IS : 1671 - 1977
(Amalgamating IS : 239 - 1951)

Indian Standard

METHOD FOR DETERMINATION OF YARN STRENGTH PARAMETERS OF YARNS SPUN ON COTTON SYSTEM

(First Revision)

UDC 677·21·061·1 : 677·017·4

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Rs 7·00 Gr 4

February 1978

IS : 1671 - 1977
(Amalgamating IS : 239 - 1951)

Indian Standard

METHOD FOR DETERMINATION OF YARN STRENGTH PARAMETERS OF YARNS SPUN ON COTTON SYSTEM

(First Revision)

Physical Methods of Test Sectional Committee, TDC 1

Chairman	*Representing*
SHRI T. V. ANANTHAN	The Bombay Textile Research Association, Bombay
Vice-Chairman	
DR V. SUNDARAM	Cotton Technological Research Laboratory (ICAR), Bombay
Members	
SHRI M. RADHAKRISHNAN (*Alternate* to Shri T. V. Ananthan)	
DR V. G. MUNSHI (*Alternate* to Dr V. Sundaram)	
AGRICULTURAL MARKETING ADVISER TO THE GOVERNMENT OF INDIA	Directorate of Marketing & Inspection (Ministry of Agriculture), Faridabad
SHRI S. JAYARAMAN (*Alternate*)	
DR B. L. BANERJEE	Indian Jute Industries Research Association, Calcutta
DR U. MUKHOPADHAY (*Alternate*)	
SHRI K. K. CHATTERJEE	Office of the Jute Commissioner, Calcutta
SHRI G. N. CHATTERJI	Ministry of Defence (R & D)
SHRI J. N. MISRA (*Alternate*)	
DR D. B. DAS	Indian Jute Mills Association, Calcutta
SHRI DHARAM DEV	Office of the Textile Commissioner, Bombay
SHRI S. P. GHOSAL (*Alternate*)	
SHRI A. R. S. GOPALACHAR	Central Silk Board, Bombay
DR B. V. IYER	Ahmadabad Textile Industry's Research Association, Ahmadabad
SHRI A. RAJAGOPALAN (*Alternate*)	
SHRI S. V. JIGJINNI	The National Rayon Corporation Ltd, Bombay
SHRI D. S. NADKARNI (*Alternate*)	

(*Continued on page* 2)

(*Continued from page* 1)

Members	*Representing*
SHRIMATI A. KAPLASH	The Silk & Art Silk Mills' Research Association, Bombay
DR B. R. MANJUNATHA	Textiles Committee, Bombay
SHRI V. VENUGOPAL (*Alternate*)	
SHRI R. K. MEHRA	Ministry of Defence (DGI)
SHRI N. K. NAGPAUL (*Alternate*)	
DR M. G. NARSIAN	The Raymond Woollen Mills Ltd, Bombay
SHRI K. P. RAMAKRISHNA PILLAY	The South India Textile Research Association, Coimbatore
REPRESENTATIVE	Directorate General of Supplies & Disposals (Inspection Wing), New Delhi
SHRI R. R. SHANBAGH	Wool Research Association, Bombay
SHRI M. G. THANAWALA	M. Best Cotton Rope Manufacturing Co, Bombay
SHRI S. M. CHAKRABORTY, Director (Tex)	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI D. R. KOHLI
Deputy Director (Tex), ISI

Subcommittee for Physical Methods of Test for Cotton, TDC 1 : 1

Convener	
DR V. SUNDARAM	Cotton Technological Research Laboratory (ICAR), Bombay
Members	
DR V. G. MUNSHI (*Alternate* to Dr V. Sundaram)	
SHRI P. C. AGRAWAL	Ministry of Defence (R & D)
SHRI R. C. CHAKRAVARTI (*Alternate*)	
SHRI A. CHELLARAJ	Madura Coats, Madurai
SHRI H. D. GUPTRUP	Ministry of Defence (DGI)
SHRI B. P. SEN (*Alternate*)	
DR B. V. IYER	Ahmadabad Textile Industry's Research Association, Ahmadabad
SHRI A. RAJAGOPALAN (*Alternate*)	
SHRI P. S. JAIN	The Delhi Cloth & General Mills Co Ltd, Delhi
SHRI V. S. JAYARAM	The Mafatlal Fine Spg & Mfg Co Ltd, Bombay
DR B. R. MANJUNATHA	Textiles Committee, Bombay
SHRI V. VENUGOPAL (*Alternate*)	
SHRI M. RADHAKRISHNAN	The Bombay Textile Research Association, Bombay
SHRI V. S. RISBUD	Victoria Jubilee Technological Institute (Central Technological Institute, Maharashtra State), Bombay
PROF D. B. AJGAONKAR (*Alternate*)	
SHRI K. G. SETHURAM	The Century Spinning & Mfg Co Ltd, Bombay
SHRI MAHESH SHARMA (*Alternate*)	
SHRI K. S. SHANKARANARAYANA	The South India Textile Research Association, Coimbatore
SHRI M. N. UPPONI	Shree Ram Mills Limited, Bombay

