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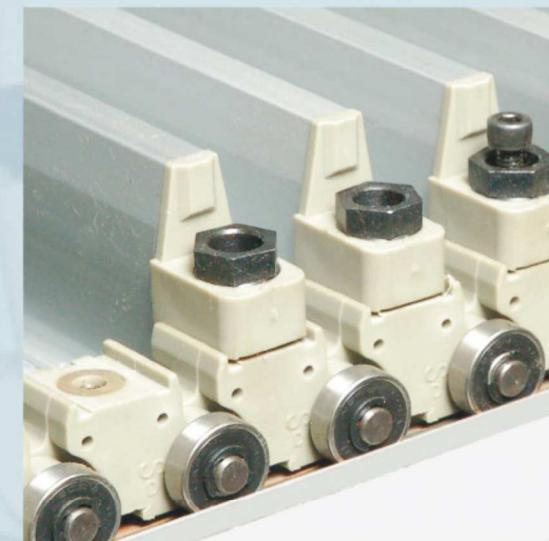
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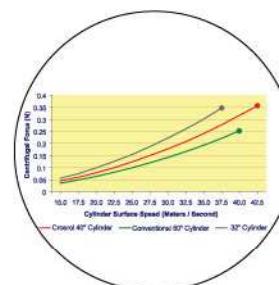
COCrosrol

MK7 CARDING MACHINE

Shanghai Crosrol Pacific Machinery Co.,Ltd.

MK7 High Production Carding Machine

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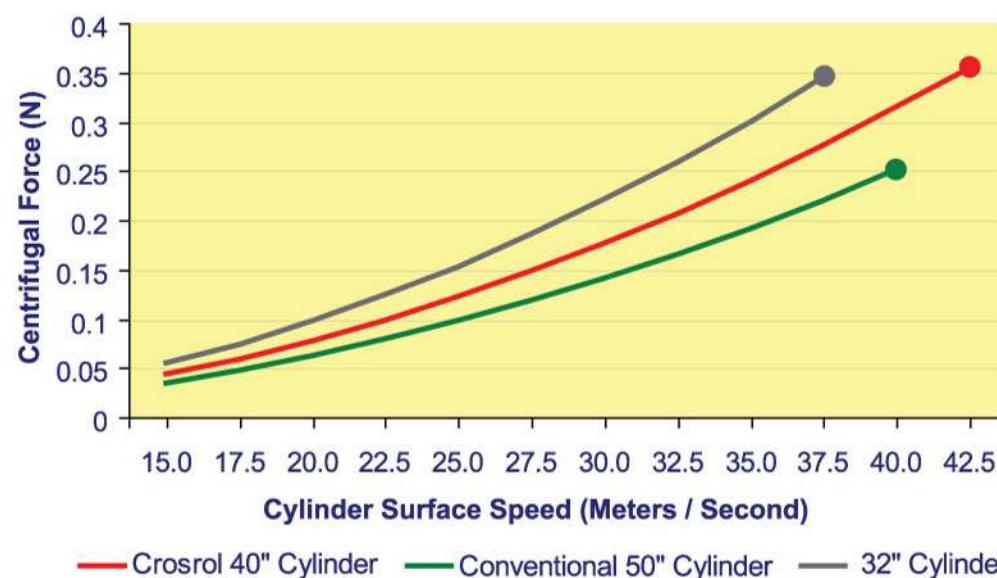
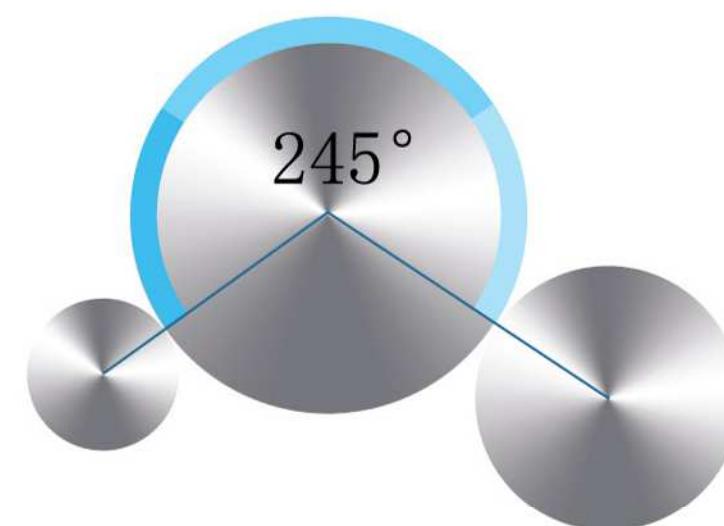
Ultimate Carding Power From The Carding Specialists

For over 60 years, Crosrol, the 'Carding Specialists' have been responsible for almost every major development of Carding, From the legendary 'Crossed Rollers', to the world's most successful card, the MK4, Crosrol continues to lead the world in Carding technology. Our research and development efforts have always been dedicated to the process of Carding, with all its vital implications for the preceding and following operations in the process of converting fibres into yarn, Only with true dedication and many years of experience can the process of Carding be fully understood leading ultimately to the optimum Card.



**Ultimate Carding power,
achieved by optimising the
three key influential factors
of the Carding process,**

- Carding Area
- Carding Speed
- Centrifugal Force



● Carding Area:

Crosrol, the world's first Carding machine manufacturer (1983) to recognize the significant benefits of increasing the carding length around the cylinder fully appreciate the delicate balance of maximizing Carding with preserving the natural characteristics of the fiber.

The MK7 further optimizes this important aspect of the card with an increased Post-carding area resulting in a combined 245° carding length – significantly increased when compared to previous models of Crosrol Cards.

● Carding Speed:

Ultimate carding speed is achieved only by design, the unique construction of the Crosrol cylinder – the world's first to be constructed from steel rather than Cast-iron for ultimate stability, together with its unique 40" (1016mm) diameter operating at surface speeds of over 42.5 meter per second - far higher than any other Card manufacturer. This combination of stability and ultra-high surface speeds significantly contribute to enhanced Carding power together with high throughput rates.

● Centrifugal Force:

Probably the least understood factor influencing the Carding machine but one of the most important factors when determining the total Carding power especially when calculating the Trash and Nep removal capabilities.

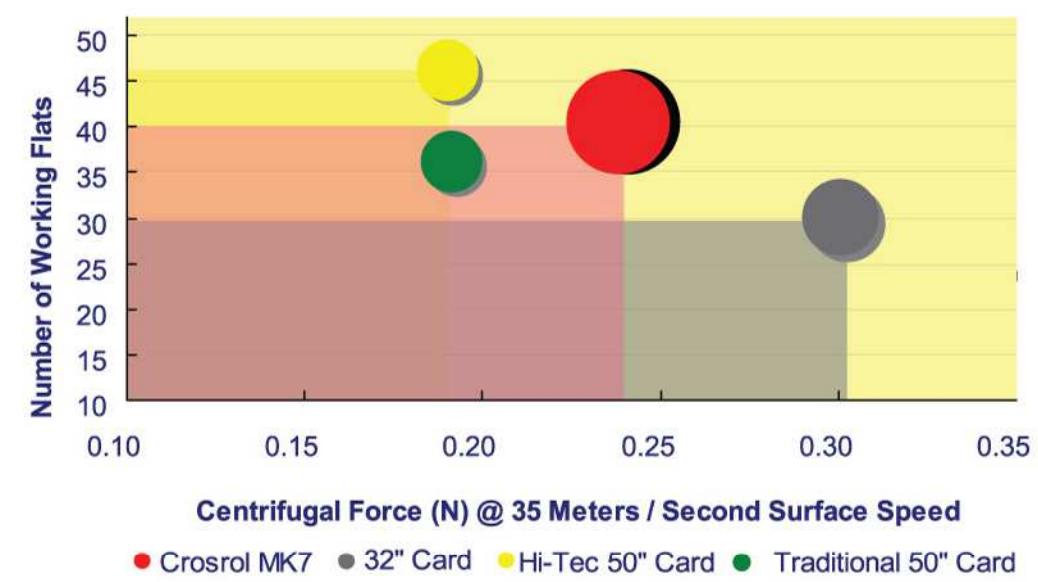
Centrifugal force generated by a Card is calculated by examining the complex relationship between Surface speed and radial distance from the rotating axis (Cylinder diameter). Crosrol's innovative 40" (1016mm) diameter card Cylinder together with its ultra-high surface speeds results in the highest generation of Centrifugal forces available in the world today.

