

PRODUCT GUIDE

Chapter 15
Performance data



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Research and Development is a continuous process. Hence, some of the information provided in this PRODUCT GUIDE may have become obsolete with TeraSpin's new developments in technology.

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A.T.E. ENTERPRISES PRIVATE LIMITED

TeraSpin is a business unit of A.T.E. Enterprises Private Limited, a company engaged in the service of the textile industry since **1939**. TeraSpin came into existence in 2012 after A.T.E.'s takeover of SKF India's textile spinning component business. Since then it has been innovating and making continual improvements in quality and reliability in the service of spinning mills and machinery manufacturers around the world.

TeraSpin's product range consists of weighting arms, top rollers & cradles for roving frame and ring frame, spindle bearing units and complete spindles for ring frames and doubling frames. TeraSpin also offers customized upgrades for existing ring spinning and roving frames.

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Performance data of PKS 3220 weighting arm

Roving hank	Ne 1.6 x 2 (1 polyester & 1 cotton)
Yarn count	Ne 30s

	Existing pneumatic drafting	PK S 3220	% improvement
U%	10.08	9.68	3.97
C.V.%	3.67	1.92	47.68
-50%	1	0	100.00
+50%	85	67	21.18
+200%	140	132	5.71
Total IPI (Ring cop)	226	199	11.95
CSP (Cone)	2707	2787	2.96
Total IPI (Cone)	247	161	34.82
RKM (Cone)	70.74	70	-1.05
Total yarn faults	250	180	28.00
Winding cuts	55	52	5.45

Raw material	100% cotton
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Roving hank	Ne 1.1
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Yarn count	Ne 40 CCH
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Drafting	Existing Pneumatic P 3/1	TeraSpin PK S 3420	% improvement
Cradle	LMW 39 mm cradle	OH S 1681 (double spring)	
U%	9.8	9.37	4.39
-40%	46.3	29.4	36.50
-50%	0.6	0.4	33.33
+35%	246.9	129.5	47.55
+50%	20	12.7	36.50
+140%	302.6	217.2	28.22
+200%	60.6	53.1	12.38
Total IPI	81.2	66.2	18.47
Total high sensitivity IPI	595.8	376.1	36.87
Hairiness	3.66	3.76	-2.73

Roving Hank	Ne 1.0 (100% Cotton)
Yarn Count	46's K

Drafting	P 3-1	P 3-1	P 3-1	PK S 3220	% improvement		
Cradle	LMW 36 mm	LMW 39	Suessen 36 mm	OH S 1681	Compared to LMW 36 mm cradle	Compared to LMW 39 mm cradle	Compared to Suesen 36 mm cradle + pin spacer
Cradle Type	Fixed	Fixed	Active	Active			
Spacer	Yellow 3.25	Yellow 3.25	Suessen pin spacer 3.25	Lilac 2.5			
U%	16.59	15.02	14.53	14.15	14.7	5.79	2.6
Thin -50 %	285	117	102	75	73.7	35.90	26.5
Thick +50 %	1582	976	835	724	54.2	25.82	13.3
Neps +200 %	2263	1789	1776	1520	32.8	15.04	14.4
Total IPI	4130	2882	2713	2319	43.8	19.54	14.5
(-)40%	7778	6124	5598	5173	33.5	15.53	7.6
(+)35	3732	2810	2600	2157	42.2	23.24	17.0
(+)140%	6300	5542	5312	4842	23.1	12.63	8.8
Total	17810	14476	13510	12172	31.7	15.92	9.9

Roving Hank	Ne 1.9 (Re-cycled polyester)
Yarn Count	90's

Drafting	P 3-1	PK S 3220	% improvement
Cradle	LMW 36 mm	OH S 168	
CVm%	16.7	16.2	3.0
Thin -50 %	111	73	34.2
Thick +50 %	105	69	34.3
Neps +200 %	73	99	-35.6
Total IPI	289	241	16.6
Quantum online (All/100km)			
A1-G	5698.7	5102.1	10.5
H1-I2	20.4	16.7	18.1
C3-D4	31	28	9.7
A1-D1, E	5674.5	5082.1	10.4
GTS YF	282.1	279.2	1.0
YF cuts/100km @SEW	84.3	48.5	42.5
S cuts	60.3	28.9	52.1
L cuts	11.1	8.6	22.5

