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Welcome to Review Of Research

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Review Of Research

PHYSICAL CHARACTERISTICS OF COTTON /POLYESTER CORE SPUN YARN PREPARED ON RING FRAME

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ABSTRACT:

Manufacture of yarn from Polyester-cotton core yarn is one of the most important developments in textile Industry. Use of core yarns is mainly aimed to improve the strength, comfort, durability, aesthetic and other functional properties of the final yarn.
The article reports the results

of investigation on core spun yarns made from polyester filament as core and cotton as sheath material. Polyester filaments in different proportions were chosen for the core component and cotton as a sheath for the preparation of the final yarn. Total twelve different yarns were made on ring frame and Air jet machine. The results were compared with 100% cotton Ring Spun yarn.
It is observed that core yarns are having improved physical properties like strength uniformity etc. over that of 100% cotton ring spun yarn.

KEY WORDS: *Polyster Spun Yarn, Textile industry.*

1. INTRODUCTION:

Core yarn structure consists of two components, one of which forms the center axis or core of the yarn and other is the covering. Continuous multifilament yarn generally used as a core while cotton staple fibers are used for covering the filaments or used as sheath material to improve the

comfort property of the yarn.

Core spun yarn shows some improved characteristics over 100% spun staple yarn. To improve

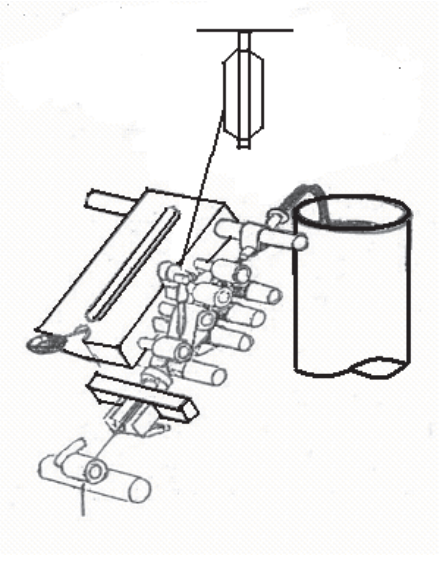


Fig.2 Cc

3. RESULTS & DISSECTIOI

Total six core yai and six core yarn were prepared on Murata Air red and The results were compared with 100% cc nt strength products of different yarns were teste and shown in Table no 1. RKM values, Single yarı s were tested on uster dyanamate Ut3 model an

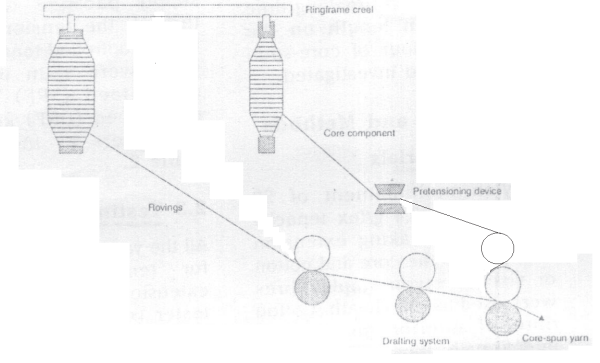


Table no 1. U%, Thick, Thin ,Neps were tested on uster evenness testing machine UT4 model and results were shown in Table no 2.

Core yarn code	Details of core yarn
a	30/24 drawn polyester/cotton core yarn prepared on ring frame spinning
b	30/24 crimped polyester/cotton core yarn prepared on ring frame spinning
e	30/24 drawn polyester/cotton core yarn prepared on air jet spinning
f	30/24 crimped polyester/cotton core yarn prepared on air jet spinning
i	44/36 drawn polyester/cotton core yarn prepared on ring frame spinning
j	44/36 crimped polyester/cotton core yarn prepared on ring frame spinning
m	44/36 drawn polyester/cotton core yarn prepared on air jet spinning
n	44/36 crimped polyester/cotton core yarn prepared on air jet spinning
q	70/36 drawn polyester/cotton core yarn prepared on ring frame spinning
r	70/36 crimped polyester/cotton core yarn prepared on ring frame spinning
u	70/36 drawn polyester/cotton core yarn prepared on air jet spinning
v	70/36 crimped polyester/cotton core yarn prepared on air jet spinning
y	100% cotton yarn produced on ring frame spinning