● Crosrol Carding Power:

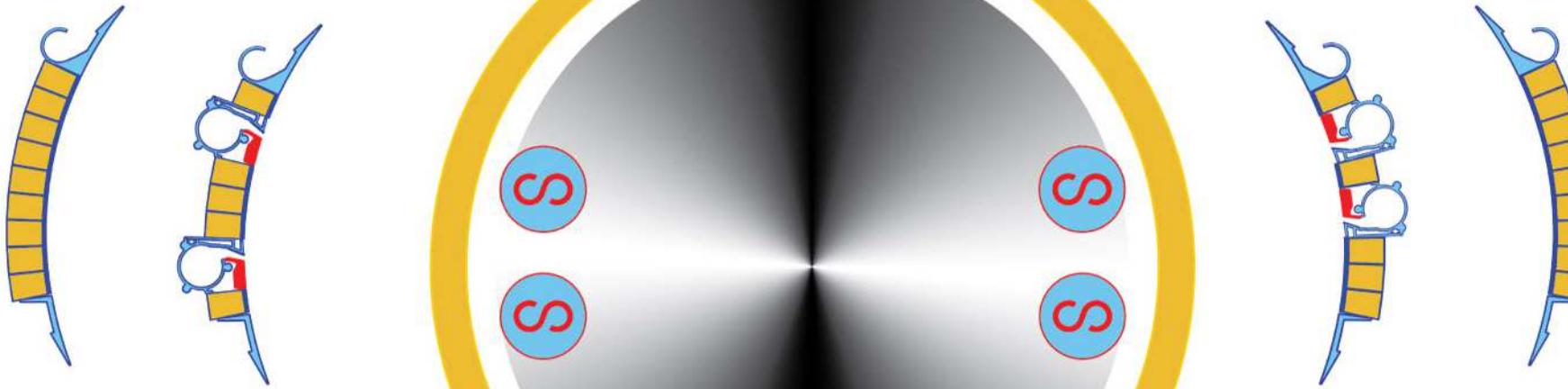
With the innovative design of the Crosrol MK7 card, ultimate Carding power can be finally delivered, the delicate yet complex relationship between Carding area, Carding speed and Centrifugal force been further optimized, this together with the Crosrol renowned precision and stability of the critical Carding elements ensures that the MK7 is the perfect solution for today's high efficiency spinning units.



**Technological superiority,
Innovative concepts, with
exceptional low owning &
operating costs make the
MK7 Card the logical
solution for your Carding
requirements.**



Carding Flexibility Becomes a Reality



Crosrol

Taker-in Waste controls with
'Dial-in' settings ensure
maximum fibre yield,
'Dial-in' adjustable Pivoting
Control plates working in
conjunction with specially
developed Cleaning knives for
ultimate control of trash &
short fibre removal.



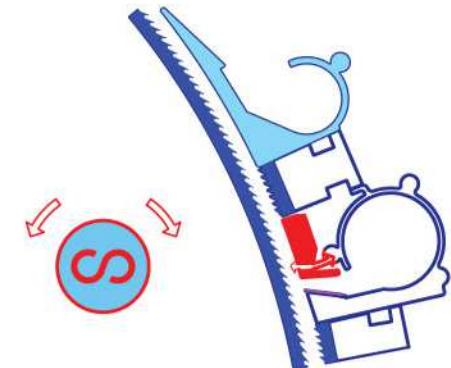
- In today's ever-changing world, flexibility becomes the key to operating a successful business; Spinning units find that their customer's demands for yarn types and qualities are changing on an almost daily basis.

Due to the very nature of a Carding machine making changes to the machine set-up has been both labor-intensive and time consuming, therefore most spinning units opt for 'universal' settings rather than material specific settings so as to obtain maximum fiber yield and optimum quality.

SPEED			MAIN	DATE	RUNTIME	WEEK
rpm CYLINDER	rpm TAKERIN	m/min COIL/OFF				
750	850	1.001				
750	850	200				
720	800	200				
FLAT	rpm HSR	m/min PRODUCTION				
450	1800	200				
420	1700	40				
400						



All material processing rollers driven by frequency controlled digital invertors for optimum speed settings with fingertip control, Single point Revolving flat settings in conjunction with individually adjustable flats for precise settings.

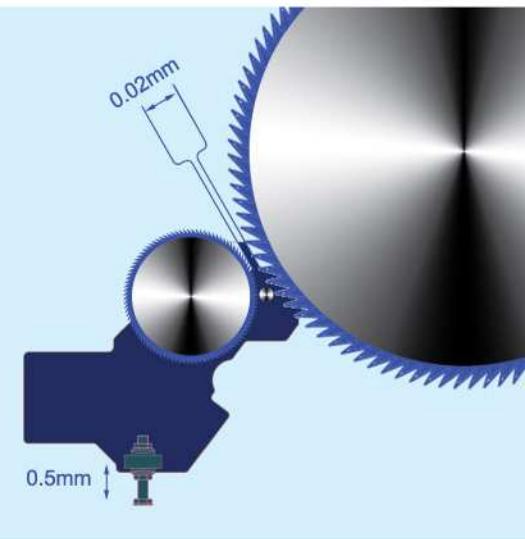


- The new MK7 card makes this type of methodology redundant, with the unique Crosrol waste control systems, Dial-in operating speeds and modular Carding arrangements, all material dependant settings can be changed within minutes allowing for complete Card settings to be changed faster than the Bale lay-down of a Blowroom line.

Unique Crosrol 'Dial-in' waste control settings fitted as standard to all cards give the ability to optimize settings quickly and easily without the need to halt Carding production.

