

# Estimate of Draft in Carded and Combed yarn Manufacturing

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Most of the spinning mills in Pakistan process cotton to produce carded and combed yarns involving the use of Ring Spinning Frames or Compact Spinning System.

Open-End Rotor Spinning machines are also used to produce coarse and medium category of carded yarn counts. In general, the processes performed on cotton are blowing, carding, doubling and drafting, roving formation, spinning and winding of carded yarns.

For producing combed yarns, the material is also passed through a combing set comprising of a pre-comber, draw frame, lap former and generally four combers.

In case of Open-End Rotor Spinning, Yarn is spun from finished drawframe sliver and directly wound on cones eliminating processes of roving and winding. Except in case of the winding machine, the material is drafted at each process. The draft at each processing stage is in accordance with the Spin Plan and is estimated accordingly.

## 1. Carded yarns

Approximately 75% of Pakistani cottons are in the medium long staple category. The 2.5% Staple Length ranges from 26.20 to 27.80 mm or  $1\frac{1}{3}$  to  $1\frac{3}{32}$  inches. Carded yarns up to 40 Ne can be spun from these cotton at commercially competitive and industrially profitable output

rate. Spin Plan usually adopted for producing 20 Ne and the draft required at each processing stage is tabulated below.

## 2. Combed yarns

A modern Combing set usually comprises of one pre-comber draw frame, one lap former and four combers. The combed sliver is also given two passages of draw frames similar to procedure adopted for carded yarns before roving formation. Spin Plan usually adopted for 60 Ne Combed yarn and draft required at each processing stage is tabulated below:

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Spin Plan for 20 Ne Carded Yarn				
Serial No.	Process stage	Linear Density Grains / yard (hank or count)	Draft	Remarks
1	Blowroom Lap	6125 (0.00136)	2.5	Scutchers are not used in modern blowrooms. Material is fed to the cards via chute feed system. Waste extraction at card has been assumed at 7.0% two passages of draw frames.
2	Card Sliver	70 (0.119)	94.09	
3	Finished Drawframe Sliver	70 (0.119)	64	
4	Simplex Frame (Roving)	0.75	6.30	
5	Ring Spinning Frame (yarn)	20	26.67	
Total Draft		= 2,529,455.3	= 2.53 million	

Spin Plan for 20 Ne Carded Yarn				
Serial No.	Process stage	Linear Density Grains / yard (Hank or Count)	Draft	Remarks
1	Card sliver	65 (0.128)	94.23	Chute feed system, Carding Waste @ 7%. 48 slivers are fed to the Lap Former Noils extracted @ 18% Two passages of Drawframes. Total draft in the case of combed yarns is much higher than that for carded yarns.
2	Pre-comber Draw Frame	65 (0.128)	8	
3	Lap Former	846.672 (0.00984)	3.685	
4	Combed Sliver	50 (0.167)	135.468	
5	Finished Sliver	50 (0.167)	64	
6	Simplex Frame Roving	(2)	11.98	
7	Ring Spinning Frame (yarn)	(60)	30	
Total Draft		8655.5 Million		