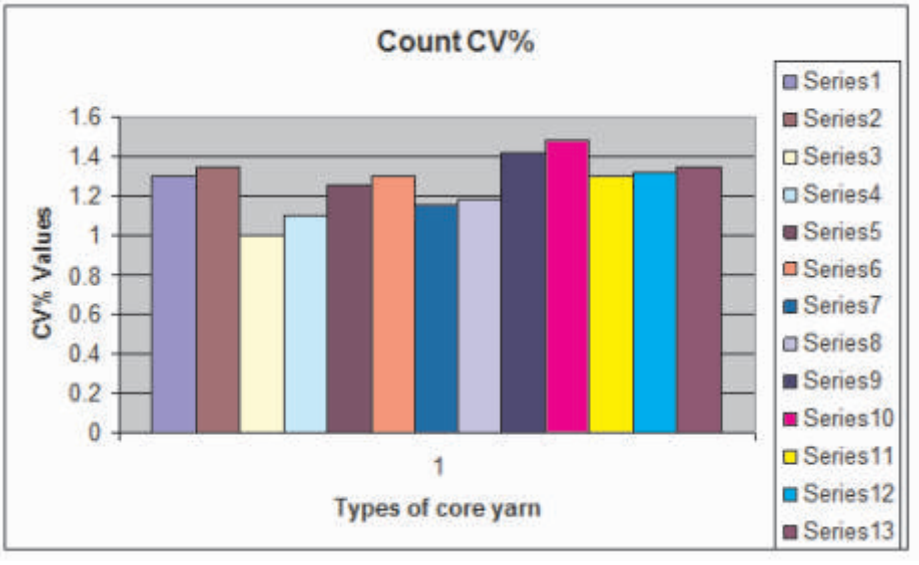
	Particulars of filament at the core	a 30/24D Drawn	b 30/24D Crimped	e 30/24D Drawn	f 30/24D Crimped	i 44/36D Drawn	j 44/36D Crimped	m 44/36D Drawn	n 44/3D Crimped	q 70/3D Drawn	r 70/36D Crimped	u 70/3D Drawn	v 70/3D Crimped	y 100% cotton
1	Avg. Count (2/30Ne)	15.48	15.13	15.45	15.2	15.31	15.30	15.73	15.83	15.32	15.30	15.23	15.21	15.21
2	CountCV %	1.3	1.35	1.00	1.10	1.26	1.30	1.16	1.18	1.42	1.48	1.30	1.32	1.35
3	C. S. P.	3579	3780	2179	2379	3801	3850	2207	2379	3979	4125	2403	2608	2700
4	RKM	25.35	27.46	17.25	18.65	27.60	28.01	18.70	19.35	28.85	29.87	19.50	19.75	19.9
5	Single Yarn Strength (Gram)	350.1	360.2	210.1	225.1	435.1	438.06	305.1	300.1	610.83	613.64	360.1	395.1	300.2
6	Elongation %	23.3	22.9	6.089	5.34	27.64	21.69	10.3	9.73	34.57	33.57	23.48	20.48	4.5
7	Core sheath ratio	83/17 C/P	83/17 C/P	17/83 (P/C)	17/83 (P/C)	75/25 C/P	75/25 C/P	25/75 (P/C)	25/75 (P/C)	60/4 C/P	60/40 (P/C)	40/60 (P/C)	40/60 (P/C)	100% C