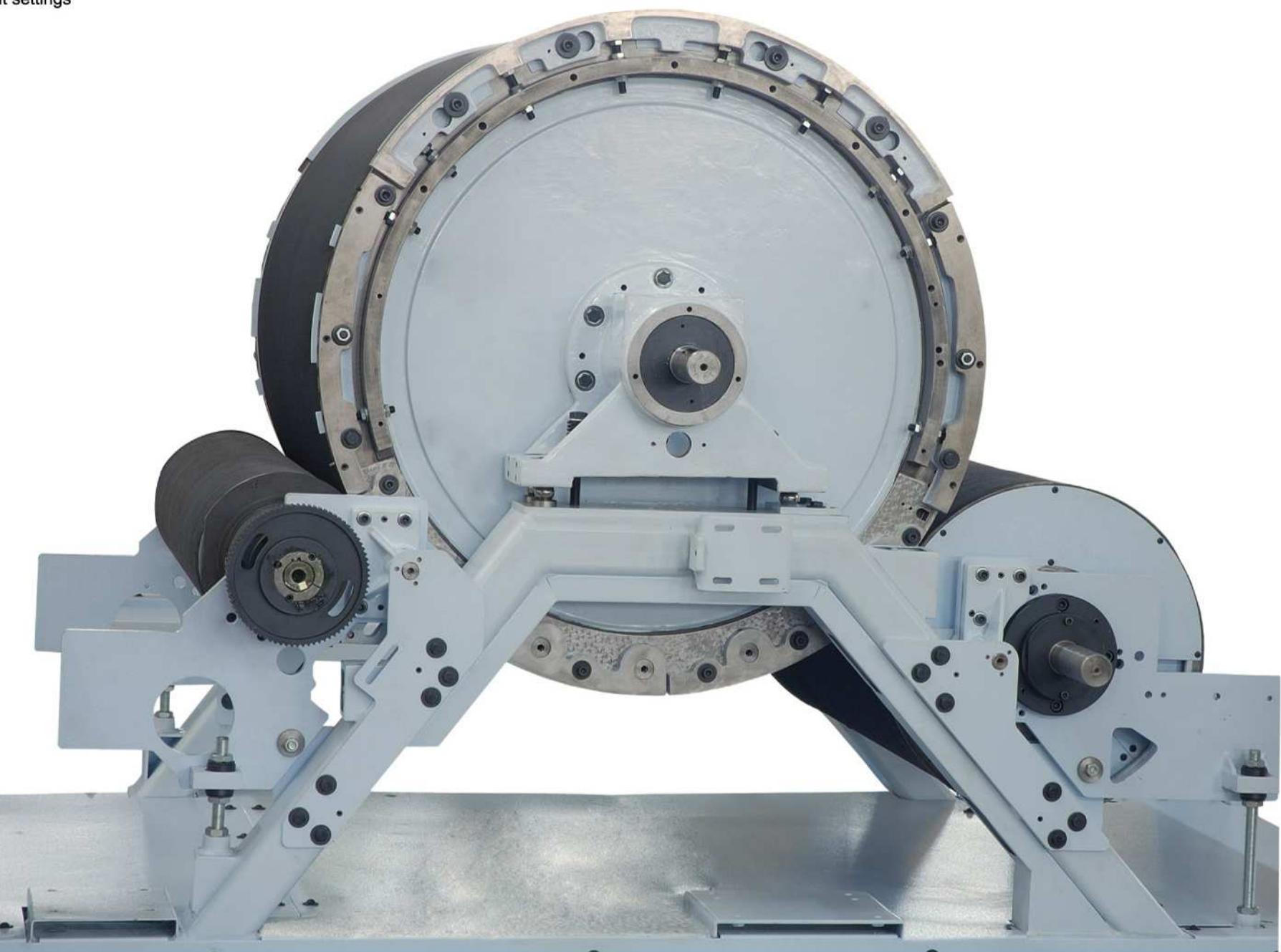
Modular Card 'A' Frame Construction

- Newly designed high strength A frame ensures maximum engineering design strength.
- Maximum stability at Cylinder speeds of up to 900rpm
- Proven 3 point mounting position for Cylinder roller
- Unrestricted under card access for cleaning and maintenance
- Pivoting setting points ensure accurate and consistent settings

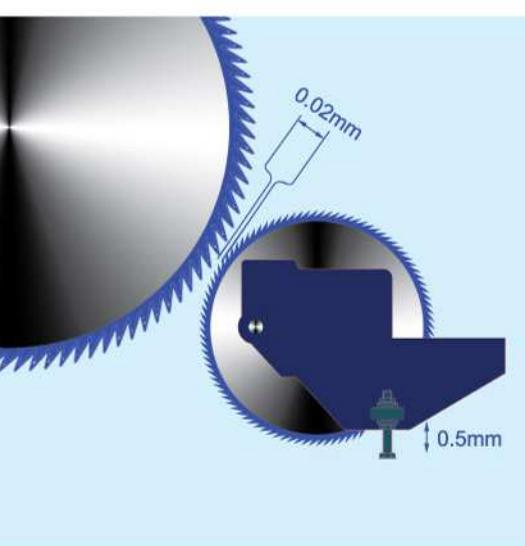


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- Increased Strength
- Maximum Stability
- Total Access



- Lateral setting movement is replaced with Arc movements which results in greater control over the setting procedures small accurate adjustments to settings can be confidently carried out.



Revolving Flat Systems

The interaction between revolving Flats and the Cylinder is at the heart of every Card, Throughout Crosrol's history we have always focused on this key function, devoting many years of product development to pursue perfect flats performance. In consequence the Crosrol revolving flat systems are distinguished in the field of Carding.

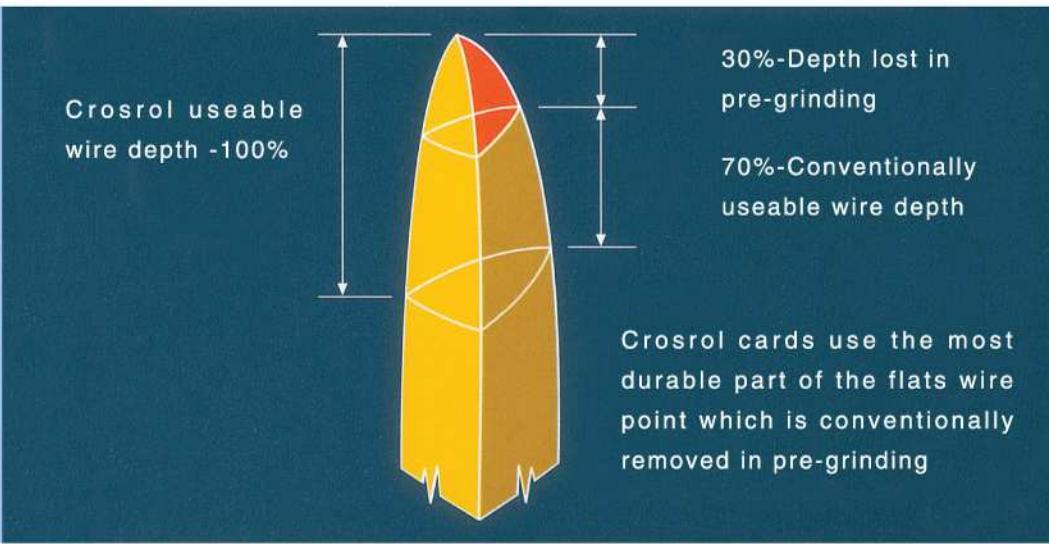
- Each individual revolving flat can be height adjusted by means of a fine pitched adjusting screw incorporated into each end of the flat bar. This unique feature ensures that the height of the whole set of revolving flats is kept uniformed resulting in the highest possible accuracy of the Flat to Cylinder setting for ensured and effective combing and cleaning of the fibres. The height adjusting feature eliminates the need for pre-grinding thus prolonging wire life to the maximum.
- Unique high strength industrial plastic Flat chains incorporating precision Ball bearings running on Hardened Cylinder bends eliminates wear and the need for lubrication thus ensuring consistent settings and low maintenance during the life of the Card.

Revolutionary flats mounting and driving systems for maintenance free performance, Friction-free operation resulting in Ultra-high operating speeds so critical to effective Carding at today's ultra-high production rates.

