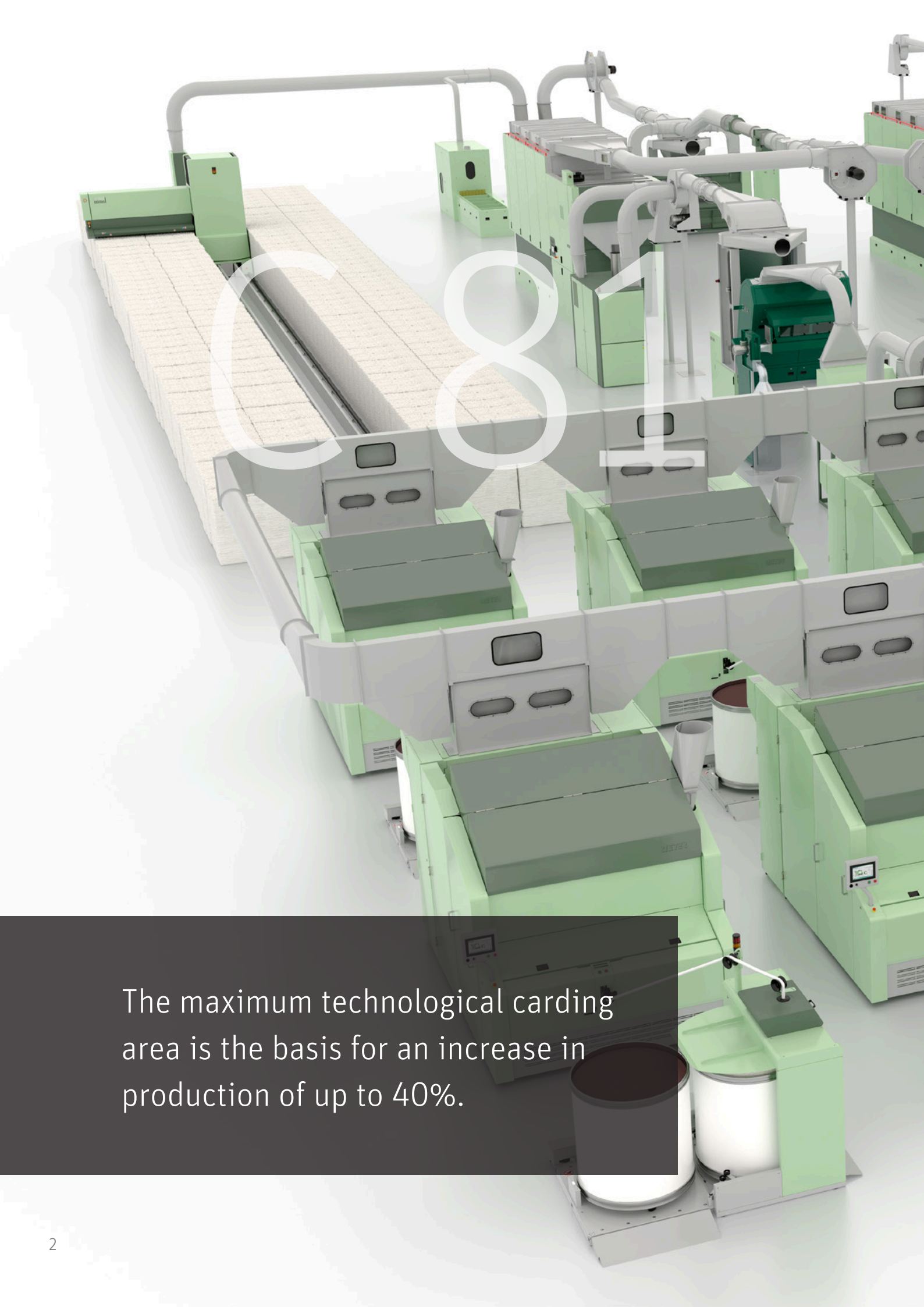# C 81

High-performance card C 81

C 81

Maximum use of carding area
enabled by artificial intelligence

C 81

The maximum technological carding area is the basis for an increase in production of up to 40%.

Up to 40% More Sliver – The Most Productive Card

Unmatched
Sliver Quality

Excellent sliver quality is achieved by the 40 active flats and a perfectly controlled carding gap under all conditions by Carding Gap Control.

M91

C 81

Up to 2% Higher Yield

C 81
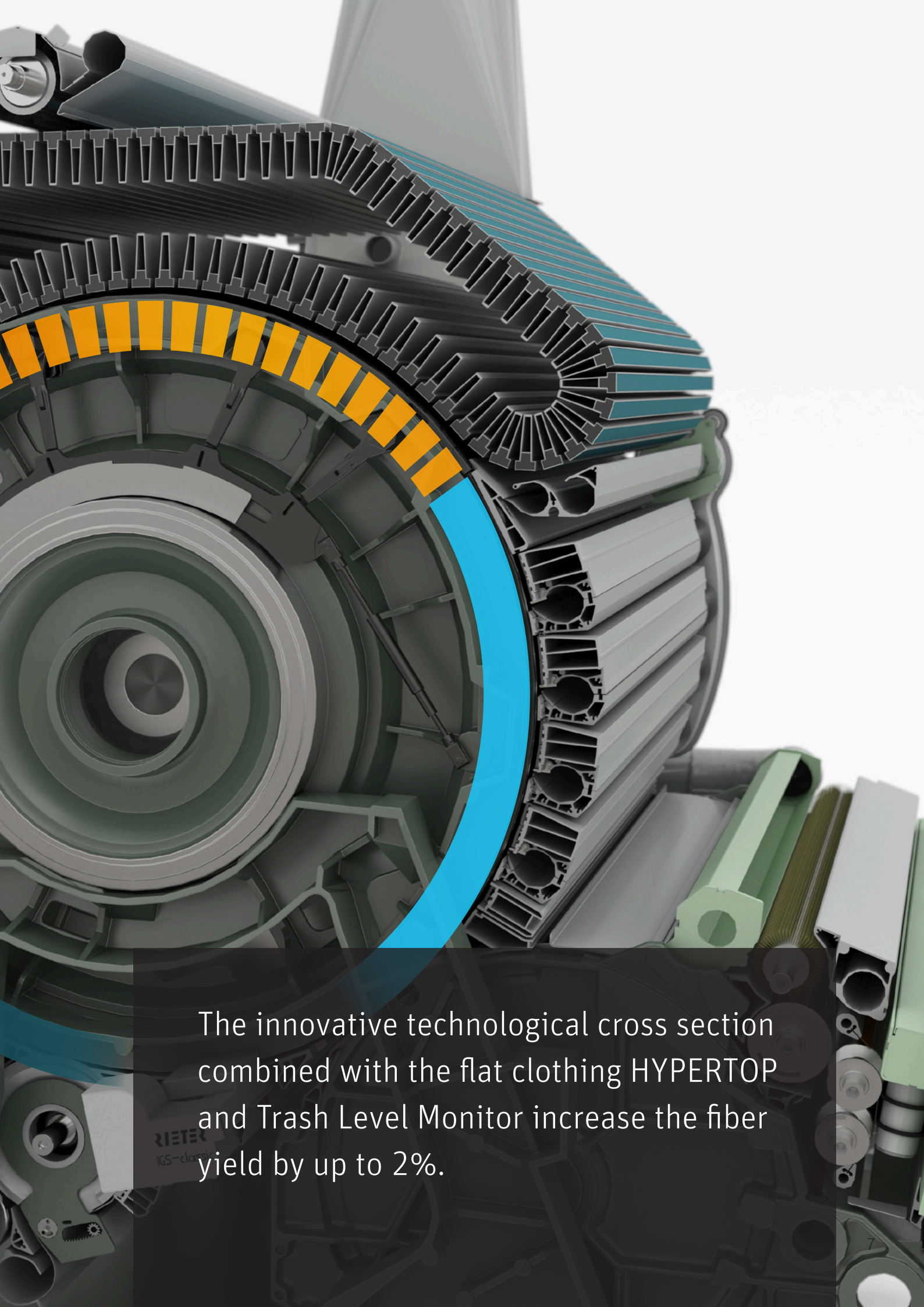
The innovative technological cross section combined with the flat clothing HYPERTOP and Trash Level Monitor increase the fiber yield by up to 2%.

Up to 2% Higher Yield

Innovative technological cross section combined with the flat clothing HYPERTOP and Trash Level Monitor