3 n a c fi

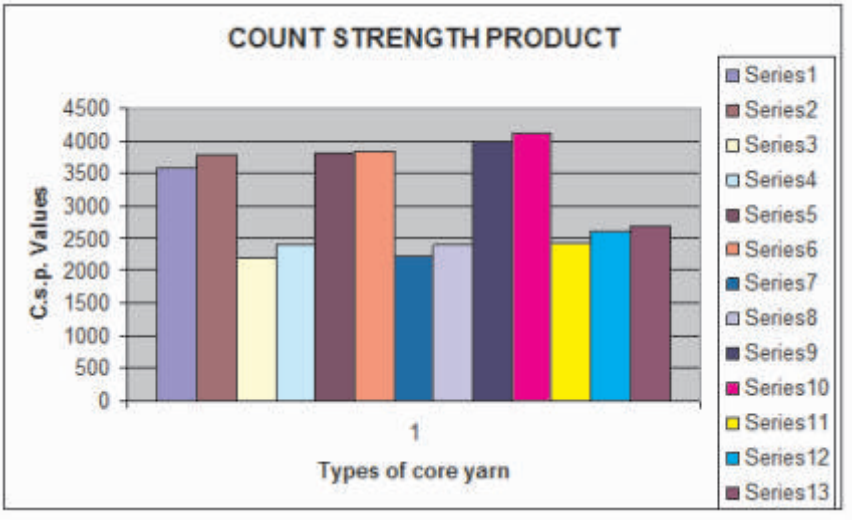
	Particulars	a 30/24D Drawn	30/24D Crimped	e 30/24D Drawn	f 30/24D Crimped	i 44/36D Drawn	j 44/36D Crimped	m 44/36D Drawn	n 44/36D Crimped	q 70/36D Drawn	r 70/36D Crimped	u 70/36D Drawn	v 70/36D Crimped	y 00% cott on
1	U %	8.47	8.64	7.63	7.72	8.5	9.0	7.83	7.95	9.01	9.25	7.93	7.98	7.93
2	Thin	10	8	0	0	6	7	0	0	5	8	0	0	0
3	Thick	62	48	12	15	28	53	18	16	28	30	23	21	23
4	Neps	108	87	23	25	66	55	27	24	63	76	37	34	37
5	Total Imperfection	143	180	35	40	90	115	45	40	96	114	60	55	60

3.2. Count Streng

Yarn lea st npared. It is found that as the s also found that by using crin ed. Graph 2 shows that in 40- e 1 it is also clear that using c use of more inter fibre friction duct of core yarn made from A



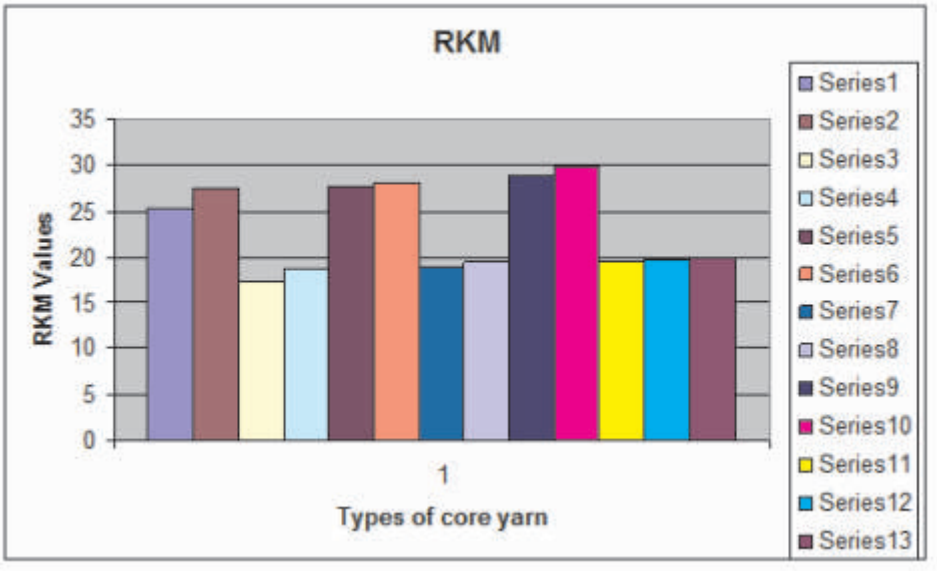
Graph 2. CSP values of different core spun polyester yarn.



3.3. RKM:-

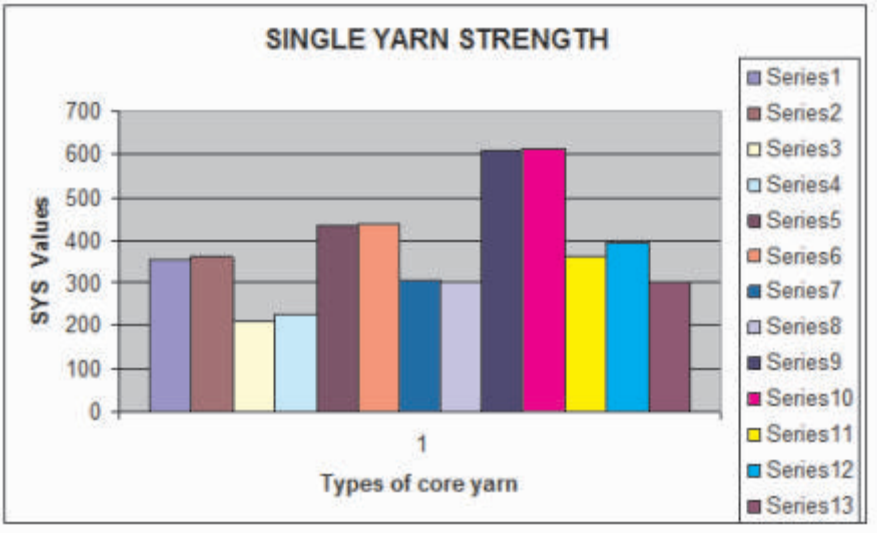
RKM values we in Table 1. It is observed that as % d. Increased values of RKM are also o because of more inter fibre cohesi as less RKM compare to core yarn n ning.