Performance data of PKS 3225 weighting arm

Raw material	P/V (Dyed)
Blend proportion	70/30
Fibre length	44 mm
Denier	1.4

Roving hank	Ne 1.5
TPI	1.07

Yarn count	Ne 50
TPI	23.7

Ring frame	LMW LR 6/S
Cradle	Medium

	Existing Pneumatic P 3/1	TeraSpin PK S 3420	% improvement
Cradle	LMW Medium cradle (Polymer)	OH 131-1275264	
Front top roller pressure	18 kg	19 kg	
U%	12.27	11.84	3.50
CVm	15.48	14.91	3.68
-50%	52	28	46.15
+50%	64	36	43.75
+200%	138	118	14.49
Total IPI	254	182	28.35
Objectionable faults A4+B4+C3+C4+D3+D4	63.3	55.3	12.64
Total short thick faults A1+A2+A3+A4+B1+B2+B3 +B4+C1+C2+C3+C4+D1+ D2+D3+D4	1460	1273	12.81
Total long thick faults E+F+G	235.3	142	39.65
Total long thin faults H1+H2+I1+I2	1320	1305	1.14

Performance data of TeraSpin PK 2025 v/s TEXParts PK 2630 SE weighting arm

Ring frame make	Marzoli Dongtai	
Raw material	100% cotton (Millange)	
Drafting	TEXParts PK 2630 SE	PK 2025
Cradle	OH 2022 - 1247888	OH S 168
Roving hank	Ne 0.7	
Yarn count	Ne 30s K	

Drafting	TEXParts PK 2630 SE	TeraSpin	% improvement
Yarn quality paramters			
U%	11.39	10.41	8.60
CVm%	14.52	13.22	8.95
-40%	111.3	34.6	68.91
-50%	0.8	0.4	50.00
+35%	998	556.7	44.22
+50%	192.5	72.9	62.13
+200%	87.9	60	31.74
+280%	20.4	12.5	38.73
IPI	281.2	133.3	52.60
Micro IPI	1129.7	603.8	46.55

Ring frame make	BEST Machinery, China	
Raw material	100% cotton	
Drafting	TEXParts PK 2630 SE	PK 2025
Cradle	OH 2122 - 6020689	OH S 168
Roving hank	Ne 0.7	
Yarn count	Ne 28s K	

Drafting	TEXParts PK 2630 SE	TeraSpin	% improvement
Yarn quality paramters			
U%	10.26	9.88	3.70
CVm%	13.03	12.52	3.91
-30%	910	716	21.32
-40%	46	27	41.30
-50%	2	1	50.00
+35%	500	415	17.00
+50%	46	38	17.39
+200%	101	96	4.95
IPI	149	135	9.40
Micro IPI	1456	1158	20.47

Performance data of TeraSpin smart cradle OH S 168

Background

This case study relates to a well-known textile mill in north India with an installed capacity of approximately 100,000 spindles. The mill's product portfolio is mainly made up of medium and fine yarn counts of a very high quality to keep up with their brand image.

The mill was quite impressed with the design concept, features, and benefits of TeraSpin Smart cradles. However, not willing to take any chance with quality, they initially placed a small order for TeraSpin Smart cradles for conducting trials on one ring frame to assess the performance of the Smart cradles. Fully satisfied with the outstanding results after the trial run, the mill replaced their existing cradles with TeraSpin Smart cradle OH S 168 on approximately 26,000 spindles.



Result

With TeraSpin Smart cradle OH S 168, the mill achieved significant improvement in the quality of the yarn count Ne 30s CH.

- 5% improvement in U%
- 28% reduction in total imperfections (IPI)
- 37% reduction in micro imperfections
- 23% reduction in total winding cuts/100 km of yarn
- 37% reduction in total faults/100 km of yarn

As with the trial run, the customer is very happy with the performance of TeraSpin Smart cradle OH S 168!

Performance data of TeraSpin standard spindles

Background

One of India's well known specialty spinning mills, recognised for spinning the best quality fine and super fine 100% cotton yarns, was looking at gaining maximum possible production while maintaining the highest yarn quality. In order to improve their productivity, the mill wanted to increase the speed of the ring frame. However, it was not possible to increase the speed of the ring frames with the spindles that were then on their ring frames. Hence, the spinning mill decided to upgrade their ring frame spindles.

TeraSpin – experts in spinning machinery components

Highest possible ring frame performance requires the highest quality spinning machinery components. The spinning mill therefore approached TeraSpin for its requirement of high speed spindles. TeraSpin recommended and supplied spindles with HF-100 inserts to meet the mill's requirement of high quality with high speed.