Up to 40% More Sliver

Maximum technological carding area as the basis for increased production
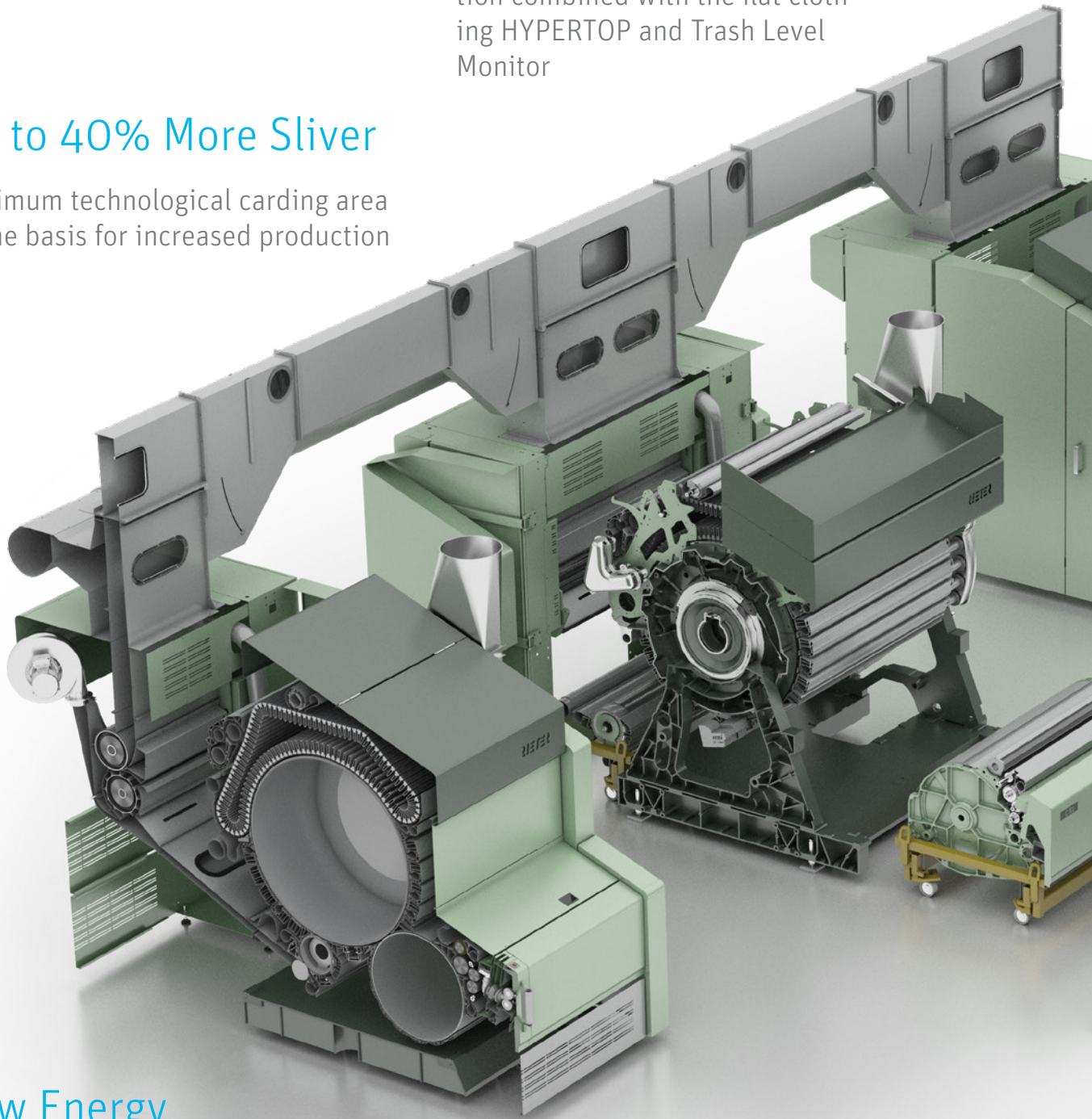
Low Energy Consumption

High production with fewer cards, energy-efficient drives and innovative machine components

Suitable for All Applications

Special machine solutions for recycling and man-made fiber processing

C 81

OUTSTANDING
ADVANTAGES

Unmatched Sliver Quality
Thanks to Unique Technologies

Permanent monitoring with Carding Gap Control
and Trash Level Monitor, premium Graf wires
and Integrated Grinding System (IGS)

Easy Maintenance
and Flexible Operation

Modular construction, folding doors for quick
access, Q-Packages and an easy removable
central suction system

The Best-in-Class
Process Shortening

Draw frame module RSB-Module 55
with unique technology
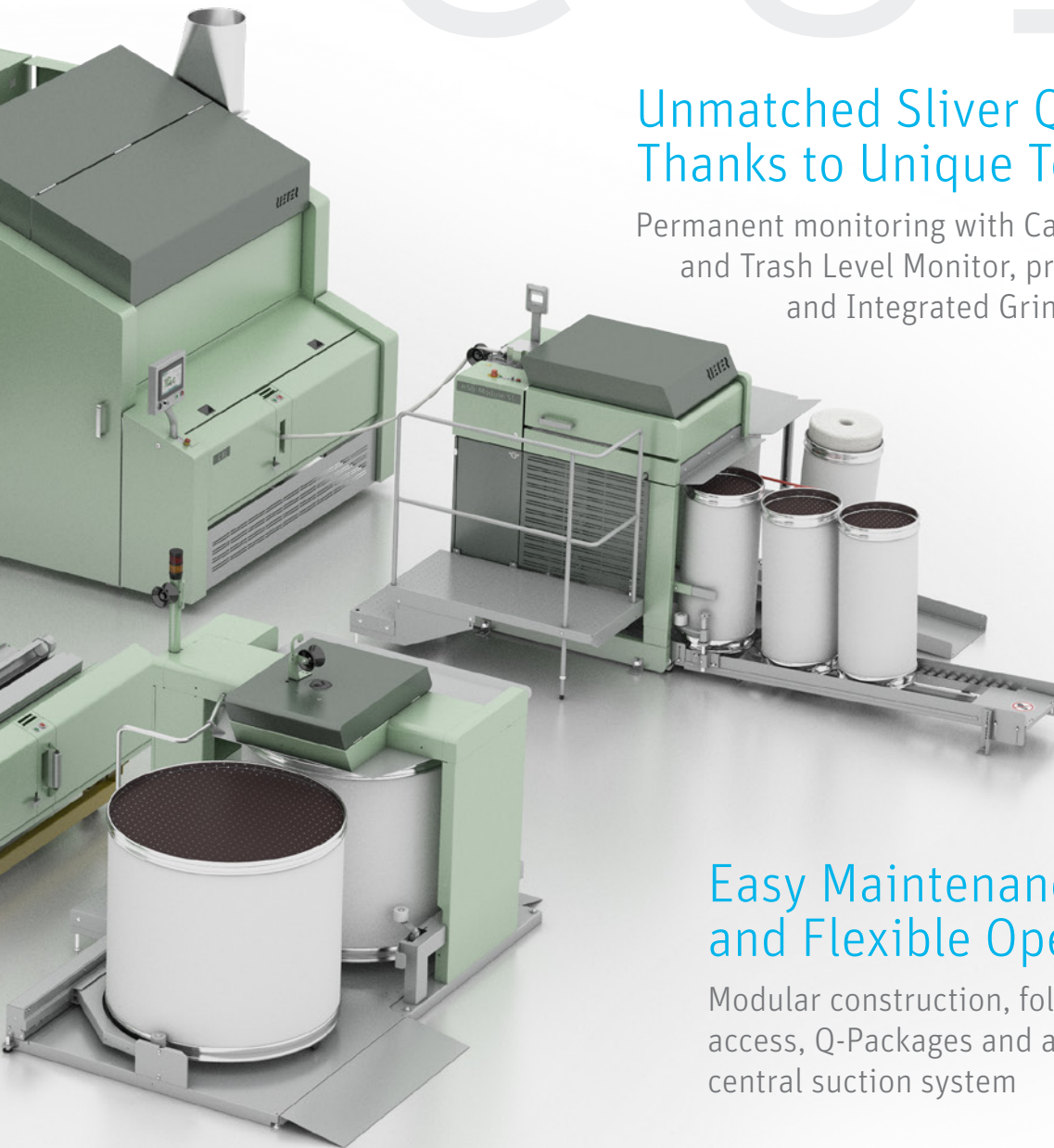
Productive and Intelligent

Up to 40% more production

## Latest carding technology for highest production

The card C 81 takes a leap forward in terms of high production and excellent sliver quality. This is made possible by the new intelligent feature Carding Gap Control which constantly ensures the ideal carding gap for unmatched sliver quality. With Trash Level Monitor, further intelligent sensors are used to monitor the material quality at the card infeed and after sliver formation. Each of these features contributes to up to 40% higher production than with any other high-performance card.

Key factor: Maximum technological carding area

The maximum technological carding area with 40 active flats and long pre- and post-carding zones is the basis for highest production.

By utilizing 307° of the cylinder circumference the C 81 features the longest carding length of 3.16 m. This is at least 12% more total carding length than any other card offers. Considering the working width, this results in 30% more carding area.

The number of flats in the operating position form the basis for the high production rate and optimum quality. This value is expressed by the Active Carding Index (ACI). In addition to the active flats, the working area of the card is also included in this calculation. The ACI is calculated by multiplying the working area in meters by the number of active flats. The higher the ACI value, the better the carding effect. Having an optimal ACI value increases both the productivity of the card and the quality of the card sliver.
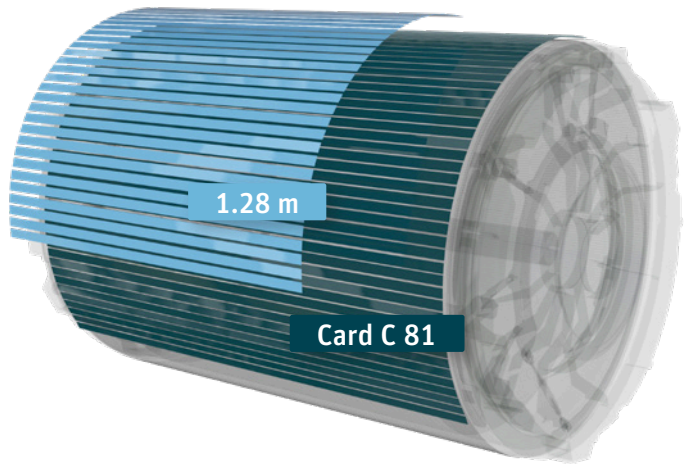
| Card	C 81	1.28 m
Total number of flats	116	84
Flats in operating position	40	28
Working area (m)	1.5	1.28
Active Carding Index (ACI)	60	35.8
Rieter advantage	68%	

Unmatched Sliver Quality

Unique technologies for excellent carding results

Carding Gap Control (CGC)*

The high-performance card C 81 is an innovation in terms of carding technology. The carding gap determines the carding quality. The narrower the gap, the better the nep reduction. The outstanding innovation Carding Gap Control uses the latest sensor technology to regulate the distance between flat and cylinder – with an accuracy of a few hundredths of a millimeter. This leads to an unmatched sliver quality.
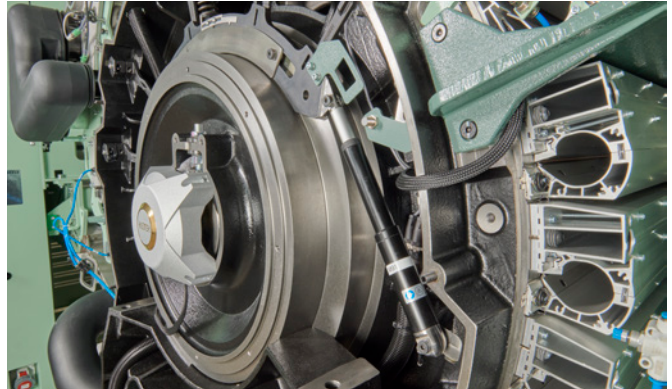
Benefits of Carding Gap Control (CGC)

Comparisons with and without CGC have shown:
- Excellent sliver quality at highest production
- Higher machine availability
- Constant control within defined threshold values

Automatic detection of ideal distance

With Carding Gap Control, Rieter is treading a new, forward-looking path: automatic detection of the ideal distance. For each of the 116 flats in use, the system detects the distance between the flat wires and the cylinder clothing. The intelligent software calculates the ideal carding gap, considering other important influencing factors such as the machine temperature. The carding gap is always kept within an optimum range via the electronic and centrally adjustable flat setting.