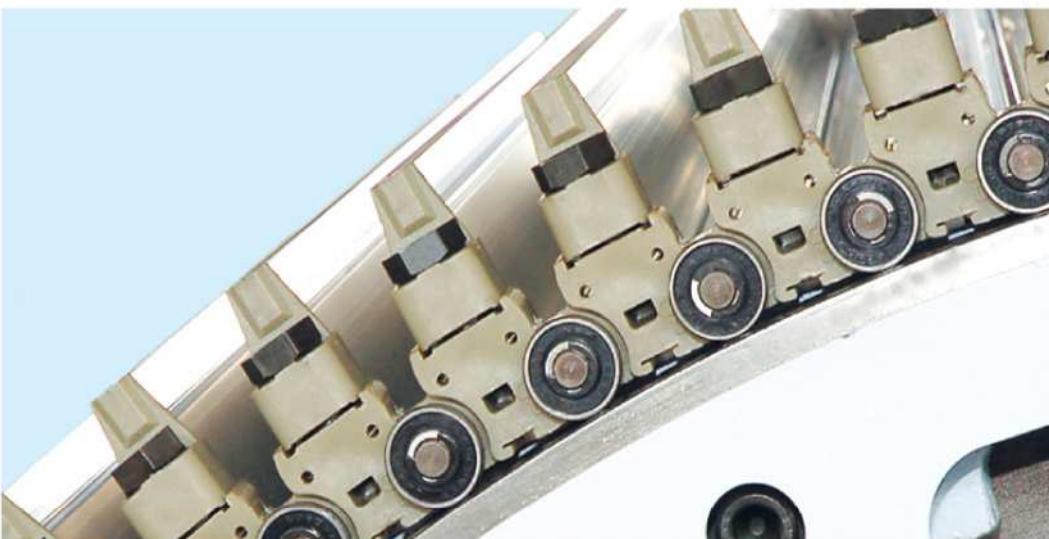


Crosrol

Crosrol revolving flats are precision set to a uniform height and do not require pre-grinding thus preserving the most durable part of the wire point.



- Rotary Flats stripping rollers (driven directly from the cylinder) clean flats efficiently, keeping Flat wires in the optimum condition for ultimate Carding.
- Single point Flats to Cylinder setting device (SPS) enables the vital Cylinder to Flats setting to be changed within seconds without the need for highly skilled Card technicians by means of a centrally operated lever, The actual flats setting is clearly ascertained by means of a graduated scale. This optional feature (SPS) gives greater flexibility to the spinning operation in optimizing the Cards performance for any given blend of fiber.
- Setting of the revolving flats on a Card is a laborious highly skilled task, The new Crosrol 'Flat setting control' device (supplied as standard) significantly reduces not only the time required for re-setting of the Flats after wire maintenance but ensures consistent and accurate settings are always achieved.



Modular Stationary Flat Systems



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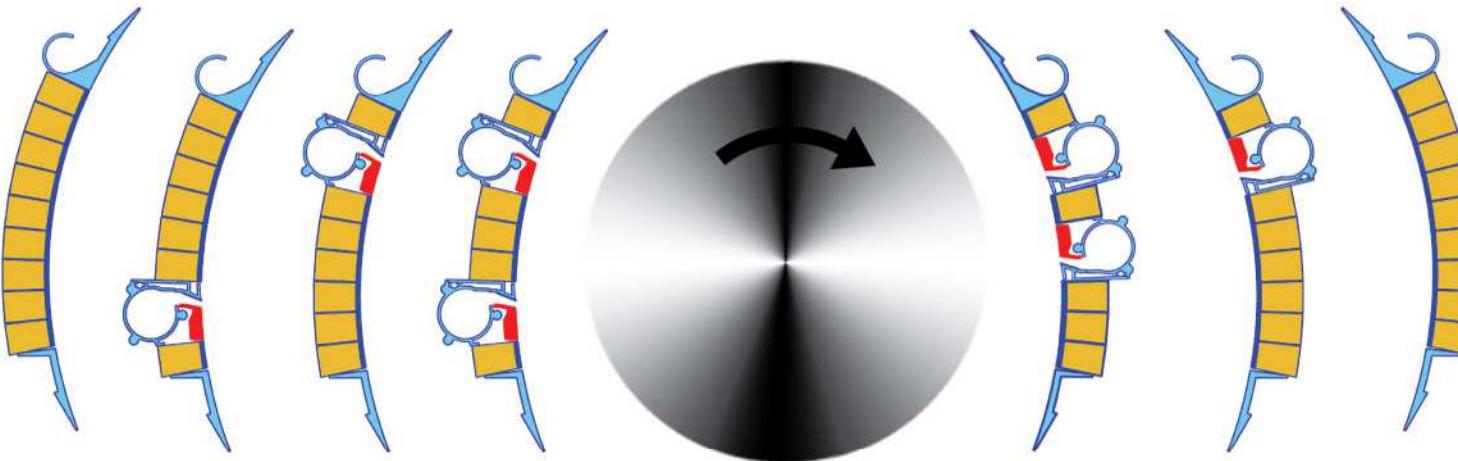
Unique modular concept for rapid optimisation of Pre & Post Carding zones ensures effective opening & cleaning with maximum fibre yield whatever your application.



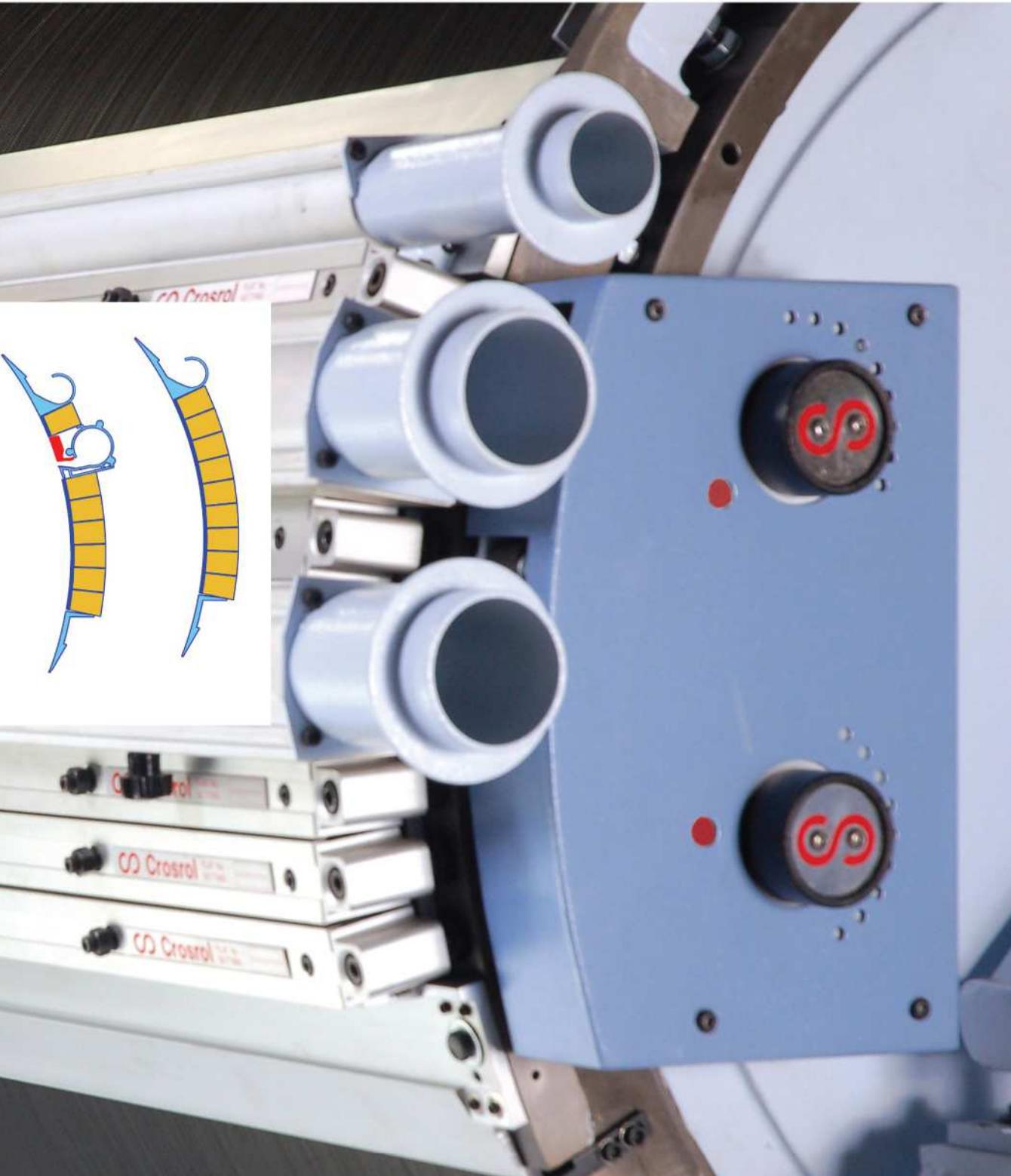
The new Crosrol Stationary Flat systems incorporating the unique modular concept of interchangeable Stationary Flats with highly effective aerodynamic waste extraction units allowing for multiple processing arrangements to be quickly configured to suit all conceivable material applications.

