

# COMPARING CIS COTTON WITH INDIAN COTTON IN RESPECT OF PERFORMANCE

A.N.M. Ahmed Ullah

Department of Textile Engineering, Southeast University, Dhaka-1208, Bangladesh

Corresponding Author Email: ullah\_text@yahoo.co.uk

## ABSTRACT

In yarn making process different origin of cotton fibres are used in Bangladesh & most of the fibres (approximately 98%) are imported from abroad as there is a huge gap of cotton fibre production & cotton yarn consumption ultimately cotton fabric consumption in the country. In the experiment C.I.S & Indian origin cotton fibres were used & these fibres processed in Blow Room, Carding, Drawing, Simplex & Ring frame. Several experiments were carried out with C.I.S. & Indian cotton of 1 7/8" staple length for producing 30/1<sup>s</sup> carded (Knitted) yarn. It is observed that yarn made from C.I.S fibres is more suitable than Indian cotton for making knitted yarn.

**Key words:** C.I.S. cotton, Maturity, strength, Staple length, Elongation & Neps .

## 1. Introduction

Cotton is a natural cellulosic fibre. It has got the very good spin-able characteristics, like strength, soft in handle, absorbent, colour retention, easy handle, and Good heat conductor, Because of its excellent properties cotton fibres kept its popularity from the ancient time. It is the basic resource for wide variety of consumers throughout the world. The contribution & importance of cotton fibres are growing day by day. Now a days the environmental issues makes its position to the peak in comparison to other fibres.

Cotton is known as the 'white gold' because by selling cotton fibres countries produced, sales earned huge dollar/gold. Different types of cotton are grown in various parts of the world. Variations occur because of growth conditions including factors such as climate, fertilizers & pests. The quality of cotton fibre is based on its colour, staple length, fineness & strength. Usually longer the fibres are finer & stronger. The cotton is normally identified by geographical area or name of the country where it is produced. There are 3 types of cotton are grown in the world though commercially many species of cotton can be found.

### Type-1:

Average fibre length varying from 25-60 mm including high quality fine cotton fibre e.g. Egyptian, Sea island & Sudanese varieties.

### Type-2

Medium staple length American upland cotton is one of the varieties of this kind, Bulk crop is found from this type, Average staple length is 13-32 mm.

### Type-3

Shorter staple length approximately 9-25 mm, which is found in various Asian countries, mostly China, India, Pakistan; and also in CIS, USA.

Table-1 HVI & AFIS Results

Type	Indian 70% + Zimbabwe 30%		CIS 70% + Zimbabwe 30%	
<b>HVI Result</b>				
UHML	28.30	28.40	28.90	28.40
Uniformity Index%	83.00	82.60	83.70	82.60
SFI	6.40	5.90	4.80	5.90
MIC	5.00	4.30	4.80	4.30
Strength (gm/tex)	30.50	30.90	31.90	30.90
Elongation%	4.25	4.28	4.4	4.28
SCI	132	140	147	140
Maturity	0.88	0.88	0.90	0.88
<b>AFIS Results</b>				
UQLW(mm)	28.8	29.0	28.95	29.0
SFCW%	7.3	7.4	7.2	7.4
SFCn%	20.5	20.6	20.4	20.6
Neps (cnt/gm)	200	195	190	195

Call for Paper will be Open soon!  
Textile Research Conference 2015

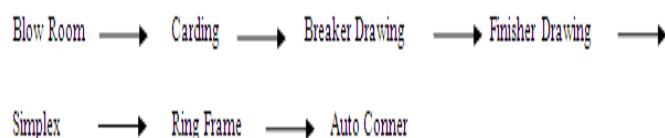
**Table -2 Comparisons of Technical Parameters**