Carding gap   OK
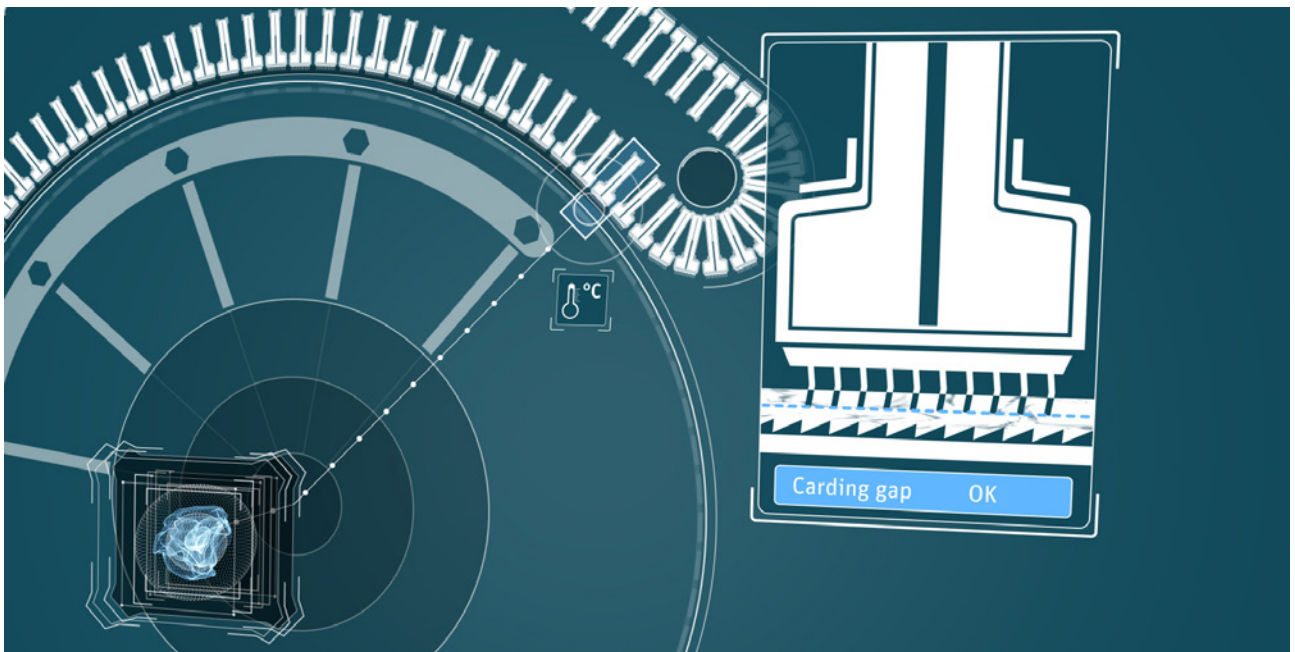
*option

Trash Level Monitor (TLM)*

Trash Level Monitor makes it possible to predict sliver quality within a defined range. Artificial intelligence is used to measure whether the trash particles in the card infeed and in the produced sliver is within the defined limit. If the limit is exceeded, this is displayed on the operating panel and recorded in ESSENTIALmonitor, Rieter's all-in-one mill management system, so that appropriate quality assurance measures can be initiated. Thus, the quality with respect to the trash level is always under control thanks to Trash Level Monitor.
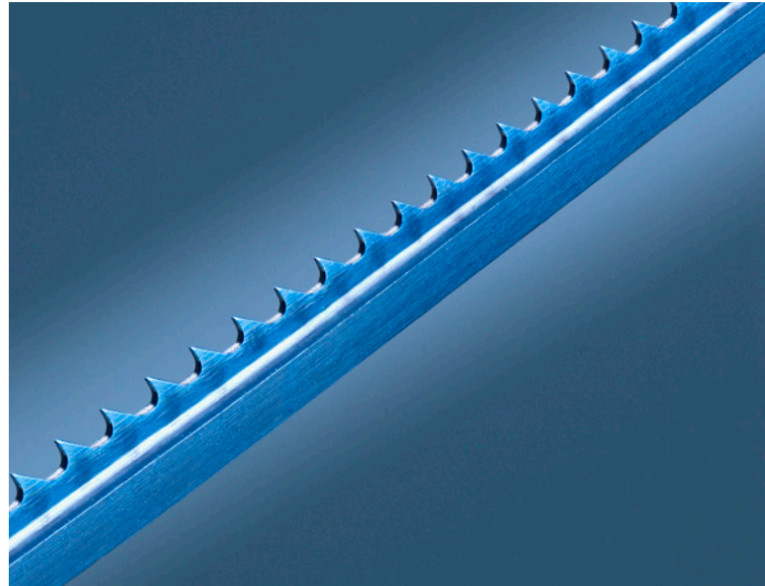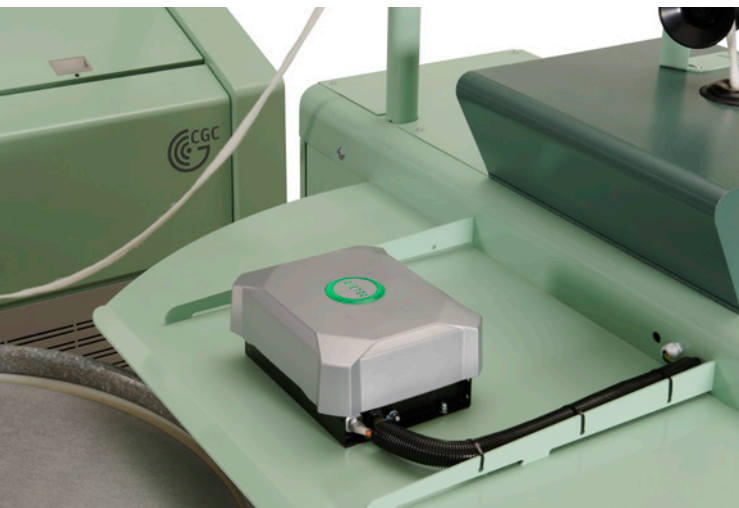
Premium Graf card clothing

Creating consistent yarn quality from raw materials that have significant variations is one of the daily challenges for spinning mills. The Graf portfolio offers ideal technology components for all applications and ensures the right combination of cylinder wires and flexible flats that perfectly operates cards to deliver the required sliver quality.

Rieter Quality Monitor (RQM)

Short-term leveling
The card infeed measures the thickness of the supplied batt. The speed of the card feed roller adjusts automatically according to the values determined, so that a uniform card sliver fineness is achieved.

Long-term leveling
The card sliver fineness is measured by a disk roller pair at the sliver delivery. The measured signals are processed and used to control the feeding system.

On the graphical operator interface quality data of the card sliver are displayed in real time.

*option

Integrated Grinding System (IGS)

The continuous wear of the card clothing becomes more important for highly productive cards. The Integrated Grinding System (IGS) – exclusive to Rieter – solves this problem right from the start by keeping the clothing permanently sharp.

IGS-classic

With IGS-classic, a grinding stone is automatically moved across the cylinder clothing during production. This operation is performed 400 times over the expected service life of the clothing. Spread over the service life of the cylinder clothing, the programming of the grinding schedule calculates the optimal distribution of the grinding cycles.
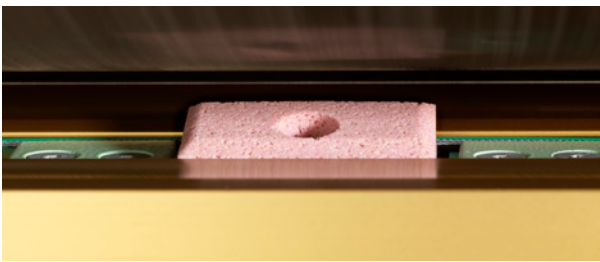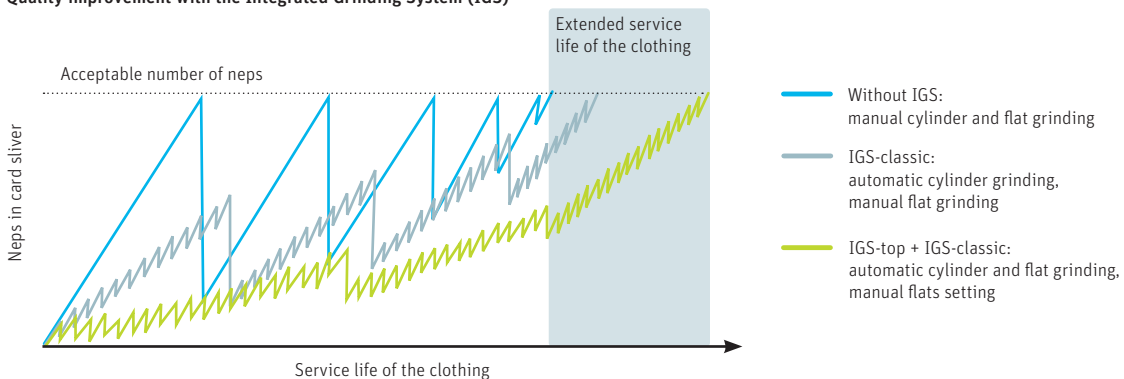
IGS-top

The optional IGS-top module sharpens the card flat clothing fully automatically. The control unit calculates the grinding cycles over the pre-selected service life of the card flat clothing. Numerous small grinding operations ensure that the quality is more consistent than in a flat grinding roller, with fewer, aggressive, manual grinding operations.
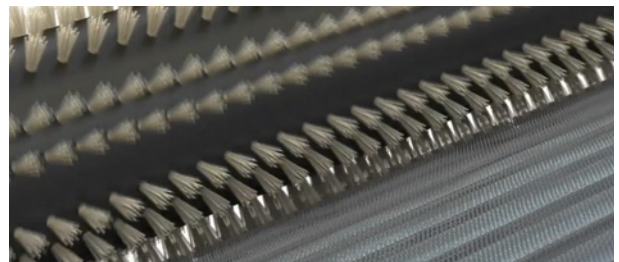
Benefits of IGS:
- Service life of cylinder clothing is extended by 10 – 20%
- Consistent quality level over time
- Lower maintenance requirements
- Machine downtimes for manual grinding are reduced

Quality improvement with the Integrated Grinding System (IGS)

Extended service life of the clothing

Acceptable number of neps

Neps in card sliver

Service life of the clothing

— Without IGS:
manual cylinder and flat grinding

— IGS-classic:
automatic cylinder grinding,
manual flat grinding

— IGS-top + IGS-classic:
automatic cylinder and flat grinding,
manual flats setting

Up to 2% Higher Yield

Technological cross section builds the foundation

Artificial intelligence improves raw material yield

Trash Level Monitor continuously monitors the trash content of the fiber tufts in the card infeed and the card sliver produced. By doing so, the spinning mill can maximize its raw material yield.