In conjunction with the patented 'Dial-in' waste control systems, the Crosrol Pre & Post Carding arrangements make significant contributions to better sliver quality with a significant increase in the operating life of Carding wires.

- Aerodynamic waste extraction systems consisting of a newly contoured control plate for high efficiency airflow, working in conjunction with the Crosrol patented Trash-knife and recently developed interlocking 'quick-removal' waste extraction system.



- Crosrol patented 'Dial-in' waste control systems give precise control over the amounts of Trash, Short Fibre and micro-dust extracted. These unique devices give the ability to optimize waste removal settings quickly and easily without the need to halt carding production. The simple colour coded dial systems allow Card operators to make precision adjustments to maximize fiber yield from any Card within seconds.
- In addition to precision adjustment screws at each end of all stationary Flat bars, The Post-carding Flats incorporate a further four fine adjusting points along the length of each bar making setting more precise and uniformed in this critical area of the Card.
- All Carding Trash knives have Crosrol patented round-profile blade edge for gently fiber preserving operation and are treated with molybdenum disulphide for maximum durability.



High Efficiency Multi-point Waste Removal System

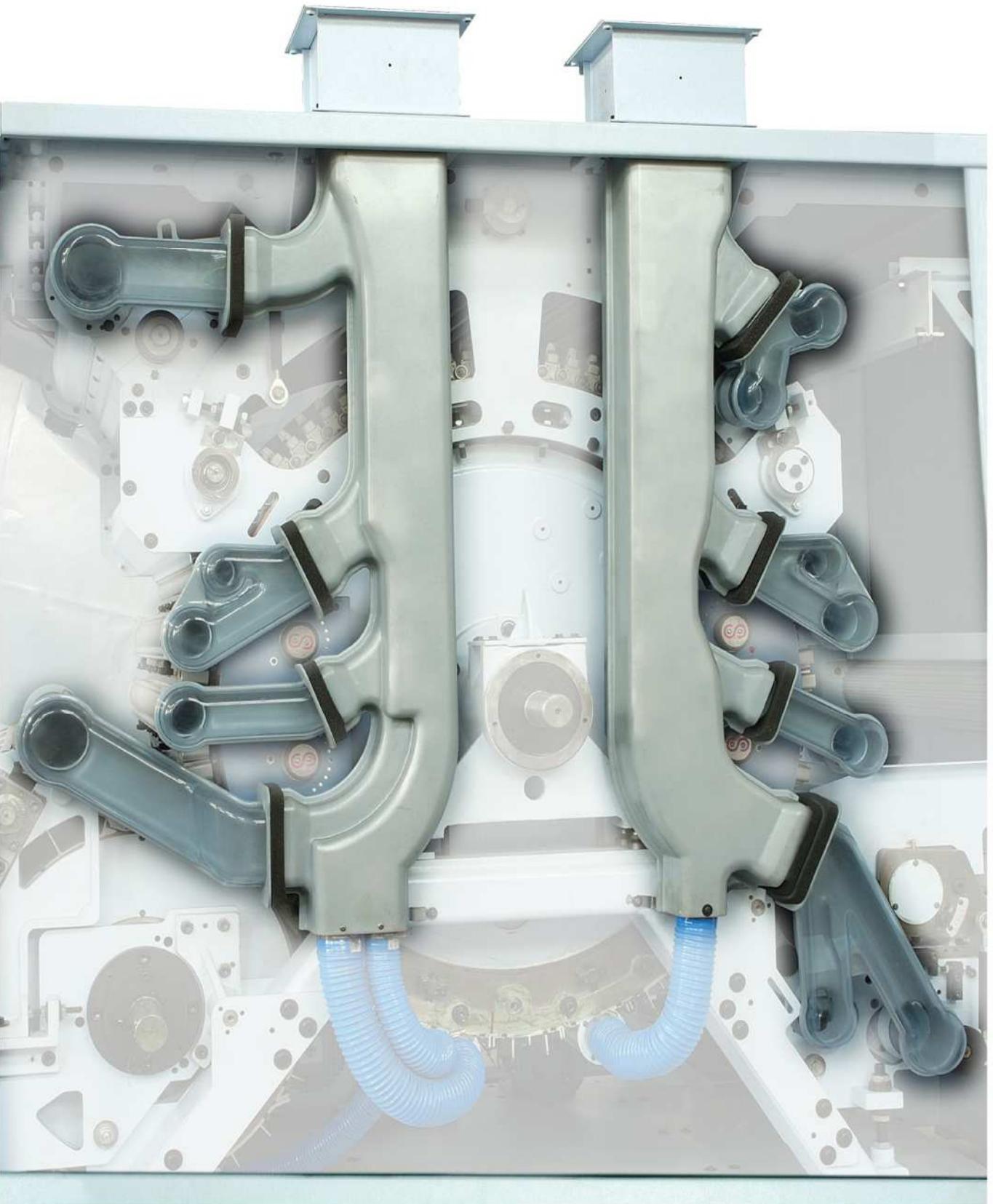
- For today's high production carding machines efficient waste extraction becomes critical to the overall machine's performance. Sliver quality is directly effected by a Cards extraction system, the new Crosrol waste Extraction system optimizes airflows with low negative pressures in order to remove trash and dust particles efficiently.
- Unlike other Card manufacturers who have combined waste extraction, Crosrol's separation of 'Clean' and 'Dirty' card wastes enables significant advantages to be had in re-processing of Waste fibres leading to major savings.
- The permanent suction system of the MK7 card has been further optimised to ensure a low air requirement of only 3700 m³/h with minimal operating sub-pressure of only 750 Pa, These values are significantly lower than many other alternative systems presently available resulting in major cost savings to be made in terms of Filtration.



Crosrol

Efficient operation result in significant energy savings with lower filter capacities required, Crosrol Magna-duct connections for ultimate easy of service.

- A typical Cotton processing MK7 Card can be fitted with up to 15 separate Waste extraction points, With in-depth development precise air-flow and sub-pressure have been accurately calculated for each of the 15 extraction points so as to ensure the exact air amount is directed to the specific extraction point.
- The integral ABS moulded ducts with transparent sections provide an insight into the suction hoods at all times, even whilst the card is in operation.
- Crosrol Magna-duct connections enable suction ducts to be rapidly removed and replaced without the need for any tools, a simple series of magnetic clasps hold each duct arm rigidly in position.
- Aluminium waste ducts are fully integrated into the machine's construction, eliminating the need for access restricting support plates.
- With the Crosrol high cylinder centrifugal forces to liberate trash particles, Crosrol patented 'Dial-in' waste control systems and high efficiency multi-point waste removal system a clean sliver, together with maximum fibre yield and maintenance free operation is assured.