Name of fibre	C.I.S. 70%+Zimbabwe 30%	Indian 70%+Zimbabwe 30%
Name of M/C		
Blow Room line	Trutzschler	Trutzschler
Carding	Trutzschler DK-760	Trutzschler DK-760
Delivery Speed (m/minute)	160	160
Grains/yd	68	68
Breaker Drawing	Toyoda DYH600C	Toyoda DYH600C
Delivery Speed (m/minute)	470	470
Grains/yd	68	68
Finisher Drawing	Toyoda DT100 LT	Toyoda DT100 LT
Delivery Speed (m/minute)	400	400
Grains/yd	68	68
Simplex	Toyoda FL-16	Toyoda FL-16
Flyer Speed (RPM)	1150	1150
Roving hank	0.74	0.74
Roving T.P.I	1.10	1.10
Ring	Shanghai FA 507A	Shanghai FA-507A
Avg. Spl. Speed (RPM)	15750	15750
Yarn T.P.I	20.5	20.5
Efficiency	0.94	0.94
OPS	6.2	6.2
Winding	Murata 7-V	Murata 7-V
Delivery Speed (m/minute)	1400	1400
Eye Settings		
N	SE:400	SE:400
S	SE:180 RL:2	SE:180 RL:2
L	SE:40 RL:30	SE:40 RL:30
T	SE:40 RL:30	SE:40 RL:30

## Materials & Methods

This research work was carried out at Beximco Textile Mills (Padma) Ltd. Gazipur. CIS & Indian origin cotton of 1 7/8" staple lengths were taken as the major raw materials for the experiment. The other minor raw material used in the experiment is Zimbabwe 1 1/8" Staple length cotton. The Indian & CIS fibres were tested in HVI & AFIS machines and the results are given in table 1.

The experiments were done for comparative study of 30/1<sup>s</sup> carded yarn made from C.I.S & Indian origin cotton. Both the fibres were processed in Trutzschler Blow Room, Carding, Toyoda drawing, Toyoda simplex, Shanghai Ring Frame & Murata Auto Conner machines. The delivery speed, Grains/yd. of sliver, Roving hank, and T.P.I spindle speed may be seen from the table -2 The Process Flow diagram is presented below:



For meeting the buyer requirements fiber properties and yarn parameters for knitted yarn are recommended as follows in tables 3 &4.

**Table 3 Fibre Properties**

1	Length	27.5-29.0 mm
2	Fineness	Mic 3.9-5.2
3	Maturity	0.88-0.94
4	Strength	20-22 GPT
5	Color grade	white, light spotted, spotted
6	Short fiber index	5.0-8.0
7	SCI	130-140

**Table 4: Knitted Yarn Parameters**

1	Count CVt%	<1.8%
2	Breaking tenacity	>10 cN/Tex
3	Elongation	>5%
4	Hairiness	>50% value of the Uster Statistics
5	Hairiness CV%	<7%
6	Yarn Irregularity	<25% value of the Uster Statistics
7	Classimat Values	A3 + B3 + C2 + D2 = <5/100000 meter

**RESULTS**

The results are presented in tables 5, 6 & 7.

Yarn Lot	Indian	CIS
Avg. Count	30.10	30.18
Count CVt%	1.41	1.23
T.P.I	24.50	24.50
Uster Um (%)	12.22	11.55
Uster CVm (%)	14.96	14.73
Thin/km (-50%)	11	8
Thick/km (+50%)	227	185
Neps/km (+200%)	307	278
Hairiness (-)	4.41	4.35
Tenacity (cN/tex)	16.63	17.12
Elongation (%)	3.64	3.82

Yarn Lot	Indian	C.I.S
Avg. Count	30.13	30.22
Count CVt(%)	1.34	1.30
T.P.I	24.15	24.50
Uster Um (%)	12.51	11.65
Uster CVm (%)	15.79	14.82
Thin/km (-50%)	13	9
Thick/km (+50%)	224	142
Neps/km(+200%)	358	310
Hairiness (-)	5.83	5.34
Tenacity (cN/tex)	17.22	18.34
Elongation (%)	4.37	4.43

**Discussions:**

From table-5 (Ring Yarn Quality) it is seen that Count CVt%, Uster, Thick places, Thin places, Hairiness and Neps of Indian dominated yarn are more than CIS dominated yarn but Tenacity and Elongation of Indian yarn are less than CIS yarn.

From table-6 (Cone Yarn Quality) it is clearly understood that Count CVt%, Uster, Thick places, Thin places, Hairiness and Neps of Indian dominated yarn are more than CIS dominated yarn but Tenacity and Elongation of Indian yarn are less than CIS yarn.