These spindles were installed and commissioned in April 2016. The results speak for themselves, and the said spinning mill is extremely happy with the performance upgrade possible with TeraSpin's spindles.

Performance of TeraSpin high speed spindle with HF-100 inserts

Raw material	100% cotton
Yarn count	Ne 60-80 combed compact yarn
Ring diameter	36 mm
Bobbin length	170 mm
Wharve diameter	18.5 mm
Maximum spindle speed with TeraSpin spindle	24000 rpm
Average spindle speed with TeraSpin spindle	23000 rpm

Conclusion

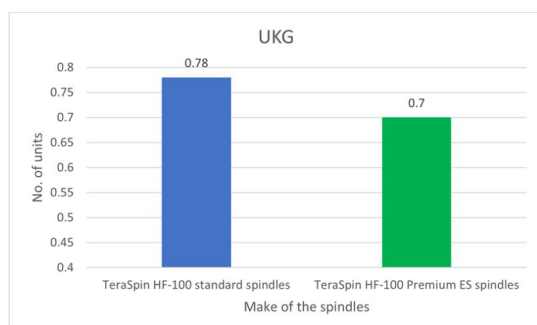
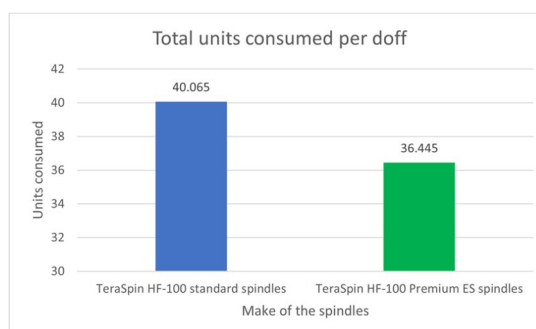
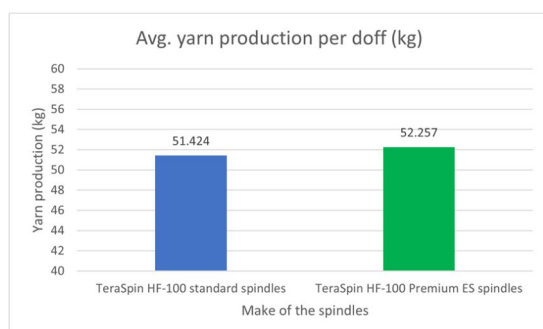
TeraSpin high speed spindles equipped with HF-100 inserts can run consistently with a spindle speed of 24000 rpm, enabling this specialty spinning mill to reach its dual goals of high speed with high quality.

Performance data of TeraSpin Premium ES (Energy Saving) spindles

Parameters

Make & model of the ring frame	LMW LR 6
No. of spindles per ring frame	1200
Bobbin length	190 mm
Weight of empty bobbin	32 g
Ring dia.	38 mm
Plug length of the spindle	170 mm
DUI	17.85 mm
Roving hank	Ne 0.62
Yarn count	Ne 18 CH
TM / TPI	3.8 / 16.12
Max. spindle speed	16000 rpm
Avg. spindle speed	15240 rpm
Yarn length in full bobbin	1670 m

	TeraSpin HF-100 standard spindles	TeraSpin HF-100 Premium ES spindles
Wharve dia.	18.5 mm	18 mm
Weight of spindle top part	240 g	242 g
Avg. yarn production per doff	51.424 kg	52.257 kg
Total units consumed per doff	40.065	36.445
UKG	0.78	0.7



Conclusion:

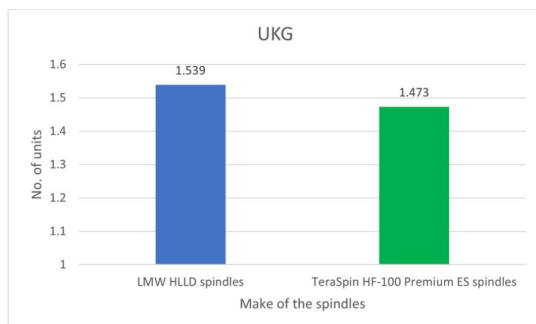
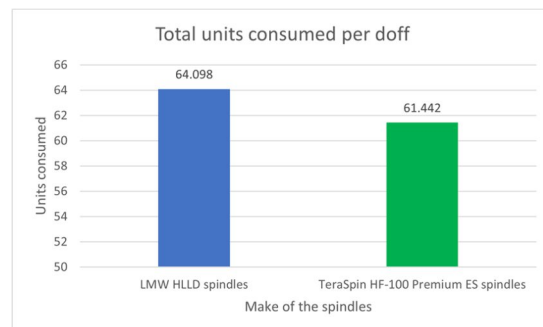
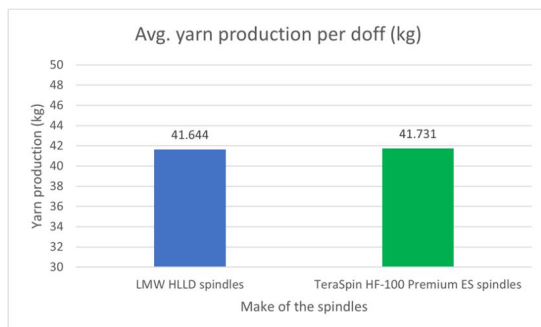
UKG reduced with TeraSpin Premium ES spindles 08 : 0.

% UKG reduced with TeraSpin Premium ES spindles 10.32%

Parameters

Make & model of the ring frame	LMW LR 6/S
No. of spindles per ring frame	720
Bobbin length	200 mm
Weight of empty bobbin	34 g
Ring dia.	38 mm
Plug length of the spindle	180 mm
DUI	17.85 mm
Roving hank	Ne 1
Yarn count	Ne 38 (100% dyed polyester)
TM / TPI	2.78 / 17.13
Max. spindle speed	19500 rpm
Avg. spindle speed	17779 rpm
Yarn length in full bobbin	3800 m

	LMW HLLD spindles	TeraSpin HF-100 Premium ES spindles
Wharve dia.	18.5 mm	18 mm
Weight of spindle top part	242 g	238 g
Avg. yarn production per doff	41.644 kg	41.731 kg
Total units consumed per doff	64.098	61.442
UKG	1.539	1.473



Conclusion:

UKG reduced with TeraSpin Premium ES spindles 066 : 0.

% UKG reduced with TeraSpin Premium ES spindles 4.29%

Overview:

The customer is one of the prestigious & multi-dimensional group in South India. They are one of the largest textile company in India having their processes right from Ginning to Garment. They are manufacturing premium quality of cotton fabrics & garments.

Challenges:

Every textile industry now-a-days looking for improving productivity & reduction in cost. Customer was looking for best option available in the market to replace their existing ring spinning spindles.

TeraSpin approached them with Premium ES spindles, which is not only power saving spindle but also very economical solution with fastest ROI.

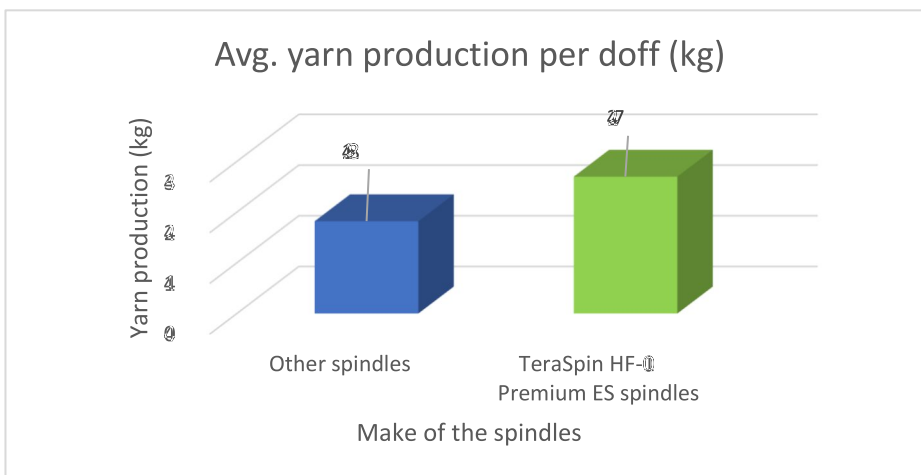
Customer being a regularly buying TeraSpin spindles decided to go for Premium ES spindles & found fabulous power saving.

