

Technical Data for a Roller-Air Spinning Machine

Machine Type

Double sided open-end roller-air spinning machine constructed in sections. Machine pitch 210 - 220mm.

Number of Spinning Positions

Each section will contain 16 Roller-Air spin-boxes and the machine will be supplied with a maximum of 18 frames, giving a maximum of 288 spinning positions.

Optional Automated Features

Doffing - Similar to a rotor spinner.

Piecing - The Roller-Air spin-box has been designed so that the automated piecing robot has a minimum of functions to perform. Consequently, existing piecing technology used in automatic winding or rotor spinning can be readily adapted to the Roller-Air spin-box

Machine Width

Between 2,200 to 2,600mm dependent on method of construction.

Can Sizes

Diameter up to 500mm - Height on standard machine up to 900 mm - If machine is raised by 100mm then height up to 1,050mm.

Fibre Types

All fibres up to 40mm in length.

Input Sliver

Tex	English Cotton Count	Metric Count
1500 - 6000	0.4 - 0.8	0.67 - 0.17

Yarn Count

Tex	English Cotton Count	Metric Count
60 - 13.5	10 - 45	17 - 76

Yarn Twist

Infinitely variable, but restricted by minimum yarn strength requirements.

Roller-Air Perforated Roller Speed

Standard - Infinitely variable from 2,000 to 6,500 rpm.

Option - Infinitely variable from 2,800 to 8,000 rpm.

Yarn Delivery Speeds

Standard - 100 to 300 metres per minute.

Option - 140 to 400 metres per minute.

Air Suction Systems

Fibre-dust etc. Removal, Perforated Roller Cleaning, and Package Doffing - Similar to a rotor spinner.

Spinning - Maximum 25 cubic feet per minute (0.7 cubic metres per minute) at 45 inches (114.3 cm) water gauge per position.

Total Air Requirements

Positions	Cubic feet/minute	Cubic metres/minute
32	800	22.66
160	4,000	113.28
192	4,800	135.93
256	6,400	181.25
288	7,200	203.90

Draft Range

From 50 to 275 approximately, with incremental changes.

Feed Speed

Determined by delivery and draft employed, but with a minimum value of 0.4 metres per minute.

Combing Roller (Beater or Opening)

Speeds and method of adjustment of speed are similar to that used on rotor spinning machines, nominally 5,000 to 8,000 rpm adjustable in steps of 500 rpm.

Drive Method for Roller-Air Spin-boxes

A tangential belt running along each side of the machine to drive the yarn-forming rollers via an auxiliary drive roller on each Roller-Air spin-box. To achieve infinitely variable drive it is preferred to have an individual variable speed drive to each side of the machine. The power required for each drive is 12 - 15 hp for a maximum perforated roller speed of 6,500 revolutions per minute, and 20 hp for a maximum perforated roller speed of 8,000 revolutions per minute. The system needs to be able to hold speed to within plus or minus 2% and preferably within plus or minus 1%.

Drive Methods for Rest of Machine

Rotor spinning principles will be used for the drive to the feed, delivery, combing roller and winding drum.

Winding

Method - An individual cam and follower mounted on a shaft running along the length of each side of the machine.

Angle - Adjustable by gear from 13 to 22 degrees (26 to 44 degrees if cross over angle is to be quoted).

Anti-patterning - By continuous alteration of rotational speed of cam. Tension draft - Adjustable by infinitely variable drive over range 0.9 to 1.1.

Traverse displacement - Built into design of each cam.

Winding Head Standard Features

(a) Package lift at end break. (b) Package (cradle) damping. (c) Yarn guide - Ceramic guide attached to follower.

Winding Head Option 1

Cylindrical (cheese) package with dimensions as per a rotor spinner with a 150mm traverse and 300mm maximum diameter as a norm, with another option to increase diameter to a maximum of 400mm Also, with the facility to produce both hard wound packages for normal use, and soft wound packages for dyeing. In addition, the option to have waxing as per a rotor spinner.

Winding Head Option 2

Conical packages with a cone angle available with a taper of either 3 degrees 51 minutes or 4 degrees 20 minutes. No need to provide a soft wound package facility. Waxing as per Option 1.

Winding Head Operation

The principle of maintaining a constant "drive position" throughout the build will be used. This will be achieved by a specially designed cam to produce a hard spot at the drive position. A yarn storage device will be incorporated, which will be mechanically driven or use springs.

Roller-Air Open-End Spin-Box

Designed so that any existing rotor spinner's machine frame & automation can be readily adapted.

Main Features

In this publication we are only prepared to divulge in very general terms the design features of Roller-Air.

Fibre Opening Section

The Roller-Air spin-box has been designed so that any existing rotor spinning system can be readily adapted.

Spinning Elements

The twist insertion characteristics of the technology allow all yarns to be processed with a high efficiency level and thus reduce power requirements.

Piecing

Immediately a yarn-end break occurs, the spin-box itself automatically executes internal self-cleaning. This feature, allied to no need to power-down, reduces and greatly simplifies what the automatic piecer needs to do when a yarn-end break occurs on a rotor spin-box.