Type	Indian	C.I.S
A1	83	76
A2	7.8	5.8
A3	1.1	0.4
A4	0.0	0.0
B1	24	18
B2	6.3	2.2
B3	0.0	0.0
B4	0.0	0.0
C1	3.8	2.9
C2	1.9	0.9
C3	0.0	0.0
C4	0.0	0.0
D1	0.0	0.0
D2	0.0	0.0
D3	0.0	0.0
D4	0.0	0.0
E	0.0	0.0
F	0.0	0.0
G	0.0	0.0
H1	28	23
H2	3.3	0.0
I1	0.3	0.0
I2	0.9	0.0

Higher thick and thin places or lump in yarn causes more end breaks in the ensuing processes, damaged fabric appearance, poor knitting performance and shade variation in dyed fabrics. There must be no weak or thick places which can result in stops, holes in the knitted material or even broken needles. Particularly important is the ability of the yarn to pass easily through the various guide elements of the machine.

In case of single jersey materials, yarn evenness and count variation, both the short and medium term as well as long term count variations, lead to cloudy or stripy fabrics as soon as a certain mass variation level is over stepped.

**Call for Paper will be Open soon!**  
**Textile Research Conference 2015**

Protrusion of fiber ends from the main yarn structure causes more end-breaks in winding, uneven fabric surface and beads formation in the fabric.

Neppy yarn, vegetable matter as well as high dust content refer to the types of foreign matter which are particularly disturbing. These lead to wear of the needles, holes in the knitted materials and in many cases damage the fabric appearance and causes dyeing problem.

Higher Classimat values causes a cloudy appearance in a knitted fabric.

### Conclusion:

It can be concluded from the above that Indian cotton fiber and yarns have more short comings than that of CIS ones. Though the price of Indian cotton is less than the price of CIS cotton and location-wise India is nearer to Bangladesh, CIS cottons are preferably being used mostly in knitted yarn production for its better productivity.

### Reference:

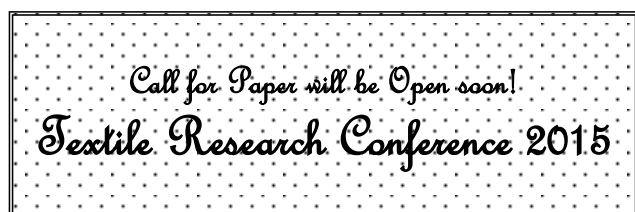
[1] Islam, A.; Mohiuddin, M (2006); "Fibre and Yarn Quality for knitting fabrics", paper presented in *International Centre for Textile Management*, 2006

[2] Booth, J.E (1982), "Principles of Textile Testing", Heywood books, London, p 121-365

[3] Goswami, B.C., Martindale J.G and Scardino F.L. (1977), "Textile Yarns, Technology structure and applications," John Wiley & Sons Inc, Canada, p 96-219

[4] Morton, W.E and Hearle JWS (1962), "Physical Properties of textile fibre", The Textile Institute, Manchester, UK, p.122.

[5] Rashid, M.R., Ahmed, F., Azad, A.K and Ullah, ANMA, "Comparative Study on Cotton Yarn Quality Made from Compact and Conventional Ring Frame"; *Journal of Innovation & Development Strategy (JIDs)*, Vol. 5, Issue 3, Dec 2011.



## TEXTILE RESEARCH CONFERENCE (TRC), 16 AUGUST 2014

### Technical Session 1: Textile Materials & Composite [9:30am to 11:00am]

Session Chair:

Prof. Dr. Md. Mahbubul Haque,  
Daffodil International University

Co-Chair:

Prof. Dr. Ahmed Jalal Uddin,  
Ahsanullah University of Science & Tech

### \*Technical Session 2: Textile Chemistry & Environmental Sustainability [11:15am to 12:45pm]

Session Chair:

Prof. Dr. Mustafizur Rahman,  
Ahsanullah Uni of Science & Tech

Co-Chair:

Dr. Md. Mashiur Rahman Khan,  
Bangladesh University of Textiles

### \*Plenary Session & Technical Session 3 [2:30pm to 4:00pm]

Chief Guest:

Prof. Dr. Nitai Chandra Sutradhar,  
Hon'ble Vice Chancellor, BUTEX

Special Guest 1:

Engr. MS Zaman, President ITET  
& MD, Microfibre Group

Special Guest 2:

Prof. Syed Fakhru Hasan,  
Dean (SSE), Southeast University

Session Chair:

Prof. Dr. Md. Zulhash Uddin,  
Bangladesh University of Textiles

[www.clothinginstitute.org](http://www.clothinginstitute.org)