Indian Standard

METHOD FOR DETERMINATION OF YARN STRENGTH PARAMETERS OF YARNS SPUN ON COTTON SYSTEM

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 November 1977, after the draft finalized by the Physical Methods of Test Sectional Committee had been approved by the Textile Division Council.

0.2 The standard for determination of lea breaking load and count strength product of cotton yarns, namely, IS : 239-1951* was prepared in 1951. After the introduction of metric system in the country, IS : 1671-1960† was prepared which prescribed the method for determination of breaking load of yarn of metric skeins, tenacity and yarn strength index. This standard also prescribed conversion factors for conversion of lea breaking load to skein breaking load in metric system and was intended to supersede IS : 239-1951*. However, as the cotton count system is still in use in the industry, these standards have been combined and up-dated on the basis of the experience gained during their use and the developments which have taken place after the publication of these standards.

0.3 To familiarize the industry with International System of Units (SI Units) the basic SI Units as well as the recommended SI Units for use in the textile industry are given in Appendix E.

0.4 In reporting the results 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 : 2-1960‡.

---

*Method for determination of lea breaking load (strength) of cotton yarn and its count-lea-strength product.

†Method for determination of skein breaking load (strength), tenacity and yarn strength index of cotton yarn (by constant-rate-of-traverse machine) (metric system).

‡Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard prescribes methods for determination of yarn strength parameters of yarns spun on cotton system using cotton count and tex system.

1.1.1 In cotton count system, determination of lea breaking load and count strength product (CSP) have been prescribed and in the metric system, determination of skein breaking load, yarn strength index (YSI) and skein breaking tenacity (SBT) have been prescribed.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply and for definitions of other terms IS : 232-1966* may be referred.

2.1 Breaking Load — The maximum load (or force) supported by a specimen in a tensile test carried to rupture. It is commonly expressed in grams or kilograms.

2.2 Cotton Count — The linear density expressed as number of 768·1 m hanks per 453·6 g (840 yd hanks/lb) of yarn.

2.3 Count Strength Product (CSP) — The product of the breaking load in pounds of a lea of yarn and its count (cotton count).

2.4 Skein — A continuous length of yarn in the form of a coil made on a reel of known girth. Usually 109·73 m (120 yd) skein made on 1·372 m (1·5 yd) girth reel is in use in cotton count system and is called 'lea'; while skeins of 100 and 50 m made on 1 m girth reel are in use in tex system.

2.5 Skein Breaking Tenacity (SBT) — The breaking load, in grams, of a 50 m skein divided by the linear density of unstrained yarn in tex and number of strands in the skein, that is, 100. It is expressed in grams per tex.

2.6 Yarn Strength Index (YSI) — The breaking load, in grams, of a 100 m skein divided by the linear density of unstrained yarn in tex.

2.7 Tex — The linear density expressed as number of grams per kilometre of yarn. This is a primary unit in a system (*see* Note) of units for expressing the universal count of yarn.

NOTE — This system is also intended to be used for expressing the mass per unit length of fibres, yarns and other textile products like ropes and rovings. The following multiple and sub-multiple units may be used to avoid large numbers and small fractions, respectively:

1 ktex (kilotex)	= 1 000 tex
1 mtex (millitex)	= 0·001 tex
1 dtex (decitex)	= 0·1 tex

*Glossary of textile terms — natural fibres (*first revision*).

3. SAMPLING

3.1 The samples shall be drawn in accordance with the procedure laid down in IS : 3920-1966*.

4. ATMOSPHERIC CONDITIONS FOR CONDITIONING AND TESTING

4.1 The samples shall be conditioned to moisture equilibrium in standard atmosphere of 65 ± 2 percent relative humidity and 27 ± 2°C temperature (*see also* IS : 6359-1971†).