The core of this function is optical image processing with a neural network developed by Rieter. The data come from sensors in the card infeed and at the can coiler.

Artificial intelligence is used to measure whether the trash particles in the card infeed and in the produced sliver is within the defined limit values. In this way, the trash level is always under control and raw material utilization can be leveraged without exceeding the quality limits.
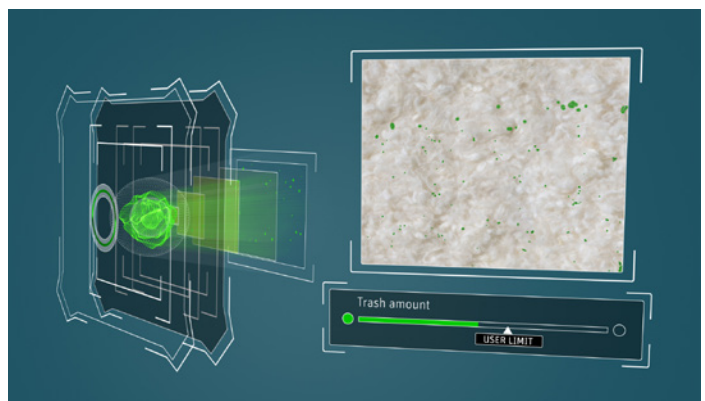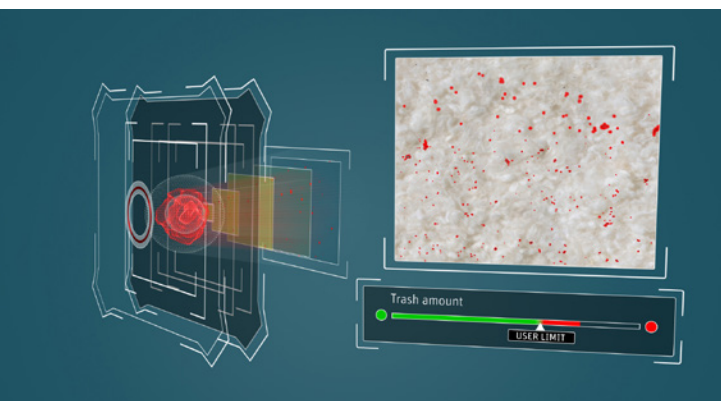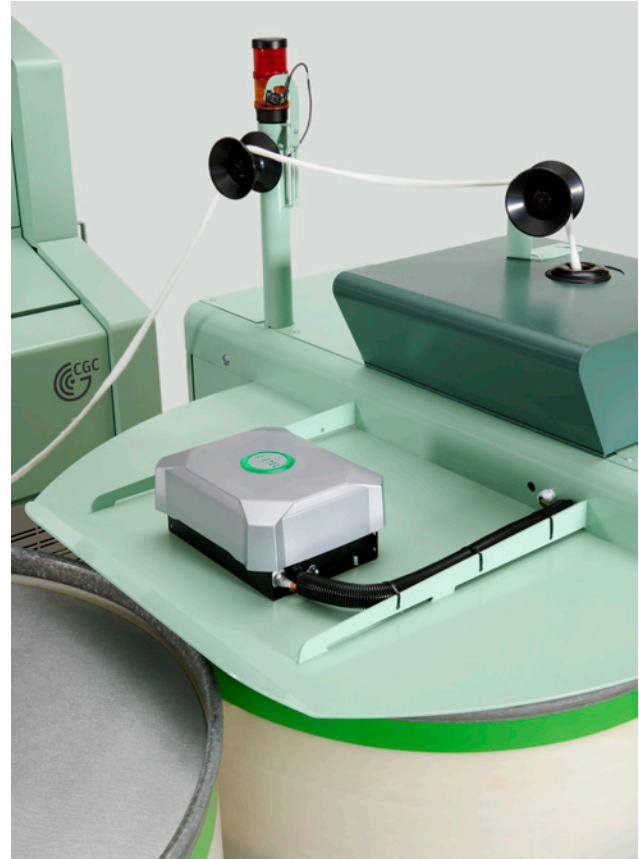
HYPERTOP from Graf*

The card clothing HYPERTOP from premium wire supplier Graf is available for the new generation of Rieter cards. Investigations show that HYPERTOP wires contribute to an improvement in fiber yield by up to 0.5%.

A strong wire and optimal teeth shape result in a constant high quality over an extended lifetime. The multi-zone setting pattern ensures optimal and gentle defibering. The progression from straight gaps to a gapless pattern processes the fibers with growing intensity, delivering the yield improvement.

The new setting pattern favors the removal of short fibers and waste as well as the elimination of neps. The savings resulting from HYPERTOP create a unprecedented return on investment.
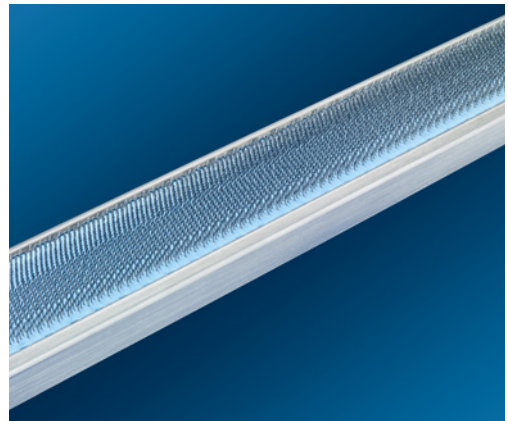
The technological cross section saves raw material

The C 81 has an innovative technological cross section with 40 active flats and the longest pre- and post-carding zones, so it is designed to use raw materials sustainably.

The preliminary opening of the fiber tufts in the long pre-carding zone allows the fibers to be delicately prepared for separation by the flats. In total, 40 flats are engaged and perform the active carding work. In the post-carding zone, fibers are settled and cleaned again, and all dust is removed. The long pre- and post-carding zones allow up to four Q-Packages to be used which ensure selective trash extraction. This feature means that the C 81 card can be specifically adapted to any raw material. This results in a reduced risk of fiber damage and the process uses less raw material. The card can also be equipped with a mote knife, a carding segment, and/or a fiber-guiding segment.
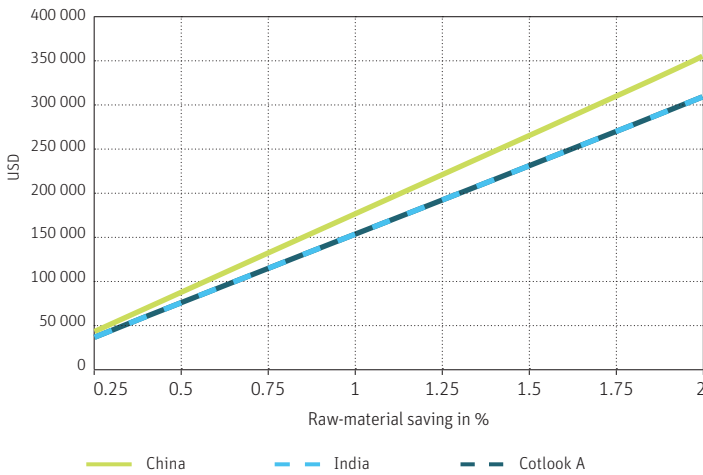
*option

15
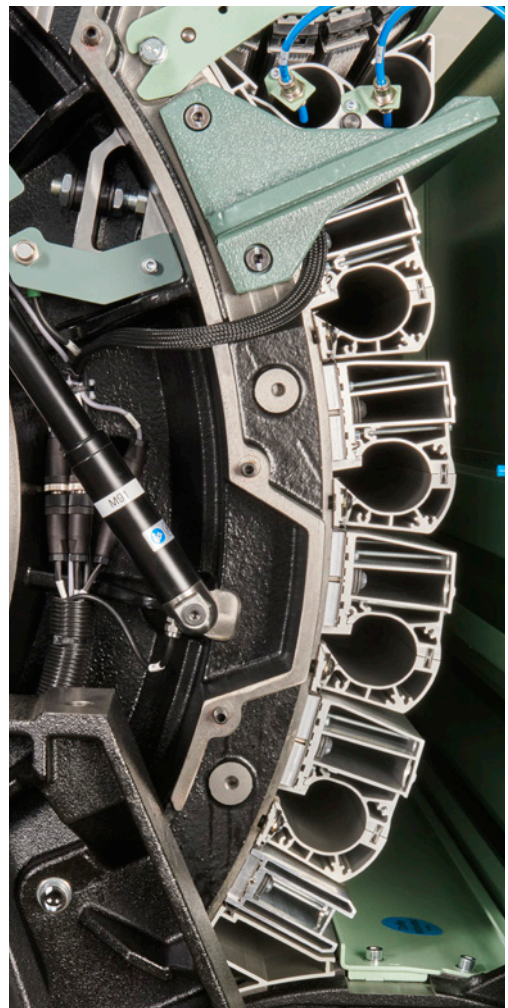
Potential for savings with selective trash extraction

With selective trash extraction, both raw material utilization and product quality expectations can be optimized. The material utilization offered by the C 81 is up to 2% better than other modern high-performance cards. This increased utilization creates a significant cost benefit.