Gr



3.4. Single yarn

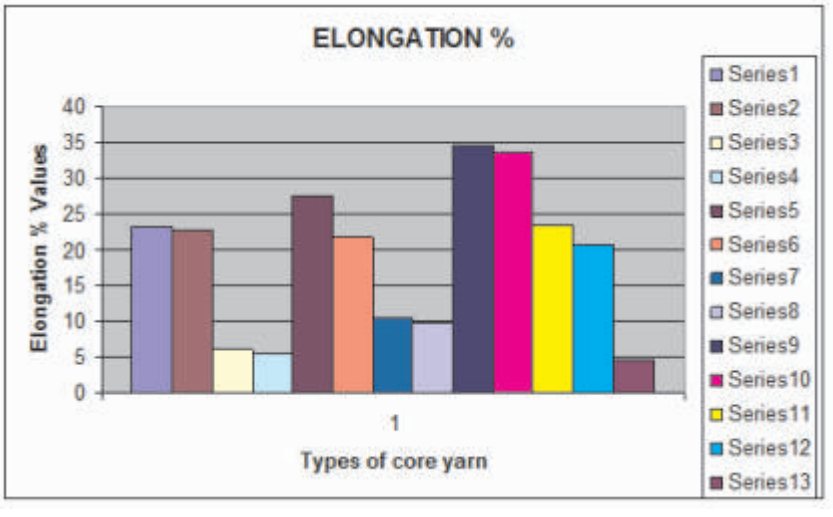
Single y d results are shown in Table the increase amount of filan ows greater strength than th ast strength. It is due to the crimped and drawn yarns use r strength.



3.5. Elongation % of

Elongation c core. When percentage in the co lepended on the type of core fila to 25%) the elongation is obser\ ncreased by further 15% (i.e. fror bserved that as compared to ring 400% higher with 30D core yarn) yarn at the core. It is due to sh rface cotton yarn breaks earlier. Therefore, it can be concluded that % increase of filament in the core shows increased elongation properties. Results also show that drawn yarn in the core shows more elongation property than the crimped yarn in the core. It is obvious that crimped filament yarns provide more friction with the cotton sheath fibres than that of the parallel drawn filament yarns for which extension is observed less with crimped yarn at the core.

Graph no 5 Elongation % of yarn



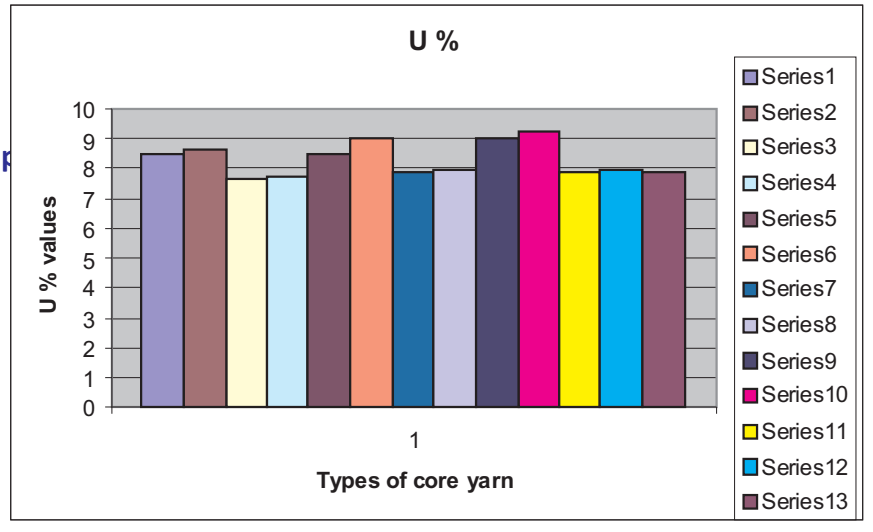
3.6. U% & Total imp

Uster evenr model and result are shown in table 2 mperfection than that of ring spun more uniform . Uniformity is more amount of staple fibers at the sheath ance contribution of core to sheath. It i.e. 7.63 and that of 100% ring spinni rn is least (17% at the core) the thick same value is in between 21-23 wh mped and drawn