4.2 The test shall be carried out in the standard atmosphere (*see* **4.1**).

5. APPARATUS

5.1 Testing Machine — a skein breaking load testing machine working on constant-rate-of-traverse (CRT) principle. Its rate of traverse shall be 300 ± 15 mm/min and the load range of the machine shall be such that the observed values would lie between 10 and 90 percent of the full scale load. The permissible error in the machine at any point in this range shall not exceed ±1 percent.

5.1.1 The machine shall be provided with the following arrangements:

a) Two pulleys or hooks for holding the skein with sufficient space to allow the even distribution of threads without much overlapping.

b) Means for adjusting distance between the pulleys or hooks.

c) A scale or dial or autograph recording chart graduated so as to give load in kilograms.

5.2 Wrap-Reel — having a girth of 1·372 m (1·5 yd) or 1 m and capable of reeling known length of yarn (*see* Appendix A).

5.3 Yarn Tensioning Device — an adjustable tensioning device capable of giving a reeling tension that will result in skeins of the specified length when measured on a skein gauge. The adjustment in reeling tension may be made, for example, by making more than one wrap around thread guides or by passing the yarn around tensioning bars. The reeling tension shall be the same at all reeling positions and may be checked as follows:

The yarn is wound from the same package at different reeling positions. The length of the skeins when measured on a skein gauge shall not differ by more than 0·1 percent.

5.4 Skein Gauge — a gauge for checking the length of the skein under a load of 0·5 gf/tex (5 mN/tex) and expressing the length as a plus or minus deviation from the nominal length. The sensitivity of the skein gauge shall be sufficient to permit rejection of skeins falling outside

*Methods for sampling of cotton yarn for determination of physical characteristics.
†Method for conditioning of textiles.

±0·25 percent tolerances. The skein-gauge length may be adjustable or non-adjustable. A non-adjustable skein gauge can be used when its nominal length differs by no more than 0·4 percent from the measured perimeter of the reel.

NOTE — For details of skein gauge, *see* Appendix B.

6. PREPARATION OF TEST SPECIMENS

6.1 Prepare skeins of 109·73 m (120 yd), 100 m or 50 m as required, following the procedure as described in Appendix A.

6.2 Prepare at least 30 test specimens and condition them as in **4.**

7. PROCEDURE

7.1 Bring pulleys or the hooks of the testing machine to the zero position. Take the conditioned skein of yarn and fix it on the pulleys or hooks. Carefully separate the yarn on the pulleys or hooks to avoid the individual strands overlapping each other.

7.2 Start the machine and carry the test to rupture. Record the skein breaking load in kilograms as indicated on the scale, dial or recording chart.

7.3 Determine the mass in grams of the broken skein and calculate the linear density of yarn in cotton count or tex system (as the case may be) (*see* IS : 1315-1977*).

7.4 Determine the skein breaking load and linear density of yarn of the remaining specimens following the procedure as laid down in **7.3.**

8. CALCULATIONS

8.1 Calculate the average breaking load and average linear density of all the observations taken (*see* **7.2**, **7.3** and **7.4**).

8.1.1 Calculate the coefficient of variation (CV) of all the breaking load values taken.

8.2 Cotton Count System

8.2.1 *Count Strength Product* (*CSP*) — Calculate the count strength product or count strength product corrected to nominal count, correct to a whole number, from the following formulae:

a) CSP $= L_1 \times N_e$

*Method for determination of linear density of yarns spun on cotton system (*first revision*).

b) CSP (Corrected) = $L_{1c} \times N_e'$

where

L_1 = average breaking load, in pounds (kg × 2·2), of the lea (*see* **8.1**);

N_e = average cotton count (*see* **8.1**);

L_{1c} = average breaking load, in pounds (kg × 2·2), corrected to nominal count (*see* Appendix C); and

N_e' = nominal cotton count.

8.3 Tex System

8.3.1 *Skein Breaking Tenacity (SBT)* — Calculate the tenacity or tenacity of yarn corrected to nominal linear density, correct to one decimal place, by the following formulae:

a) SBT in grams per tex = $\frac{L_2 \times 1\,000}{t \times 2 \times 50} = \frac{L_2 \times 10}{t}$

b) SBT (Corrected) = $\frac{L_{2c} \times 10}{t'}$

where

L_2 = average breaking load of 50 m skein, in kg (*see* **8.1**);

t = average linear density of yarn, in tex (*see* **8.1**);

L_{2c} = average breaking load of 50 m skein, in kg, corrected to nominal linear density (*see* Appendix C); and

t' = nominal linear density, in tex.