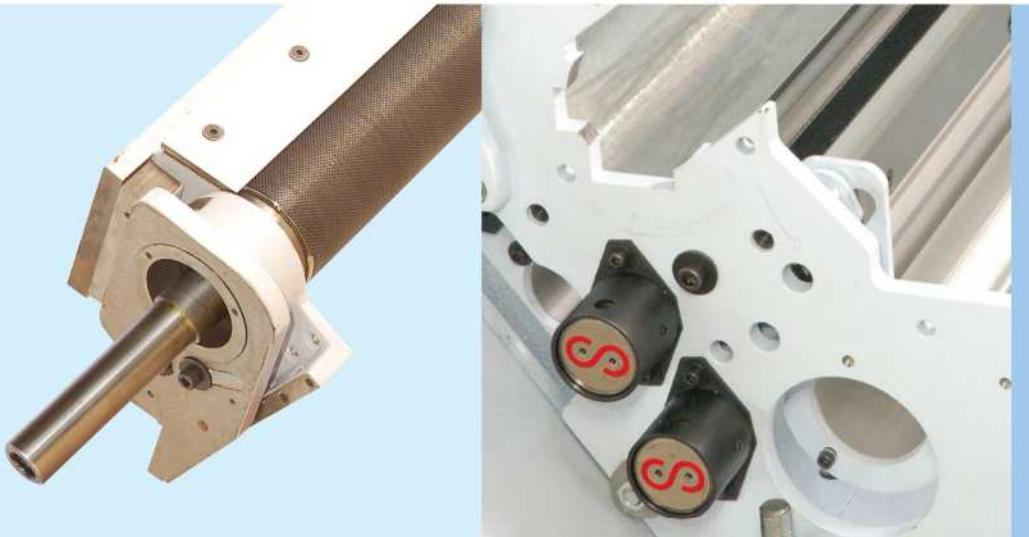
Pivoting Feed Control

- Crosrol's new pivoting feed plate arrangement ensures of a wide range of staple lengths are easily catered for.
- Inverted feed plate reduces short fibre generation whilst at the same time improving the opening capabilities of the Taker In region even at higher production rates.
- Wire covered feed roller ensures optimum fibre control.
- This simple, accurate and easily adjustable setting system allows infinite adjustment of the feed plate nip point between 20 and 40mm from the Feed roller / Taker In material transfer point. This new innovation not only ensures efficient fibre opening, but also protects fibre parameters whatever the staple length.

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Controlled waste extraction

Protection of fibre properties



Crosrol Web Control and Transfer

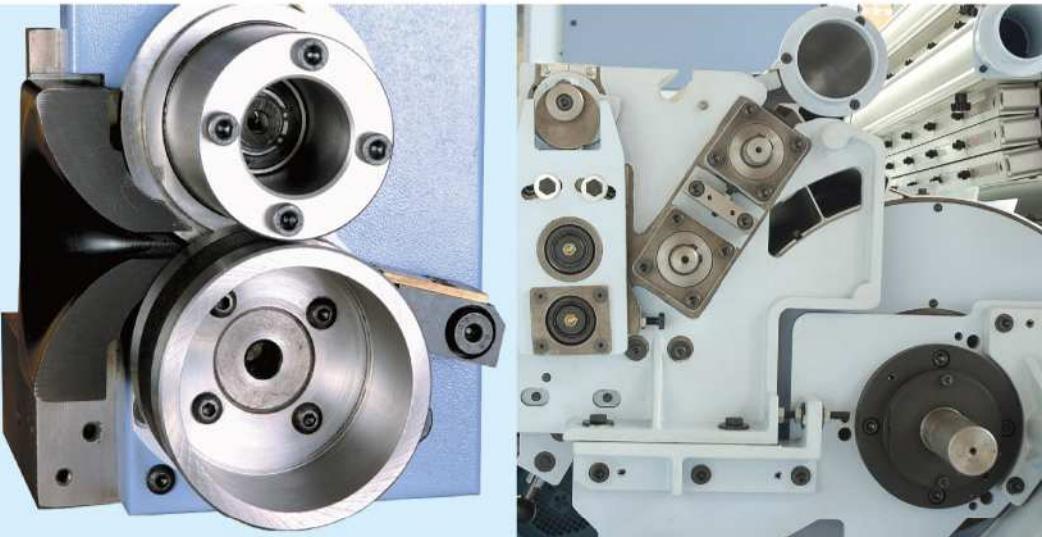
Web control is one of the final processes carried out by the carding machine, and as such has a great influence on the quality of the sliver produced. Poor web control at this point can undo all the previous good work done throughout the carding process. Crosrol has carried out extensive developments in this area. The benefits of which can now be seen on MK-7. Highly efficient tubular extrusions provide effective waste removal, but with reduced extraction requirements.

A further benefit is the increased time between routine cleaning intervals.

- Fully enclosed Doffer with friction free coating on undercasing prevents the possible build up of fibre obstructions and eliminates web disruption.
- Low maintenance extruded waste removal plenums around the stripping roller and Highspeed roller prevent the accumulation of fly and dust, whilst providing effective extraction for waste fibres.
- Any remaining trash in the web is then crushed by Crosrol's crossed rollers crushing system.

Crosrol

Crosrol's patented split trumpet self Piecening device increases production efficiency whilst reducing Piecening waste.



Adjustable Taker-In Waste Control

- Taker In waste is the most costly area of fibre loss at the card. Effective waste control in this area is vital to the quality of your end product.
- Our new modular Taker-In waste control unit provides excellent control over waste percentage and fibre yield. The unit is simply installed / removed and can be replaced after routine maintenance without the need for re setting.
- Twin mote knives remove heavy trash and motes. In Running adjustment of these features ensures minimum good fibre loss, whilst maintaining optimum cleaning efficiency. The inclusion of a carding segment liberates smaller trash and provides additional opening and fibre alignment for transfer to the Cylinder.
- Highly efficient tubular extrusions provide effective waste removal, with reduced significantly extraction requirements and increased time between routine cleaning intervals resulting in a cleaner working environment.



- Long term auto levelling is an integral part of the web collection system providing effective sliver weight control from the card feed roller to the overlapping sensing rollers.