The card C 81 features three elements that enable optimal material utilization and flexible adjustment to different raw materials:

1. Mote knife on the licker-in that can be electronically adjusted quickly during production.
2. Long pre- and post-carding zones in which the number of Q-Packages can be configured to meet technological and economical demands. Various inserts in the Q-Packages enable selective trash extraction.
3. The flat speed is infinitely variable; the speed that is set influences the selective trash extraction and carding result.

Profit in USD depends on where the cotton is sourced from
Basis for calculation: Card line with a sliver output of 900 kg/h at 8 400 operating hours

China — India — Cotlook A

What selective trash extraction means

The optimal raw material utilization resulting from the low-wear mote knife with differing extraction width in the pre- and post-carding zones is extremely profitable. Inserts can be replaced in the shortest possible time, without using tools. Four designs are available for the different degrees of contamination – open, fine, medium, and strong.
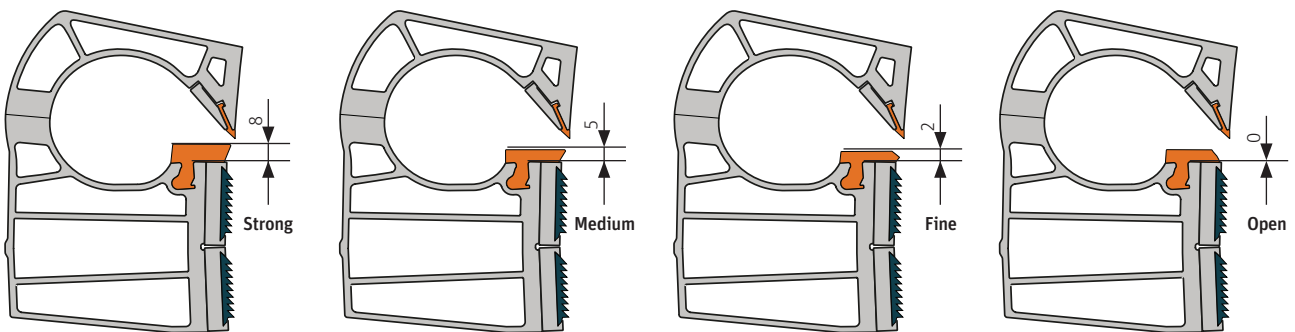
The four inserts are used to determine the relationship between good fibers and trash extraction.

Low Energy Consumption
Supported by energy-efficient drives

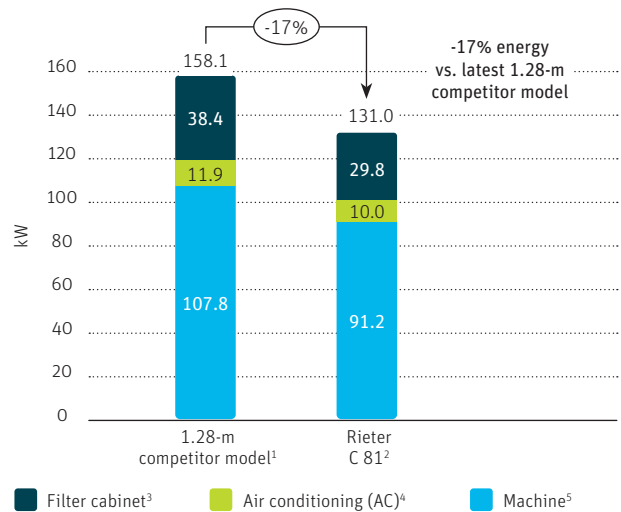## High production supports low energy costs

The card C 81 produces up to 40% more card sliver than any other cards currently available on the market. As a result, the number of cards required for a spinning mill can be significantly reduced. For example, only eight C 81 cards are needed for 900 kg/h card sliver production, whereas ten 1.28-m cards from a competitor would be required. This results in an energy saving of 17%. Furthermore, the card C 81 is equipped with state-of-the-art energy efficient drives which meet the latest energy standards.

Some of the most important energy-efficient features are:

- Design of suction system which allows a low suction pressure
- Machine design that prevents heat generation which in turn reduces AC-cycles
- Innovations in the flats area with a precisely controlled carding gap

In addition, the C 81 can be equipped with an energy monitoring package that transmits energy consumption data to the mill management system ESSENTIAL, Rieter Digital Spinning Suite. This feature makes it easy to monitor energy consumption in real time.

Comparison of energy consumption between C 81 and competitor
Example cotton ring carded/combed yarn Ne 30, 900 kg/h total card production

-17%

-17% energy vs. latest 1.28-m competitor model

| | Filter cabinet[3] | | Air conditioning (AC)[4] | | Machine[5] |

[1] 10 machines, [2] 8 machines, [3] Energy consumed by the exhaust air filter,
[4] Energy consumed by the AC due to the heat generated by the machines,
[5] Energy consumption of the machines

Easy Maintenance and Flexible Operation

Modular solutions and sensors increase productivity

Modular solutions

Modular solutions increase productivity. Replacing the opening roller clothing in the card chute, the licker-in clothing, and the doffer clothing requires time-consuming maintenance work in conventional carding solutions. The modular design of the C 81 reduces these downtimes.

Comprehensive and ergonomic improvements further ensure user-friendly operation.
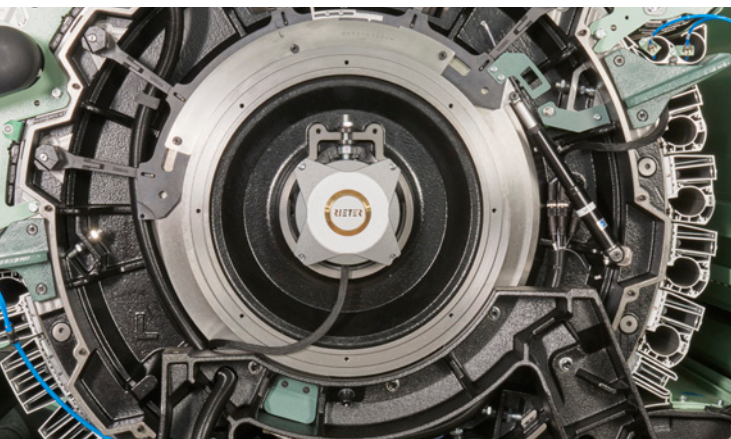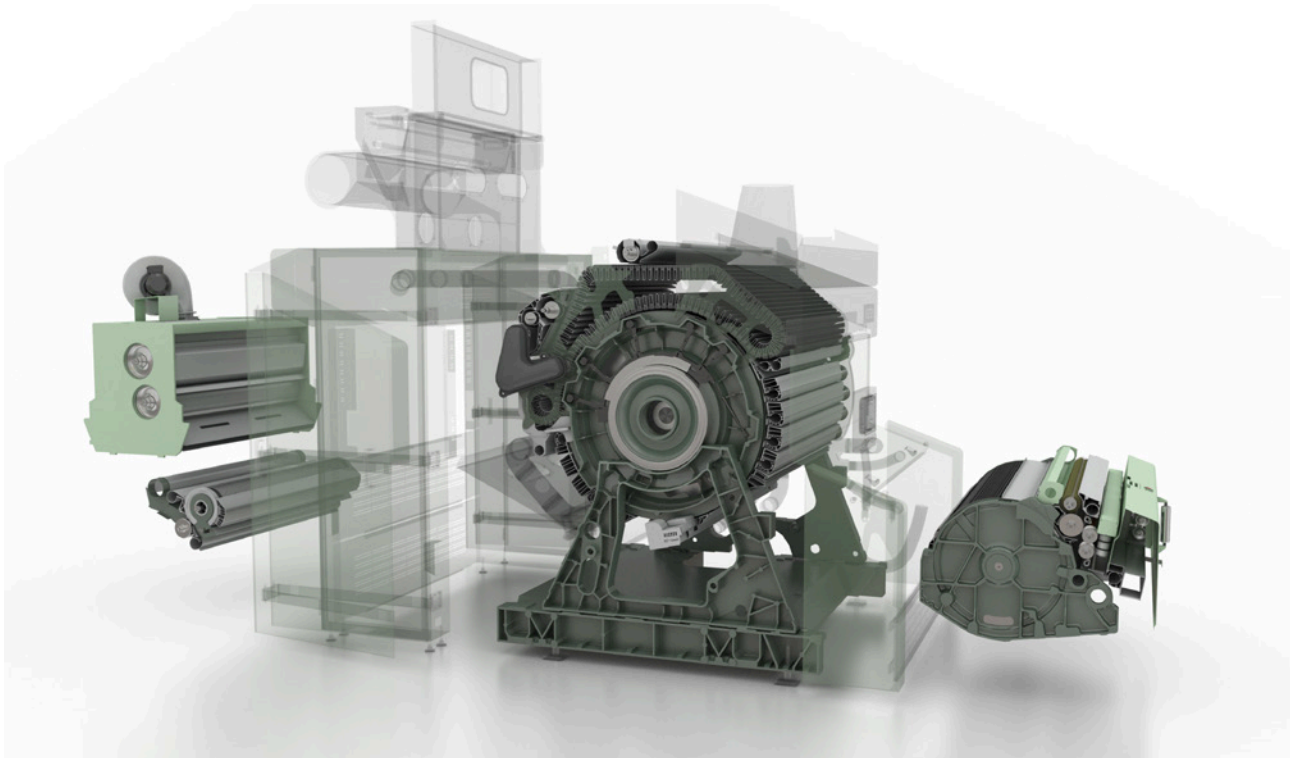
Sensor technology for easier setting adjustments

When machine conditions or processed materials change, the Carding Gap Control (CGC) independently adjusts the settings of the machine.

With its real-time trash analysis, the Trash Level Monitor (TLM) supports the conversion from one material to another to the targeted quality parameters.

Large capacity sliver cans reduce idle time

For the card sliver coiler, Rieter offers cans with a diameter of 1 200 mm. The capacity of the cans is 43% higher than for cans with a diameter of 1 000 mm.