8.3.2 *Yarn Strength Index (YSI)* — Calculate the yarn strength index or yarn strength index corrected to nominal linear density, correct to a whole number by the following formulae:

a) YSI = $\frac{L_3 \times 1\,000}{t}$

b) YSI (Corrected) = $\frac{L_{3c} \times 1\,000}{t'}$

where

L_3 = average breaking load of 100 m skein, in kg (*see* **8.1**);

t = average linear density of yarn, in tex (*see* **8.1**);

L_{3c} = average breaking load of 100 m skein, in kg, corrected to nominal linear density (*see* Appendix C); and

t' = nominal linear density, in tex.

NOTE — It has been found that for a given yarn, the Yarn Strength Index and Count Strength Product are numerically the same for all practical purposes. However, to calculate the yarn strength index of a skein from the count strength product of a lea (or vice versa), the specified, observed or calculated breaking load value of the skein shall be converted into breaking load value of a lea (or vice versa), using the formula given in Appendix D.

9. REPORT

9.1 The report shall include the following information:

a) Type of material;

b) Number of specimens tested;

c) Breaking load of skein [109·73 m (120 yds) 50 m or 100 m];

OR

Breaking load of skein corrected to nominal count/linear density;

d) Coefficient of variation (CV) of breaking load values;

e) Count strength product (CSP)/Count strength product (CSP) corrected to nominal count (correct to a whole number);

OR

Yarn strength index (YSI)/Yarn strength index (YSI) corrected to nominal linear density (correct to a whole number);

OR

Skein breaking tenacity (SBT)/Skein breaking tenacity (SBT) corrected to nominal linear density (correct to a whole number).

APPENDIX A

(*Clauses* 5.2 *and* 6.1)

PREPARATION OF SKEINS

A-1. APPARATUS

A-1.1 A wrap reel having a girth of 1·372 m (1·5 yd) or 1 m shall be used to reel off the skeins. The wrap reel shall be fitted with thread guides fixed on a horizontal bar which has a traverse of about 25 mm. The wrap reel shall also be provided with a counting device to indicate

the length of yarn reeled out and a bell to ring just before the last revolution or a reel that automatically stops after the required number of revolutions.

A-2. PROCEDURE

A-2.1 Mount a test package on the wrap reel. Pass the end through the thread guides taking care that the yarn shall be kept under sufficient tension to avoid kinks, curls and slack in the yarn on the one hand and stretch on the other (*see* Note) and lead it to the reel.

NOTE — If necessary, the yarn may be wound full one turn around the thread guide.

A-2.2 Start the wrap reel. Running it at uniform speed, reel out a skein of required length. Cut and tie the trailing end of the skein to its leading end.

APPENDIX B

(*Note under clause* 5.4)

SKEIN GAUGE

B-1. APPARATUS

B-1.1 The gauge consists essentially of two round metal pegs of about 1·25 cm diameter and 5 to 6 cm long, located in the same vertical plane. One of the pegs is fixed to the rigid frame of the instrument and the other is carried on the lever of a simple loading system, the fulcrum of which is a low-friction bearing, which is also carried on the frame. At least one of the pegs should be free to rotate about its axis.

B-2. PROCEDURE

B-2.1 Place the skein without bunching, around the two pegs, and apply the appropriate load, for example, by hanging a weight on the end of the lever arm or by moving a sliding weight along the lever arm. The girth of the skein is indicated on a scale attached to the frame of the instrument, by a pointer attached to the lever arm or by an index line on the end of the lever arm. If L is the actual girth of the wrap reel, d the diameter of the pegs, and D the distance between the axes of the pegs when the indicator registers on the scale the actual girth of the wrap reel, then:

$$D = \frac{L}{2} - \frac{\pi d}{2}$$

APPENDIX C

(*Clauses* 8.2.1, 8.3.1 *and* 8.3.2)

CORRECTION FOR NOMINAL YARN COUNT/LINEAR DENSITY

C-1. To obtain the average breaking load corrected to nominal yarn count or linear density, use the following procedure.

C-1.1 Arrange the values of linear density and the corresponding breaking load of all the observations as obtained in **7**, in the ascending order of the yarn count/linear density.