Parameters:

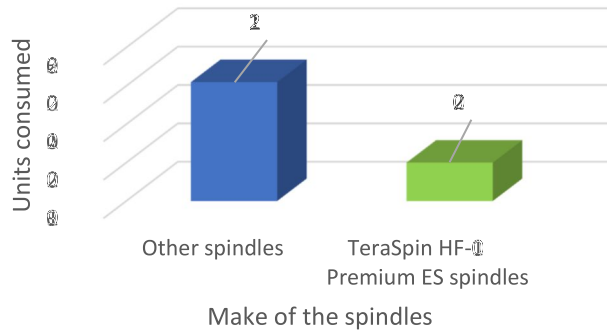
Make & model of the ring frame	KTTM RXI 240E
Number of spindles per ring frame	1200
Bobbin length	180 mm
Ring dia.	36 mm
Yarn count	Ne 61s CWC
Max. spindle speed	22000 rpm
Avg. spindle speed	21622 rpm

Result:

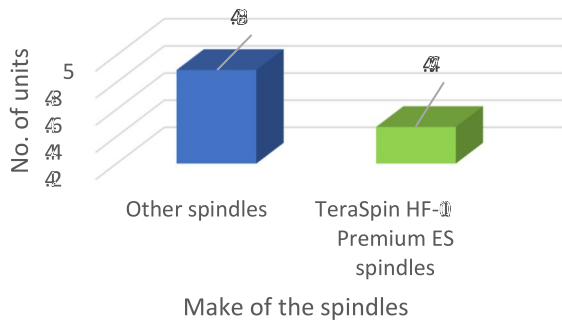
	Other spindles	TeraSpin HF-100 Premium ES spindles
Wharve dia.	18.5 mm	18 mm
Avg. yarn production per doff	41.82 kg	42.7 kg
Total units consumed per doff	221	200
UKG (Units of power consumed per kg of yarn)	4.89	4.47



Total units consumed per doff



UKG (Units of power consumed per kg of yarn)