This minimizes the number of can transports and sliver piecings in downstream processes. Workflows and costs in the spinning mill process are therefore optimized. Two different layout variations of the sliver coiler are available to ensure optimal placement in the building.
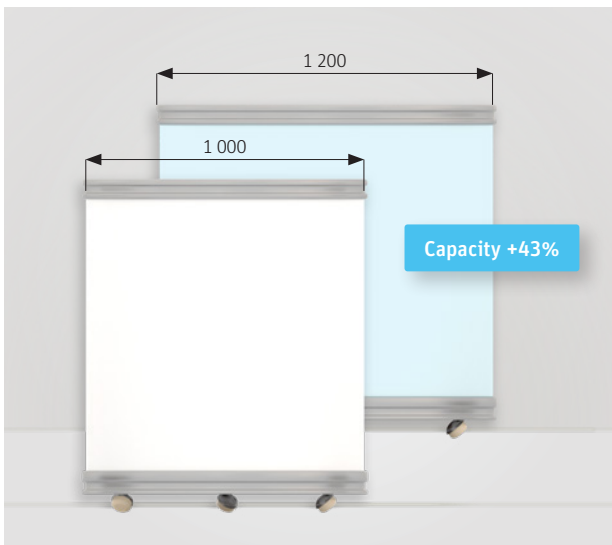
Metal and solid matter detector for safer operation

A special combined metal and solid matter detector at the card infeed detects even the smallest metal parts and stops the machine in time.

Problematic foreign objects and metal parts can be easily removed. This increases the availability of the cards and ensures reliable production. This combined detector can recognize both small and large foreign objects by carrying out a patented process in which large objects are detected first, followed by smaller ones.
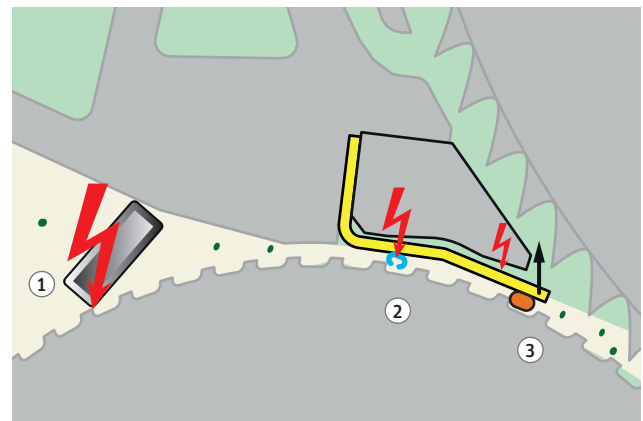

Detection of metal and solid matter in stages
1. Large metal objects
2. Small metal objects
3. Non-metal foreign objects

AEROfeed Control

AEROfeed Control ensures that fiber material continues to come down the card chute in the event of a machine standstill. Isolating the inactive machine keeps conditions in the carding line consistent and prevents dirt deposits from forming in the upper card chute of the machine that is at a standstill. When the machine is restarted, it continues production with the same level of quality.
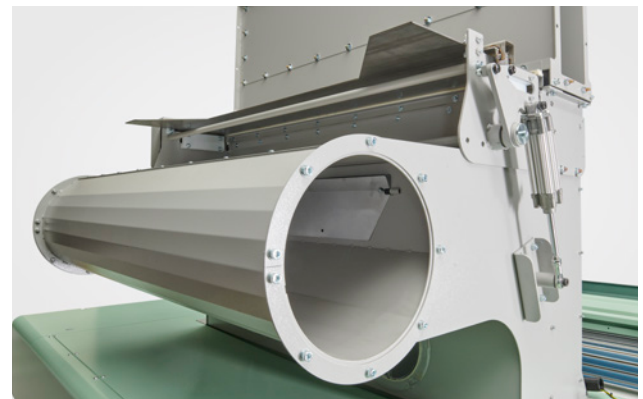
C 81 with RSB-Module 55

## New benchmarks in process shortening

The autoleveler draw frame module RSB-Module 55 is directly connected to the card. It is based on the proven drive and drafting technology of the autoleveler draw frame RSB-D 55. In addition, the draw frame module features a completely new type of scanning technology for autoleveling and monitoring of the delivered card sliver. This guarantees even better card sliver and yarn quality.

The RSB-Module 55 improves the efficiency of the spinning mill by reducing the number of draw frame passages. One example is the direct process in rotor spinning where the card C 81 with RSB-Module 55 is directly followed by the rotor spinning machine. This process is particularly suited for processing material with a high short-fiber content or recycled fibers.

High-frequency technology for precise autoleveling

The feed speed of the card sliver is significantly faster on the RSB-Module 55 than on an autoleveler draw frame due to the lower total draft. Another difference to the autoleveler draw frame is that only a single sliver is scanned.

Both cases increase the demands on scanning accuracy. The innovative technology integrated in the RSB-Module 55 meets these demands by a contact-free scanning of the sliver. This sensor technology results in more accurate scanning values and more precise autoleveling, and ultimately better sliver and yarn quality.
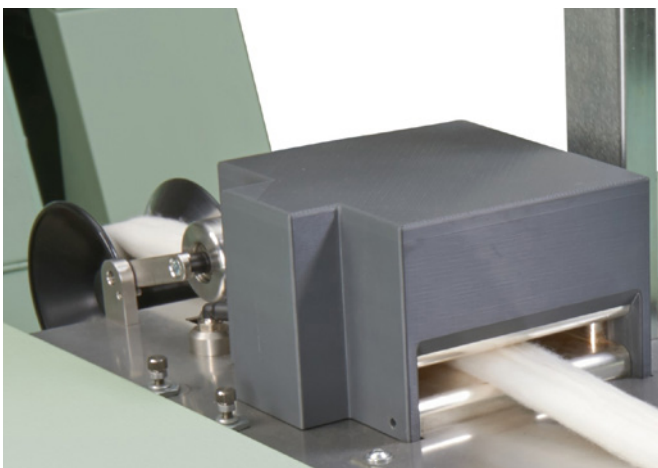
Autoleveler principle with new high-frequency sensor

C 81 – Solutions for Recycling Applications

Various features support ideal processing of recycled material

1. **Largest active carding area**
   The basis for up to 300 kg/h production

2. **Metal and solid matter detector – Safe machine operation**
   Protects the main carding area against wire damage. Constant resistance measurement monitors the card infeed and stops the material feeding if needed.

3. **Intensive tuft opening at licker in**
   Sawtooth clothing is recommended, removing of non-conforming material

4. **Long pre-carding zone – Intensive material opening**
   Enables safe intensive opening with simultaneous gentle treatment of recycled fibers, including yarn and fabric remnants

5. **Premium Graf clothing**
   Graf clothing sets: Flexible flats for recycled raw material, semi-rigid flats are recommended for some special applications.

6. **Easy cleanable web bridge** – Debris from colored recycled material can be quickly removed, thus ensuring a perfect web.

7. **Reliable sliver guidance** – Maximum card sliver quality at highest delivery speeds (500m/min) Reliable sliver guidance especially for critical recycling applications. Guiding lips on cross aprons, three pre-funnels for gentle and progressive condensing of the sliver, stepped roller for sliver compression

8. **Process shortening with RSB-Module 55**
   Flawless leveling of card sliver with a high short-fiber content
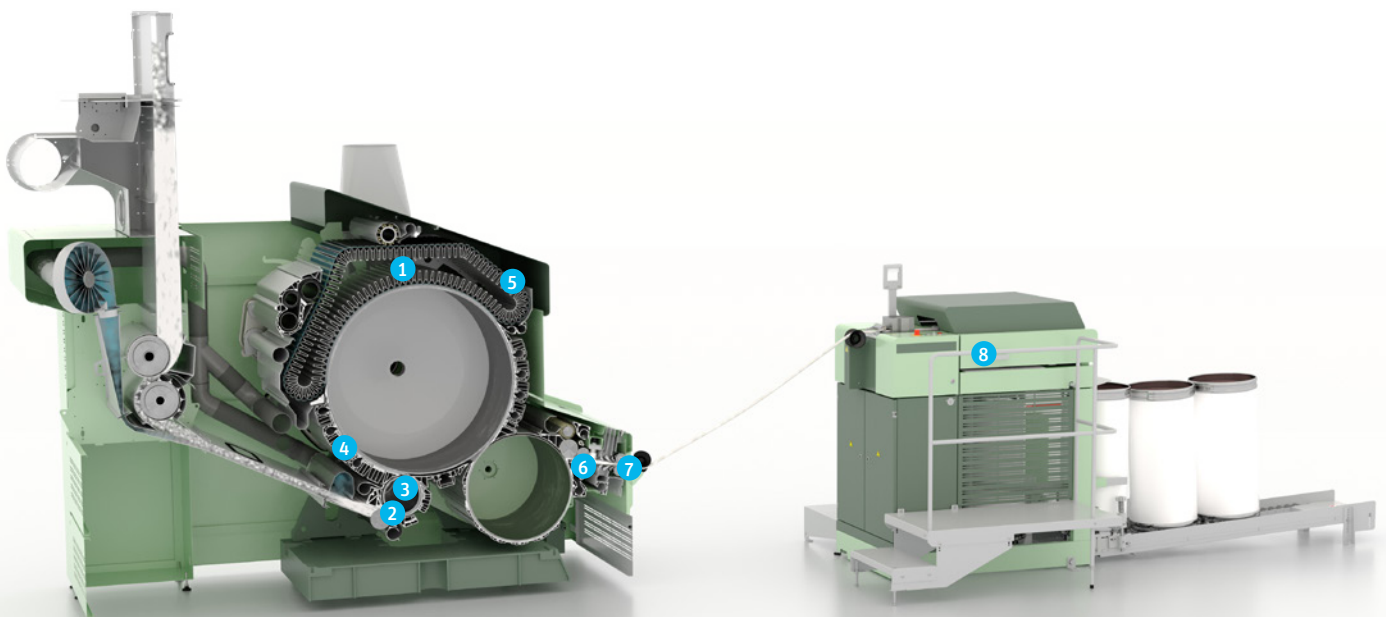
C 81 – Solutions for Man-Made Fiber Applications