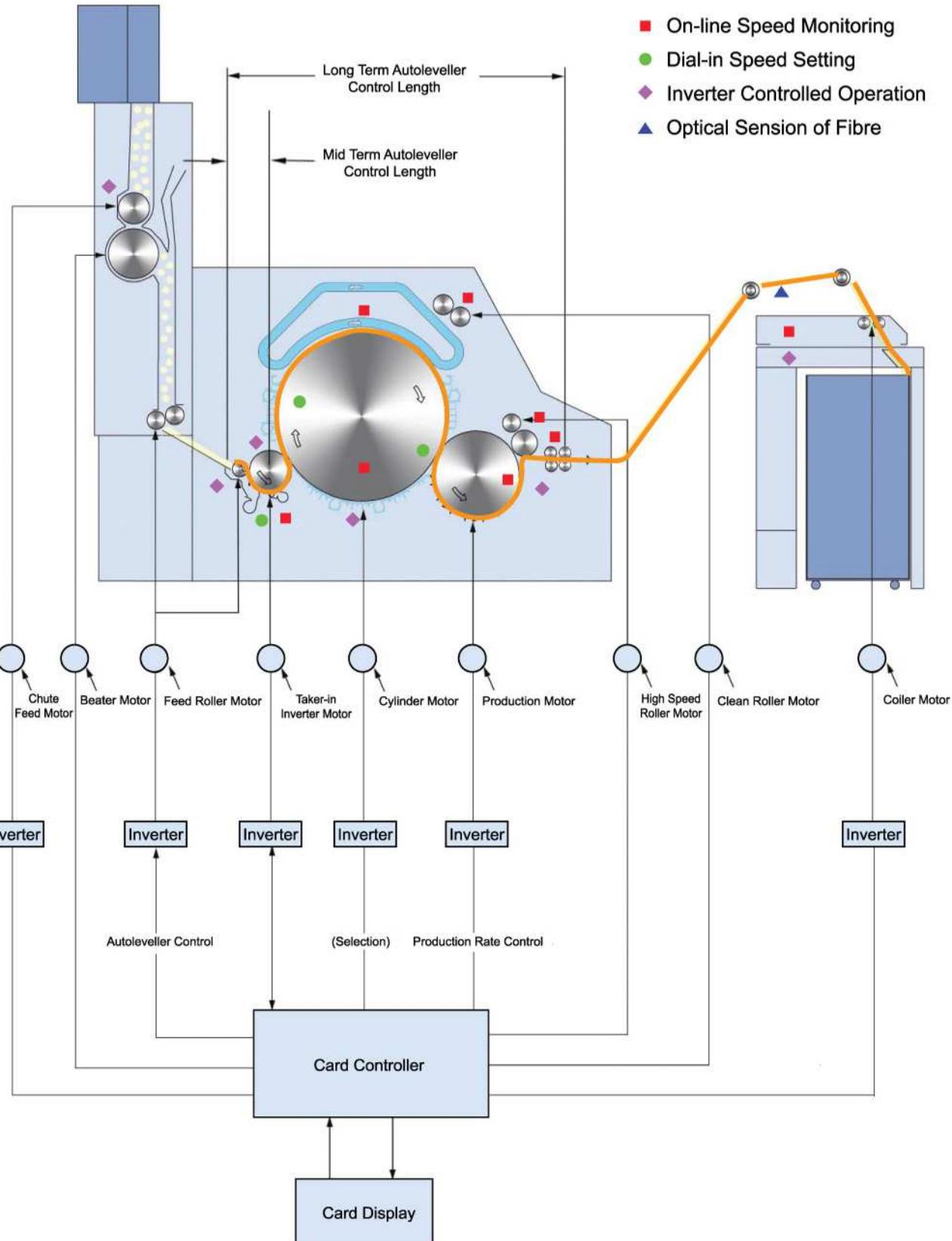


Card Control With Integrated Auto-levelling Systems

- The MK7 card utilizes the latest generation of European PLC based control systems from Siemens. The ultra-high processing capabilities together with inherent stability ensure rapid and consistent processing of machine data.
- Industrial type full colour Touch screen operating display (800 x 480 Pixels) working in conjunction with eight touch-sensitive keys provide a largely language-independent operation via generally understandable symbols, diagrams and pictures.
- Continuously updating graphical status reports on a clearly structured series of screens allow for complete machine operating data including production rates, operating speeds, quality information (Sliver weight & CV%) and routine service requirements to be displayed.
- Greatly enhanced diagnostic's, clear pictorial indication of precise nature and location of fault with suggested remedial actions.



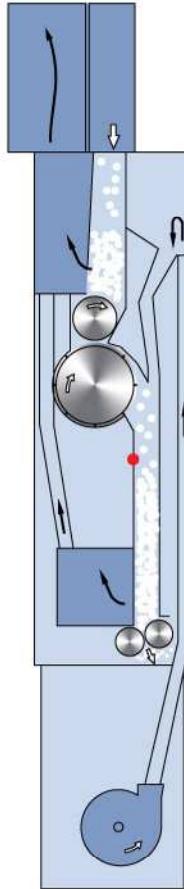
- MK7 carding machines incorporate both closed-loop Long-term and Mid-term auto-levelling as part of standard equipment, with programmable correction limits to suit mill specific quality standards,
- Long-term sliver variations detected by ultra-reliable over-lapping rollers, using precision rotary transducer technology; insensitive to delivery speed, and un-affected by fibre type or atmospheric changes. Long-term correction via inverter-controlled drive to Card feed roll.
- Mid-term closed-loop auto-leveller augments the long-term system attenuating sliver irregularities at wavelengths as short as 1 meter. Patented system uses torque-sensing controller at Taker-in to detect variations in in-feed volume, and adjusts the feed roll speed accordingly.
- Sensing after the correction point gives inherent stability of Closed-loop control (Controllers which measure variation at the feed roll itself are open-loop so lack this inherent stability).
- Hard wired Electrical control cabinet located at the rear of the machine for ease of maintenance. Extensive use of European origin electrical components for long-term reliability, specific cabinet layout ensuring heat generating components are remotely located from machine control systems together with in-built cooling devices for optimum operation under extreme conditions of temperature and humidity prevailing in spinning mills.



Integrated Chute Feed

The unique simplicity of the Crosrol Chute Feed makes for total reliability and ease of operation, with easy access for machine operation and periodic maintenance. The newly improved unit is fully integrated into the construction of the MK7 Card this together with the new control systems, significant improvements are seen over previous models.

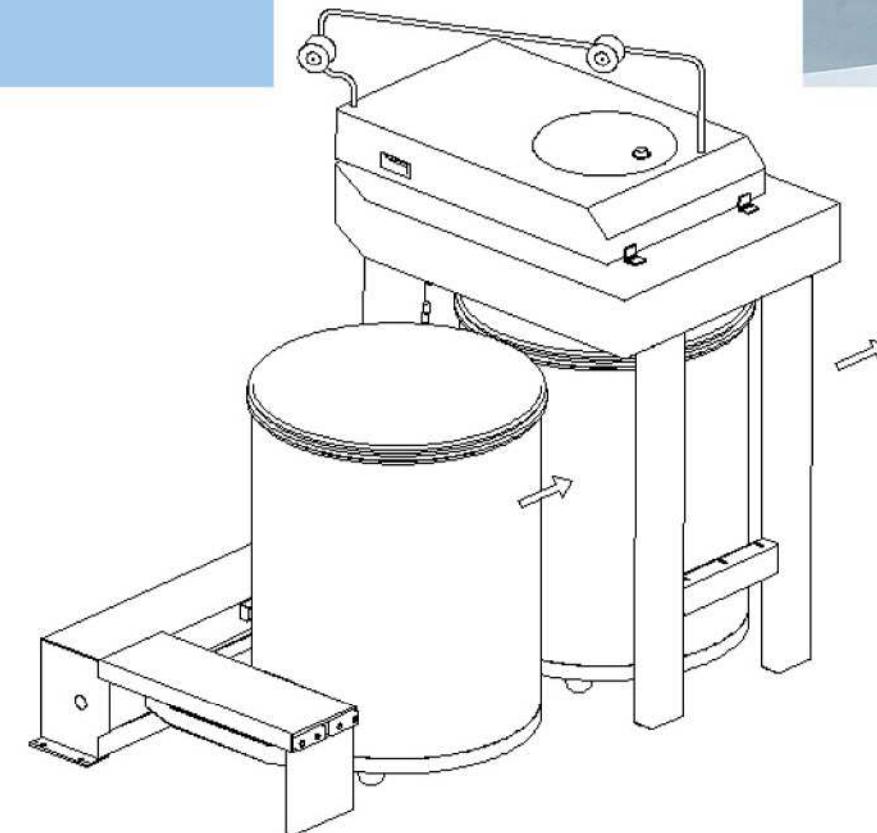
- Fully Integrated chute feed with dial-in settings from card controller ensures uniformed density for optimum batt regularity and much improved sliver variation
- Feed to upper (reserve) chamber controlled by air pressure, fibre transport fan (CFMTF) is inverter controlled, to facilitate line balancing.
- Inverter controlled wire covered feed roll providing continuous feed from the upper (reserve) chamber via a spirally pinned opening roller to the lower (batt formation) chamber,
- Material level in the lower (batt formation) chamber controlled by Digital pressure monitoring transducer so as to maintain a constant feed density to the Card, this new method significantly reduces sliver variation resulting in a 5 meter CV% of <1.5% in many applications. All excess air and dust extracted to central filter, only clean air is used for fibre transportation.
- Chute Delivery roll driven by means of a timing belt rather than Chain to further improve Card CV% and reduce routine maintenance.
- Different blends can be fed from each end of the Chute line, to varying numbers of cards for total flexibility, Interconnecting feed & extraction ducting between the chute feed units is supplied as standard significantly reducing installation costs.



