeled shall constitute the test specimens.

5.6.1 In case the procedure prescribed in **5.6** provides less than 10 test specimens from the lot, further test specimens shall be taken from the selected bundles or cones (*see* **5.4** and **5.5**) to bring the number of test specimens up to 10.

6 ATMOSPHERIC CONDITIONS FOR TESTING

The test prescribed in **9.2** shall be carried out in a standard atmosphere at (65 ± 2) percent relative humidity and 27 °C ± 2 °C temperature (*see* also IS 196).

7 CONDITIONING OF SPECIMENS

When the test is to be carried out by the method prescribed in 9.2 prior to evaluation, the test specimens shall be left to reach the moisture equilibrium for testing by exposing them in the standard atmosphere at (65 ± 2) percent relative humidity and ($27^{\circ}C \pm 2^{\circ}C$) temperature for 48 h in such a way as to expose, as far as possible, all portions of the specimens to the atmosphere (*see* IS 6359).

8 APPARATUS

For the purpose of this test, the following apparatus shall be used:

8.1 Drying Oven

Of a suitable capacity to hold about 500 g of yarn, preferably of the ventilated type with positively induced draught, capable of maintaining an inside temperature of 105 °C \pm 3 °C and provided with a balance which weighs correct to 0.1 g.

8.2 Pan Balance

With weights in grams and capable of weighing accurate to 0.1 g.

9 PROCEDURE

9.1 Determine the universal count of yarn by the method prescribed in **9.2** or **9.3** as agreed to between the buyer and the seller or as specified in the material specification. In case of dispute, however, the method specified in **9.3** shall be followed.

9.2 First Method

9.2.1 Take one of the conditioned skeins (*see* **7**) constituting the test specimens and weigh it correct to the nearest 0.1 g. Calculate its universal count in the manner prescribed in **9**.

9.3 Second Method

9.3.1 Take a skein of yarn constituting the test specimens (*see* **5.5**) and dry it to constant weight at 105 °C \pm 3 °C in the drying oven. Determine its constant weight. Stop the draught through the oven during weighing. Take the weight to be constant when the difference between the two consecutive weighings at an interval of 20 minutes is less than 0.1 percent of the first weight.

NOTE — In order to avoid risk of oil evaporation, the draught in the drying oven shall not be continued throughout the drying period but shall be in operation only intermittently.

9.3.2 Calculate the conditioned weight of the skein by the formula given below:

Conditioned weight of the skein = $\frac{A(100+R)}{100}$

where

A = oven-dry weight, in g, of the specimen; and

R = moisture regain value of 17 percent.

10 CALCULATION AND REPORT

10.1 Calculate the universal count of the test specimen using the formula given below:

Universal count, in tex = $\frac{W}{L} \times 1000$

where

W = weight, in g, of the test specimen determined either as in 9.2.1 or 9.3.2; and L = length, in m, of the test specimen.

10.2 Repeat the procedure prescribed in 9.2 or 9.3 with the remaining test specimens in the sample and determine their universal count in tex.

10.3 Calculate the mean of all the values and report it as the universal count, in tex, of the yam in the lot. The report also the method followed for determining the universal count.

11 CONVERSION OF GRIST INTO UNIVERSAL COUNT AND VICE VERSA

11.1 For conversion of grist to universal count in tex, use the following formula:

$$T_t = T_j \times 34.45$$

where

 T_t = universal count, in tex; and T_j = grist, in lb.

11.2 For conversion of universal count to grist, use the following formula:

$$T_j = T_t \times 0.029$$

where T_j and T_t are same as in **11.1**.

11.3 For convenience, Table 3 may, wherever possible, be used for converting grist values into universal count in tex.

Sl No.	Grist	0	10	20	30
		tex	tex	tex	tex
(1)	(2)	(3)	(4)	(5)	(6)
i)	0		345	690	1 035
ii)	0.5	—	360	705	—
iii)	1.0	—	380	725	
iv)	1.5	—	395	740	
v)	2.0	—	415	760	
vi)	2.5	85	430	775	
vii)	3.0	105	450	790	—
viii)	3.5	120	465	810	_
ix)	4.0	140	480	825	
x)	4.5	155	500	845	
xi)	5.0	170	515	860	
xii)	5.5	190	535	880	
xiii	6.0	205	550	895	
xiv)	6.5	225	570	910	
xv)	7.0	240	885	930	
xvi)	7.5	260	605	945	
xvii)	8.0	275	620	965	
xviii)	8.5	295	635	980	
xix)	9.0	310	655	1000	
xx)	9.5	325	670	1015	
	Note — Tex values rounded off to nearest 5 units.				

Table 3 Grist to Universal Count, in Tex(Clause 11.3)