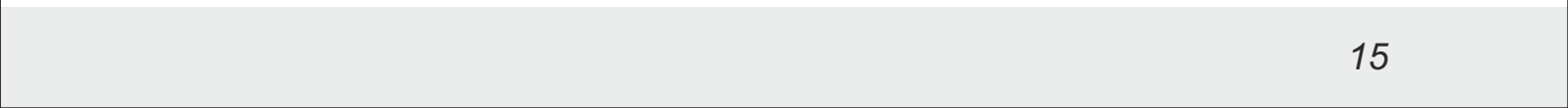
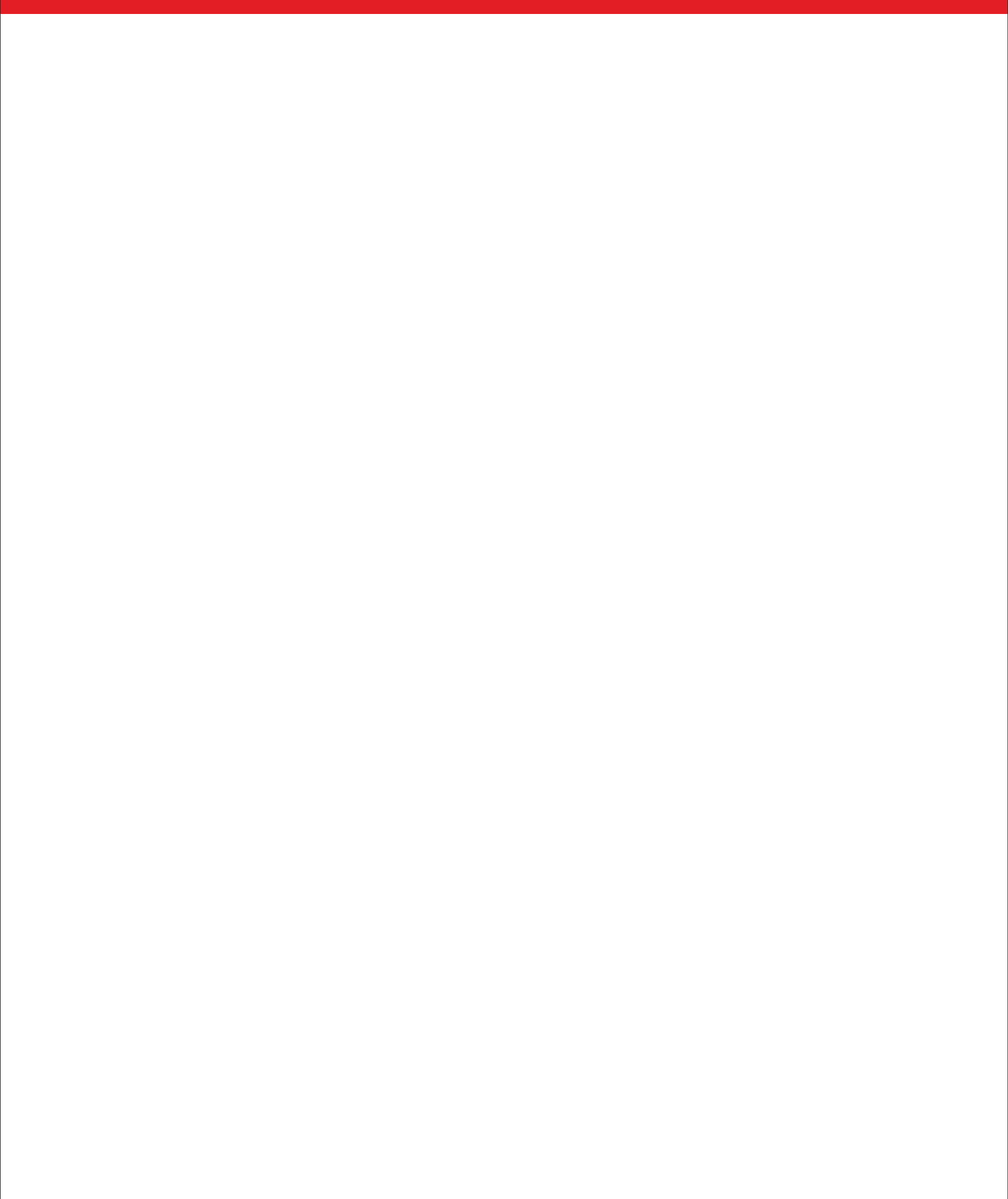
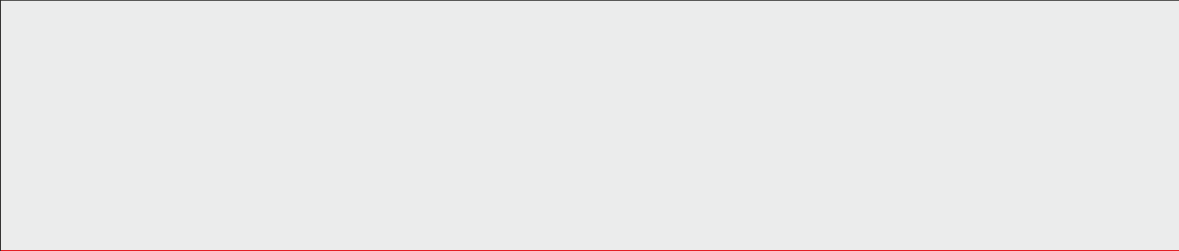
From the above power consumption details, it is clear that UKG is reduced by 0.42 units with the TeraSpin Premium ES spindles, which work out to a power saving of 8.6% as compared to the other brand of spindles.

The customer is very happy with the performance & has placed repeat order for Teraspin Premium ES spindles.

Performance data of TeraSpin spindles with Smart Yarn Catcher (SYC)

Performance of SYC spindle at Sambhav Spinning								
Spindle make	Raw material	Yarn count (Ne)	Ring dia. (mm)	Bobbin length (mm)	No. of turns on device	Start up breaks %	Cleaning cycle of Yarn Catching Device as per mill's standard (no. of days)	Yarn accumulation at the end of cleaning cycle
TeraSpin HF-100 spindle with SYC	Viscose	30s & finer	38	200	1.5	2.3	45 days	No yarn accumulation observed

Performance of SYC spindle at AGT Mills								
Spindle make	Raw material	Yarn count (Ne)	Ring dia. (mm)	Bobbin length (mm)	No. of turns on device	Start up breaks %	Cleaning cycle of Yarn Catching Device as per mill's standard (no. of days)	Yarn accumulation at the end of cleaning cycle
TeraSpin HF-100 spindle with SYC	Viscose	30s	38	200	1.75	1.4	15 days	2-3 rounds on 40% of spindles only. On 60% spindles no yarn accumulation
LMW spindle with CS 1 insert & Novibra CROCOdoff device	Viscose	30s	38	200	1.5	3.2	15 days	
LMW spindle with CS 1 insert & Texparts ZUW device	Viscose	30s	38	200	2.5	4.3	15 days	





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