Perfectly adapted features support ideal processing of man-made fibers

1. Largest active carding area for highest productivity
40 active flats are the basis for highest production

2. Long pre-carding zone
Gentle and gradual tuft opening preserves the fiber properties

3. Closed pneumatic feeding system
For reliable feeding of any kind of man-made fibers

4. Doffer unit design
Perfect sliver guidance for maximum card sliver quality at highest delivery speeds (500m/min)

5. Easy cleanable elements
Low downtimes when removing spin finish accumulations:
- Easy removable web bridgeCLEANcoil PES for less cleaning, more consistent sliver and yarn quality, good downstream performance.
- Special coating for 100% PES fibers:
At least 100% longer cleaning cycles even with demanding PES fibers
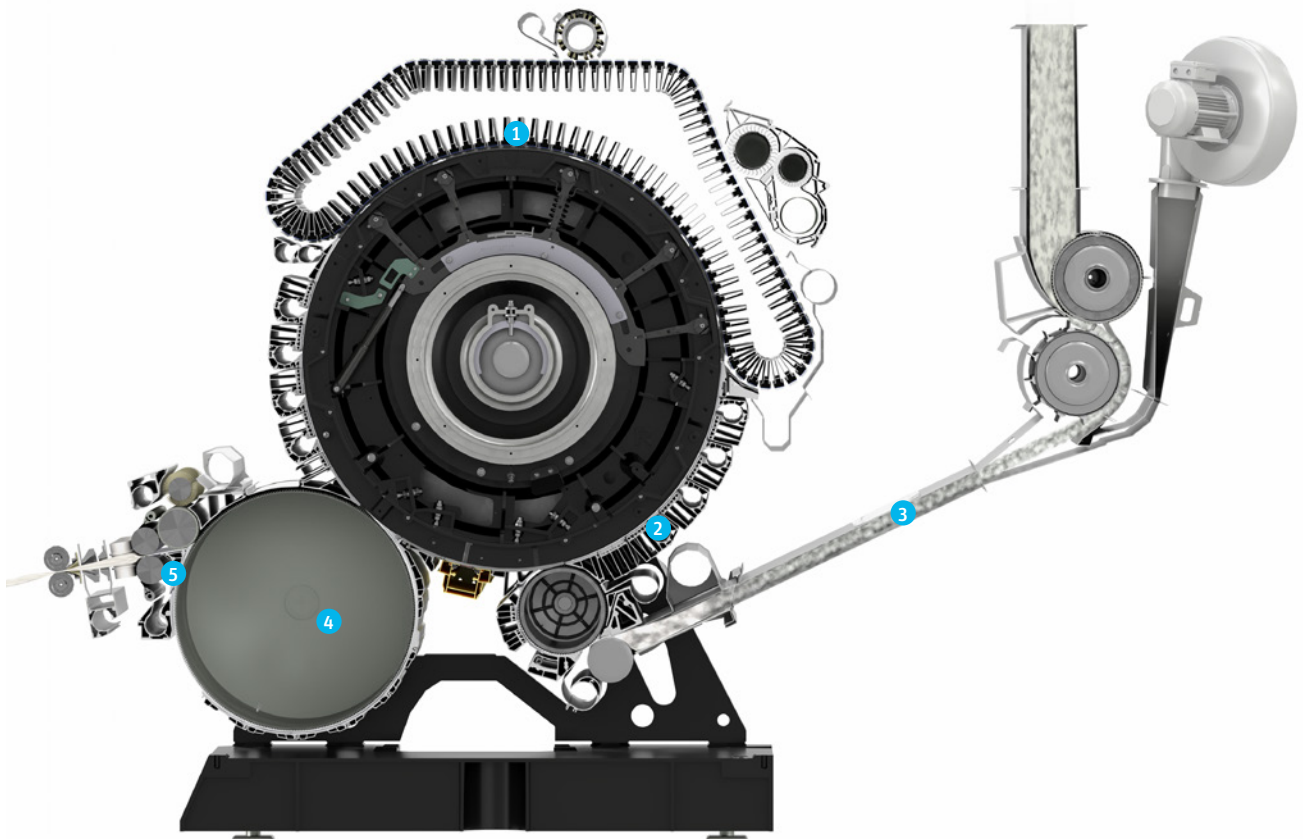
ESSENTIAL – Rieter Digital Spinning Suite

Rieter's all-in-one mill management system

ESSENTIAL leverages digital technology for the textile value creation. The Rieter Digital Spinning Suite analyzes data of the entire spinning mill in real-time and provides meaningful key performance indicators based on this.

With comprehensive and clearly arranged digital analysis, the system supports management in strengthening the expertise of mill staff, eliminating inefficiencies and optimizing processes across the entire system. Through its holistic approach, ESSENTIAL connects the dots in the spinning mill.

ESSENTIAL is a modular system, so the spinning mill can be gradually digitized.

Customer value	Modules	
Mill optimization	ESSENTIALpredict	ESSENTIALoptimize
Mill control	ESSENTIALmaintain	
Mill operation	ESSENTIALmonitor	
Mill management	order consult mill … ESSENTIALbasic	

Available modules   Future modules

Modular set up of ESSENTIAL
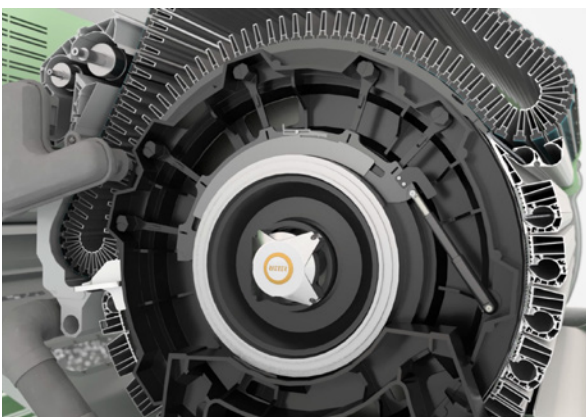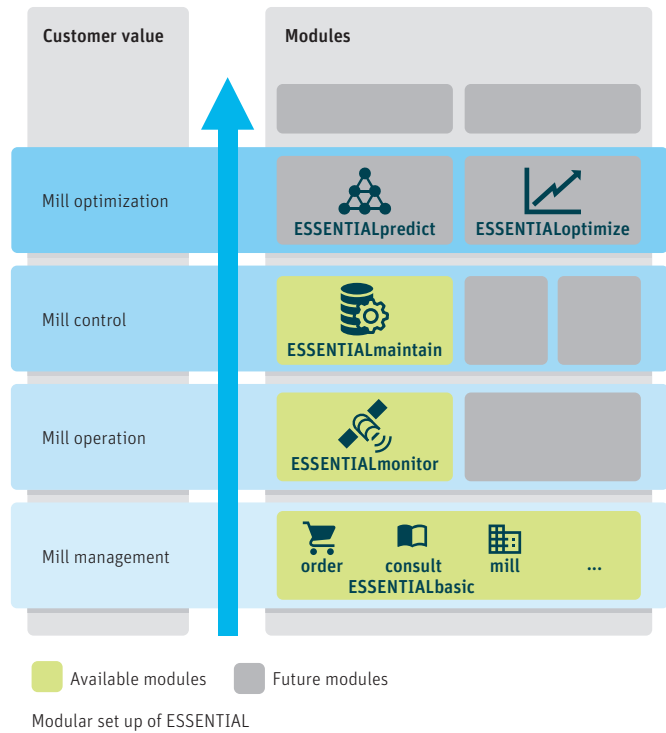
Animation about the card C 81

Animation card C 81

High-performance card C 81

Scan the QR code for more information
https://l.ead.me/bdzXc9

Machine Data
Card C 81
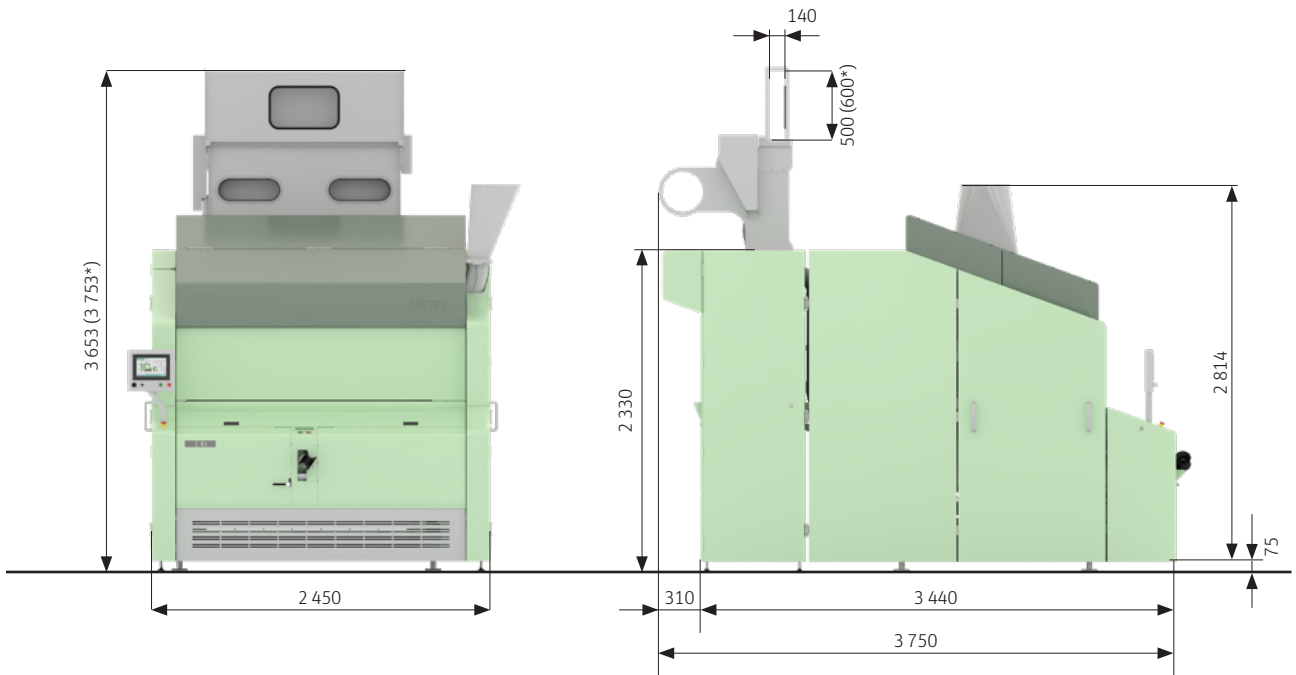
Technological data	
Raw material	Cotton and man-made fibers up to 65 mm
Production	up to 300 kg/h
Card sliver count	4 – 12 ktex
Batt weight	550 – 900 g/m
Technical data (C 81 without sliver coiling section)	
Installed power**	33.5 kW
Delivery speed	up to 500 m/min
Compressed air	0.7 Nm³/h
Exhaust air	1.10 m³/s
Waste removal	Central suction, separate licker-in waste disposal
Cylinder speed	340 – 650 rpm
Machine data	
Machine length	3 440 mm
Machine width	2 450 mm
Machine weight (with standard chute)	9 200 kg
Working width	1 500 mm