C-1.2 Find the average linear density and the average breaking load of:

	Indirect System		*Direct System*		
				50 m skein	*100 m skein*
The first three skeins	Ne_1	L_1'	t_1	L_2'	L_3'
The last three skeins	Ne_2	L_1''	t_2	L_2''	L_3''
All the skeins	Ne	L_1	t	L_2	L_3

C-1.3 Calculations

a) $K_1 = \frac{L_1' - L_1''}{Ne_2 - Ne_1}$

b) K_2 (50 m skein) $= \frac{L_2'' - L_2'}{1/t_1 \quad 1/t_2}$

c) K_3 (100 m skein) $= \frac{L_3'' - L_3'}{1/t_1 \quad 1/t_2}$

C-1.4 Find the average breaking load corrected (L, L_{2c} or L_{3c}) to nominal count Ne' or to nominal linear density t', by the following formulae:

a) $L_{1c} = L_1 - K_1 (Ne' - Ne)$

b) $L_{2c} = L_2 - K_2 (1/t - 1/t')$

c) $L_{3c} = L_3 - K_3 \left(\frac{1}{t} - \frac{1}{t'} \right)$

APPENDIX D

(Note under clause 8.3.2)

CONVERSION OF BREAKING LOAD VALUES

D-1. To convert observed breaking load value, in lb, of a lea of 109·73 m (120 yd) into breaking load, in kg of a skein (100 m), use the following empirical formula:

$$L_1 = 0{\cdot}584\,8\,L_2 + 0{\cdot}500\,0$$

where

L_1 = breaking load, in kg, of skein made on a 1-m reel; and

L_2 = observed breaking load, in lb, of lea made on a $1\frac{1}{2}$-yd reel.

NOTE — The formula has been derived from the data collected at the Cotton Technological Research Laboratory (ICAR), Bombay on 77 samples of yarn of various counts ranging from 14s to 120s.

APPENDIX E

(*Clause* 0.3)

SI UNITS

TABLE 1 INTERNATIONAL SYSTEM OF UNITS

Base Units

Quantity	Unit	Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	Unit	Symbol
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	Unit	Symbol	Conversion
Force	newton	N	1 N = 0·101 972 kgf
Energy	joule	J	1 J = 1N.m
Power	watt	W	1 W = 1J/s
Flux	weber	Wb	1 Wb = 1V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1A/V
Pressure, stress	pascal	Pa	1 Pa = 1N/m^2

TABLE 2 RECOMMENDED SI UNITS FOR TEXTILES

Sl No.	Characteristic	SI Unit		Application
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
1)	Length	Millimetre	mm	Fibre
		Millimetre, centimetre	mm, cm	Samples and test specimens (as appropriate)
		Metre	m	Yarns, ropes and cordages, fabrics
2)	Width	Millimetre	mm	Narrow fabrics
		Centimetre	cm	Other fabrics
		Millimetre, centimetre	mm, cm	Samples and test specimen (as appropriate)
		Centimetre, metre	cm, m	Carpets, druggets, durries (as appropriate)
3)	Thickness	Micrometre (micron)	μm	Delicate fabrics
		Millimetre	mm	Other fabrics, carpets, felts
4)	Linear density	Tex	tex	Yarns
		Millitex	mtex	Fibres
		Decitex	dtex	Filament and filament yarns
		Kilotex	ktex	Slivers, ropes and cordages
5)	Diameter	Micrometre (micron)	μm	Fibres
		Millimetre	mm	Yarns, ropes, cordages
6)	Circumference	Millimetre	mm	Ropes, cordages
7)	Threads in cloth:			Woven fabrics (as appropriate)
	a) Length	Number per centimetre	ends/cm	
		Number per decimetre	ends/dm	
	b) Width	Number per centimetre	picks/cm	
		Number per decimetre	picks/dm	
8)	Warp threads in loom	Number per centimetre	ends/cm	Reeds
9)	Stitches in cloth:			Knitted fabrics (as appropriate)
	a) Length	Number per centimetre	courses/cm	
		Number per decimetre	courses /dm	
	b) Width	Number per centimetre	wales/cm	
		Number per decimetre	wales/dm	
10)	Stitch length	Millimetre	mm	Knitted fabrics Made-up fabrics

(*Continued*)