Crosrol Remote Planetary Coiler

Sliver preparation for downstream processes is a critical component in the overall running efficiency of any spinning unit. We aim to eliminate unnecessary production stoppages due to can sliver breaks. Crosrol's planetary coiler provides an efficient presentation of sliver with its unique over centre coiling system providing even and consistent coil lay downs, which result in a smooth take up of the sliver at the following process.

- Unique over – centre Planetary coiling action ensures optimum can storage capacity.
- Simple Installation No underfloor driving mechanism required.
- Remote capability enables multiple floor positions
- Inverter controlled dial in drafts settings for slow speed and can change, eliminates CV peaks
- Newly designed drive mechanism, incorporating inverter controlled motor with robust gearbox and detent safety clutch. Dual timing belt drives result in a low maintenance high efficiency unit.
- Linear Automatic can changing requires less floor space than carousel type.
(Manual can change also available)



MK7 Card Specification

MK7 Floor Plan Dimensions

Material Processing Specification

Raw Material(Type and Length)	mm	22 - 76mm Cotton / Synthetic / Viscose
Feed Weight	g/m	340 - 930 g/m
Feed Stock Width	mm	965 mm
Sliver Weight	g/m	3.5 - 8.0 g/m
Production Rate	kg/h	up to 140 kg/h
Card Type		Lap or Chute Feed Configuration,

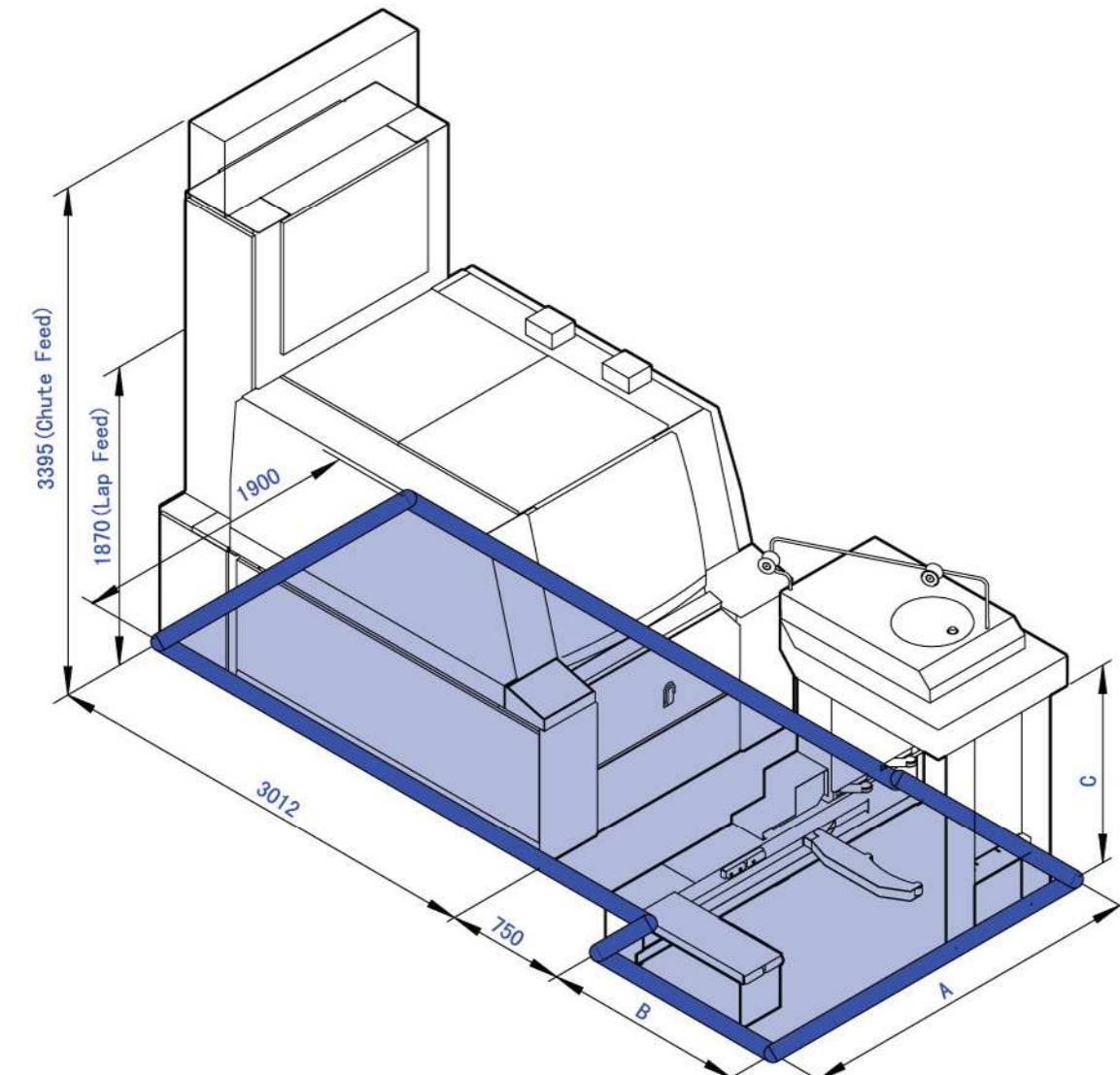
Technical Specification

Delivery Speed	m/min	up to 350 m/min
Cylinder Speed	rpm	425 - 900 rpm
Cylinder Diameter		1016mm (40")
Doffer Speed	rpm	40 - 120 rpm
Doffer Diameter		508mm (20")6
Taker-in Speed	rpm	60 - 1500 rpm
No. of Revolving Flats (Working / Total)		28 - 84
No. of Stationary Flats (Cotton applications)		14 maximum (Dependant on application)
No. of Stationary Flats (Synthetic applications)		14 maximum (Dependant on application)
Auto leveller		Medium & Long Term
Inverter-control Drives		Cylinder*, Doffer, Feed roll, Taker-in, Chute feed, Coiler
Coiler and Automatic Can Changer		Planetary Coiler with Automatic Can Changer
Installed / Consumed Power	kw	10.24 / 6.4 kw (Dependant on Production Rate)
Extraction Volume	m ³ /h	3700 m ³ /h
Extraction Pressure	Pa	750 Pa
Compressed Air Consumption	m ³ /h	0.12 m ³ /h
Compressed Air Pressure	bar	6 to 7 bar

*Dependant on Specification

Machine Specification

Working Width		1000 mm
Card Length (Inclusive of Chute / Lap Feed)		4740 mm
Card Width (Inclusive of 24" ACC)		1900 mm
Card Height (Inclusive of Chute Feed)		3395 mm
Card Weight (Inclusive of Chute Feed, and ACC)		4740 kg



Diameter (")	Height (")	Capacity (kg)	Dim A (mm)	Dim B (mm)	Dim C (mm)
24"	42"	34	1855	1005	1160
	45"	37			1245
	48"	39			1320
36"	42"	61	2300	1345	1160
	45"	66			1245
	48"	72			1320
40"	42"	72	2300	1345	1160
	45"	78			1245
	48"	85			1320