* JUMBOfeed
** with FC (frequency converter), including card chute

Card C 81 with sliver coiling section with 1 000-mm can diameter

Dimensions (mm): 2 450 | 3 750 | 1 262 | 1 500 | 267 | 239 | 2 295
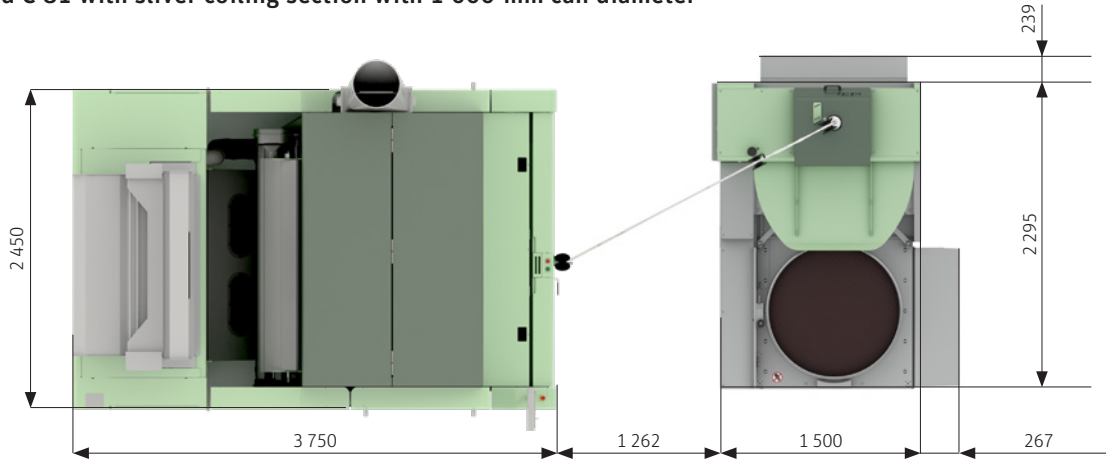
Technical data: sliver coiling section CBA	
Installed power	1.5 kW
Compressed air	0.05 Nm³/h
Exhaust air	0.1 m³/s
Can heigth	1 200/1 300/1 500 mm

Card C 81 with sliver coiling section with 1 200-mm can diameter

Dimensions (mm): 2 450 | 3 750 | 1 200 | 1 930 | 379 | 243 | 2 800 | 1 855
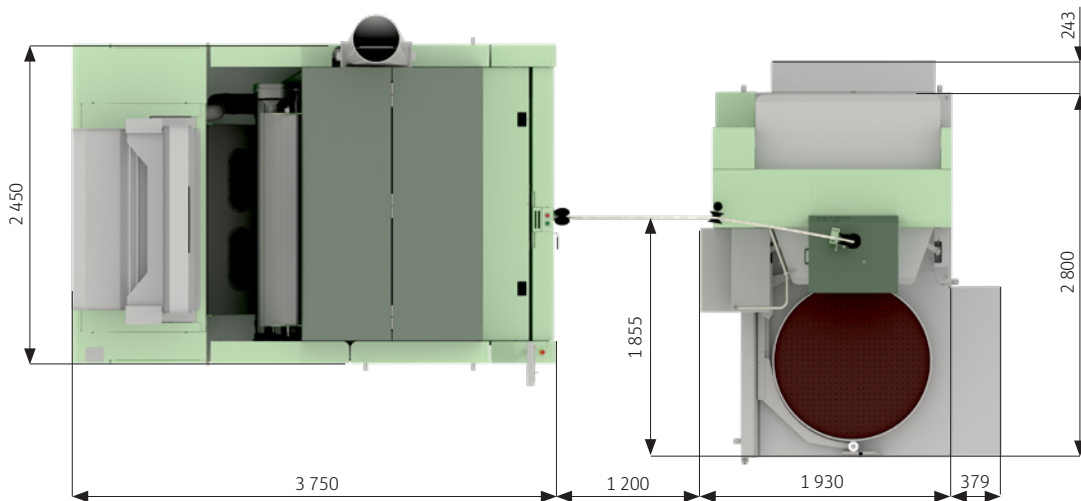
Technical data: sliver coiling section for 1 200-mm cans	
Installed power	2.32 kW
Compressed air	0.05 Nm³/h
Exhaust air	0.1 m³/s
Can heights	1 200/1 300 mm

Card C 81
with RSB-Module 55
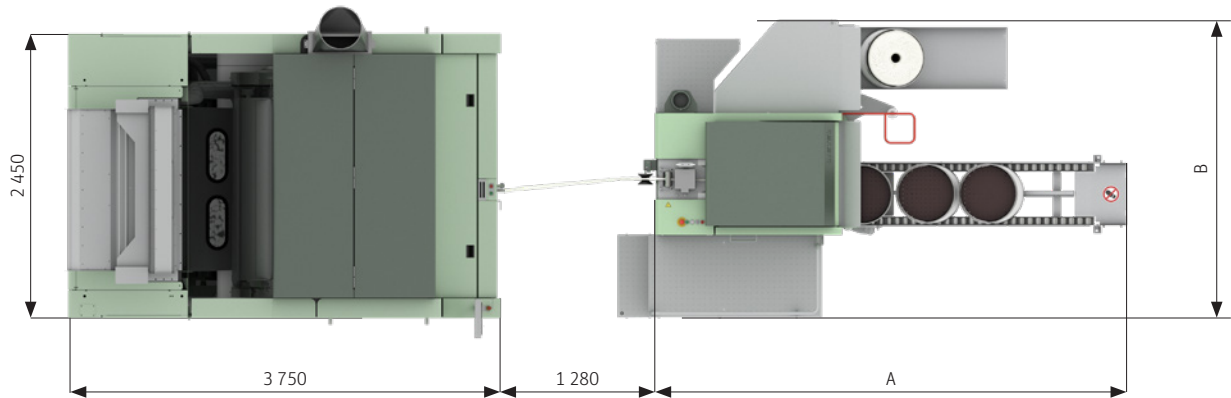
	Empty can magazine, cans with castors		
Cans ⌀ [mm]	Number of empty cans	Measurements [mm]	
		A	B
400	5	4 765	2 320
420	5	4 765	2 320
450	4	4 565	2 320
470	4	4 565	2 380
500	4	4 765	2 380
600	3	4 814	2 380

	Empty can magazine, cans without castors		
Cans ⌀ [mm]	Number of empty cans	Measurements [mm]	
		A	B
400	5	3 885	2 320
420	5	3 885	2 320
450	4	3 885	2 320
470	4	3 885	2 380
500	4	3 885	2 380
600	3	4 750	2 380

Technical data RSB-Module 55			
Delivery speed	Maximum 900 m/min	Installed power	9.65 kW
Drafting system	4 over 3	Compressed air	0.22 Nm³/h
Total draft	up to five-fold	Exhaust air	0.28 m³/s

Card C 81		Impact on		
		Economy	Quality	Flexibility
Basic machine equipment				
Largest active carding area (1.5-m working width and 40 working flats)	standard	•••	•••	
Longest carding length (3.2 m)	standard	•••	•••	
Modular opening unit in the card chute	standard	•••		•••
Modular licker-in unit	standard	•••		•••
Modular doffer unit	standard	•••		•••
Highest card production rate up to 300 kg/h	standard	•••	•••	
Graf premium card clothing	standard	•••	•••	
Standard AEROfeed (for up to 8 cards in one line)	standard	••	•••	••
Jumbo AEROfeed (for up to 10 cards in one line)	option	•••	•••	••
Pressure regulation in the card chute	standard	••	•••	
AEROfeed Control (slider in the upper card chute)	option	••	••	
In-feed system, 1 licker-in	standard	•••	•••	
In-feed system, 1 licker-in with needle roller	option	•••	•••	
Electric licker-in knife adjusting system	standard		•••	•••
Separate licker-in intermittent trash extraction	option	•••		
Energy-efficient central suction system	standard	•••		
Monitored continuous central suction upward	standard	••		
Monitored continuous central suction downward	option	••		
Infinitely adjustable speed control for flats	standard		•••	•••
Precise central carding gap adjustment in increments of 0.01 mm	standard		•••	
Infinitely adjustable speed control for cylinder and licker-in	standard	•		•••
Easy card accessibility for maintenance thanks to folding doors	standard	•		•••
Automatic linear can changer for 1 000-mm cans	standard	••	••	
Automatic linear can changer for 1 200-mm cans	option	•••	•••	

Card C 81		Impact on		
		Economy	Quality	Flexibility
Basic machine equipment				
Can changer mounted on floor	standard	••		•
Can changer recessed into floor	option	••		•
Easily interpretable signal column	standard	••	•	•
Connection to UNIcontrol	standard	•	•	•••
Connection to ESSENTIAL, the all-in-one mill management system	option	••	••	•••
Smart Solutions				
Combined metal and solid matter detector at infeed	standard	•••	••	
Integrated cylinder grinding device IGS-classic	standard	•••	•••	
Integrated flats grinding device IGS-top	option	•••	•••	
Easily removable web bridge	standard	••	•••	
Semi-automated sliver insertion	standard	••		••
Power monitoring	option	••		
Carding Gap Control (CGC)	option	•••	•••	•••
Trash Level Monitoring (TLM)	option	••	•••	•
RSB-Module 55 for process shortening	option	•••	•••	••
Web suction	option	•	•	••
Machine control				
Human Machine Interface (HMI)/Color touchscreen	standard			•••
Superimposing short- and long-term leveling system	standard	•••	•••	
Thin and thick place monitoring	standard		•••	
User guidance	standard	•••	•••	
Real-time spectrogram	standard		•••	
Maintenance and shift scheduling	standard	••		•••
Technology support				
Q-Packages with variable inserts	standard	•••	•••	•••
UNIcollect fiber/trash analyzing device	option	•••	•••	
Prepared for easy fiber/trash analyzing	standard			•••
Flat clothing HYPERTOP	option	•••	••	

Legend:
•   low impact
• • •   high impact

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