TABLE 2 RECOMMENDED SI UNITS FOR TEXTILES — *Contd*

Sl No.	Characteristic	SI Unit		Application
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
11)	Mass per unit area	Grams per square metre	g/m^2	Fabrics
12)	Mass per unit length	Grams per metre	gm	Fabrics
13)	Twist	Turns per centimetre Turns per metre	turns/cm turns/m	Yarns, ropes (as appropriate)
14)	Test or gauge length	Millimetre, centimetre	mm, cm	Fibres, yarns and fabric specimens (as appropriate)
15)	Breaking load	Millinewton	mN	Fibres, delicate yarns (skeins or individual)
		Newton	N	Strong yarns (individual or skeins), ropes and cordages, fabrics
16)	Breaking length	Kilometre	km	Yarns
17)	Tenacity	Millinewton per tex	mN/tex	Fibres, yarns (individual or skeins)
18)	Twist factor or twist multiplier	Turns per centimetre × square root of tex	turns/cm $\sqrt[x]{\text{tex}}$	Yarns (as appropriate)
		Turns per metre × square root of tex	turns/m $\sqrt[x]{\text{tex}}$	
19)	Bursting strength	Newton per square centimetre	N/cm^2	Fabrics
20)	Tear strength	Millinewton	mN	Fabrics (as appropriate)
		Newton	N	
21)	Pile height	Millimetre	mm	Carpets
22)	Pile density	Mass of pile yarn in grams per square metre per millimetre pile height	g/m^2/mm pile height	Pile carpet
23)	Elastic modulus	Millinewton per tex per unit deformation	mN/tex/unit deformation	Fibres, yarns, strands

INDIAN STANDARDS

ON

PHYSICAL METHODS OF TEST

IS:

234-1973	Linear density of textile fibres (gravimetric method) (*first revision*)
235-1954	Mean single fibre-strength and intrinsic strength (cotton)
236-1968	Cotton fibre maturity (by sodium hydroxide swelling method) (*first revision*)
684-1962	Nep count in cotton
832-1964	Twist in yarn
1315-1977	Linear density of yarns spun on cotton system (*first revision*)
1611-1960	Cotton fibre immaturity count-polarized-light method
1670-1970	Breaking load, elongation at break and tenacity of yarns (*first revision*) (*superseding* IS : 569-1964 and IS : 685-1962)
1954-1969	Length and width of fabrics (*first revision*)
1963-1969	Threads per decimetre in woven fabrics (*first revision*)
1964-1970	Weight per square metre and weight per linear metre of fabrics (*first revision*)
1966-1975	Bursting strength and bursting distension of fabrics: diaphragm method (*first revision*)
1969-1968	Breaking load and elongation at break of woven textile fabrics (*first revision*)
3442-1966	Crimp and count of yarn removed from fabrics
3674-1966	Micronaire value of cotton fibres
3675-1966	Bundle strength (tenacity) of cotton fibres
3689-1966	Conversion factors and conversion tables for yarn count
4681-1968	Wrinkle recovery of fabrics (by measuring crease recovery angle)
4871-1968	Lint and trash content of cotton by means of mechanical-pneumatic machines
6359-1971	Conditioning of textiles
6489-1971	Tear strength of woven textile fabrics by elmendorf tester
6490-1971	Stiffness of fabrics — cantilever test
6668-1972	Preparing test specimens from fabric samples for physical tests
7702-1975	Thickness of woven and knitted fabrics

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephone : 27 01 31 (20 lines) **Telegrams : Manaksanstha**

Regional Offices :		Telephone
Western : Novelty Chambers, Grant Road	BOMBAY 400007	37 97 29
Eastern : 5 Chowringhee Approach	CALCUTTA 700072	23-08 02
Southern : C. I. T. Campus, Adyar	MADRAS 600020	41 24 42
Branch Offices :		
'Pushpak', Nurmohamed Shaikh Marg, Khanpur	AHMADABAD 380001	2 03 91
'F' Block, Unity Bldg, Narasimharaja Square	BANGALORE 560002	2 76 49
Showhouse Bldg, Sachivalaya Marg	BHUBANESHWAR 751001	5 36 27
Ahimsa Bldg, SCO 82-83, Sector 17C	CHANDIGARH 160017	2 83 20
5-8-56/57 L. N. Gupta Marg	HYDERABAD 500001	22 10 83
D-277 Todarmal Marg, Banipark	JAIPUR 302006	7 63 16
117/418 B Sarvodaya Nagar	KANPUR 208005	82 72
B. C. I. Bldg (3rd Floor), Gandhi Maidan East	PATNA 800004	5 36 55
Hantex Bldg (2nd Floor), Rly Station Road	TRIVANDRUM 695001	32 27

Printed at New India Printing Press, Khurja, India