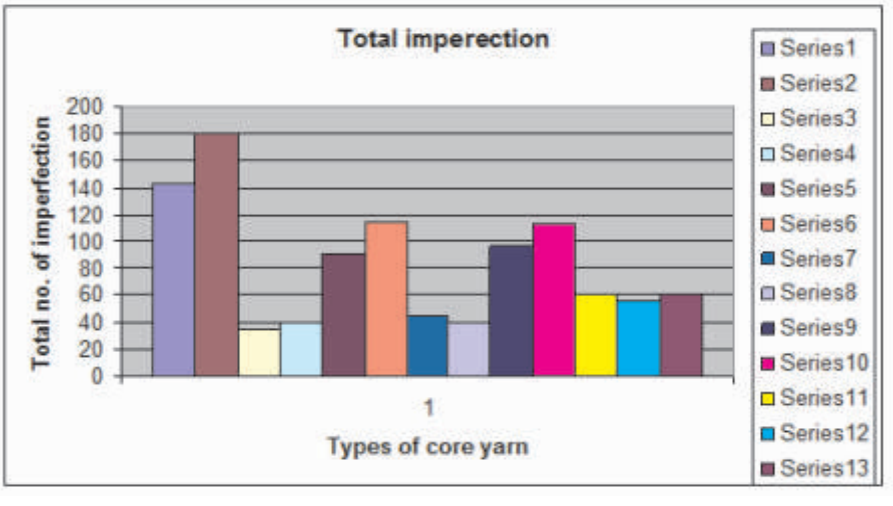
yarn does not show any clear trend .It is also seen that when the % of filament at the core is least Neps are also least in the core yarn. This is due to more wrapping of staple fibres around the filament yarns. Thin place do not show any specific trend.

As compared to ring core yarn air jet core spun yarn shows all round improvements in minimizing the yarn faults.

Graph 6. U% values of different core spun polyester yarn.



Grap



As compar ıe yarn faults because of presen so increasing the total imperfec tion with the cotton fibre.

3.7. Observation a

When all d n yarn (using 70D filament at th was used for weaving it is obser s due to non-dyeing of polyeste as minimized

drastically with 25% filaments at the core and with 17 % filament at the core no traces of white spots could be observed at the surface. It is therefore concluded that best covering of cotton was observed by 17% filament at the core. The matter can be cross checked by other dyeing procedures, but because of lack of timing of the project further investigations could not be done.

4. SUMMARY & CONCLUSION:

I. It is concluded that using filament yarn at the core improved tensile strength, Elongation, RKM values of the core yarns as compared to 100% ring spun yarn.
ii. When the amount of filaments are increased at the core in Ring spinning it is observed that U%, values are decreased in the resultant core yarn.
iii. Crimped fibres always show better yarn strength as compared to drawn filaments at the core. Where as the elongation property shows opposite trend.
iv. Drawn fibres at the core shows reducing yarn imperfection
v. As compare to ring frame core yarn the air jet core yarn has less strength but uniformity is better.
vi. It is concluded that using filament yarn at the core improved tensile strength, Elongation, RKM values of the core yarns are obtained as compared to 100% ring spun yarn.
vii. When the amount of filaments are increased at the core in air jet spinning it is observed that U%, Thick place & Neps values are increased in the resultant core yarn but when we compared with Ring spinning yarn the values obtained on air jet yarns are far at the lower side. 100% cotton spun yarn could not be obtained on air jet spinning because of mismatch staple length with the machine requirement. But the same fibres could be processed on the same air-jet machine using only a filament at the core and cotton at the sheath.
viii. Crimped fibres always show better yarn strength as compared to drawn filaments at the core. Where as the elongation property shows opposite trend.
ix. As compared to ring core yarn air jet core spun yarn shows all round improvements in minimizing the yarn faults.

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