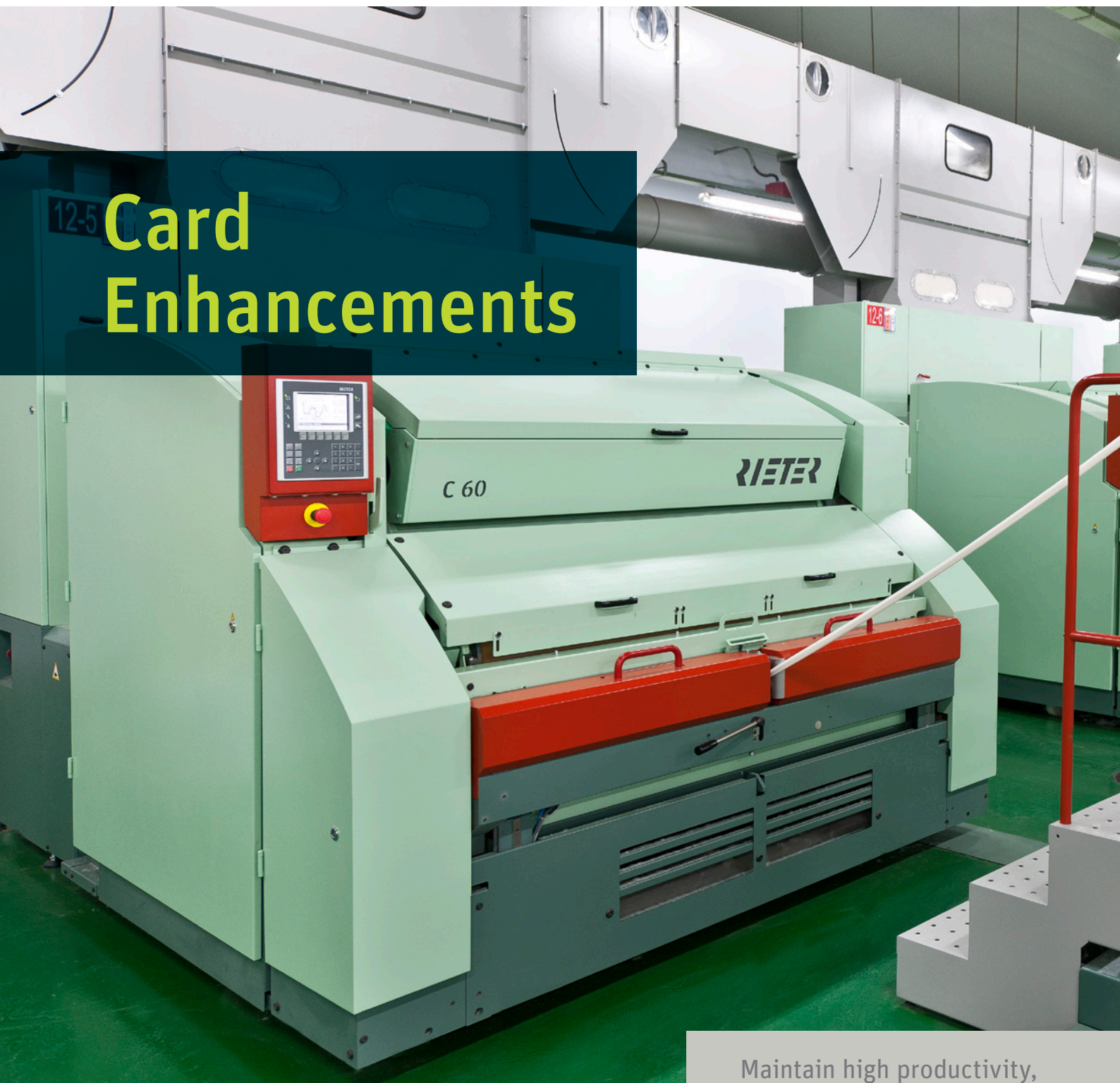


Fiber preparation
Service solutions for card C 60 and C 70

RIETER

Card Enhancements



Maintain high productivity,
ensure excellent sliver quality

Maintaining performance over the machine lifetime

Dear customer,

Thank you for being a valued Rieter customer. We appreciate the trust and confidence that you have in our products.

Since you are using one of our cards, you might have noticed that despite intensive care and maintenance, the performance of the card might have changed. Over the running period, wear and stress can deteriorate the performance of a machine. Those performance changes can include:

- Inconsistency in sliver quality
- Increased downtime
- Lint loss
- Poor efficiency
- Increase in sliver breaks
- Malfunction of electronics
- Downtime due to worn out parts

Rieter is constantly striving to support you with solutions that provide best-quality yarn at highest production rates. In order to optimize the performance of your card, we are happy to inspect your card and offer you improvements, that will enhance the performance of your card.

You can find examples for enhancement kits and their effect in the table on the right side.



Typical performance change	Enhancement	Value for customer	Reference
Inconsistency in sliver quality	Card chute pressure control	Improved sliver evenness	Page 6
High material losses	Q-package card	Up to 1.5% savings in raw material	Page 8
Inconsistency in sliver quality	IGS-classic and IGS-top	Up to 20% increase in clothing life	Pages 9, 10
Reduced price of flat waste	Separate licker-in waste disposal	Increased waste quality	Page 7
Increased downtime	New web bridge design & graphite lubrication	Up to 90% reduction in maintenance time	Page 11
Downtime due to malfunction of electronics or worn-out parts	Electrical and mechanical repair service	Reduced downtime	Pages 14, 15

Card Enhancement Overview

Improved carding performance and sliver quality through card enhancement kits for every application area

The card is the heart of the spinning mill and has a crucial impact on the final spinning process. The performance of the carding process depends on the individual process steps that achieve high production rates, as well as high discharge rates of waste and short fibers. To meet these high demands while keeping the card at the cutting edge of technology, Rieter proposes to optimize the individual process zones: chute 1, licker-in 2, main cylinder 3, flat 4 and doffer unit 5. The Q-package 6, which optimizes the pre- and post-carding zones located around the main cylinder, is a particular highlight as it helps achieve better sliver quality.

Increased Lifetime of Mechanical Parts

Inhouse or on-site preventive repair of key parts for increased lifetime. *Refer to page 14.*

Improved Feeding through Pressure Control

Pressure control in chute for consistent batt weight. *Refer to page 6.*

Enhanced Service for Electronic Parts

Preventive service of electrical parts for better performance and life. *Refer to page 15.*

Enabled Recycling of High Value Waste

Separating high value waste from low value licker-in waste. *Refer to page 7.*

Updated Lubrication System

Reduced maintenance and clean operation. *Refer to page 11.*

Integrated Grinding System – IGS

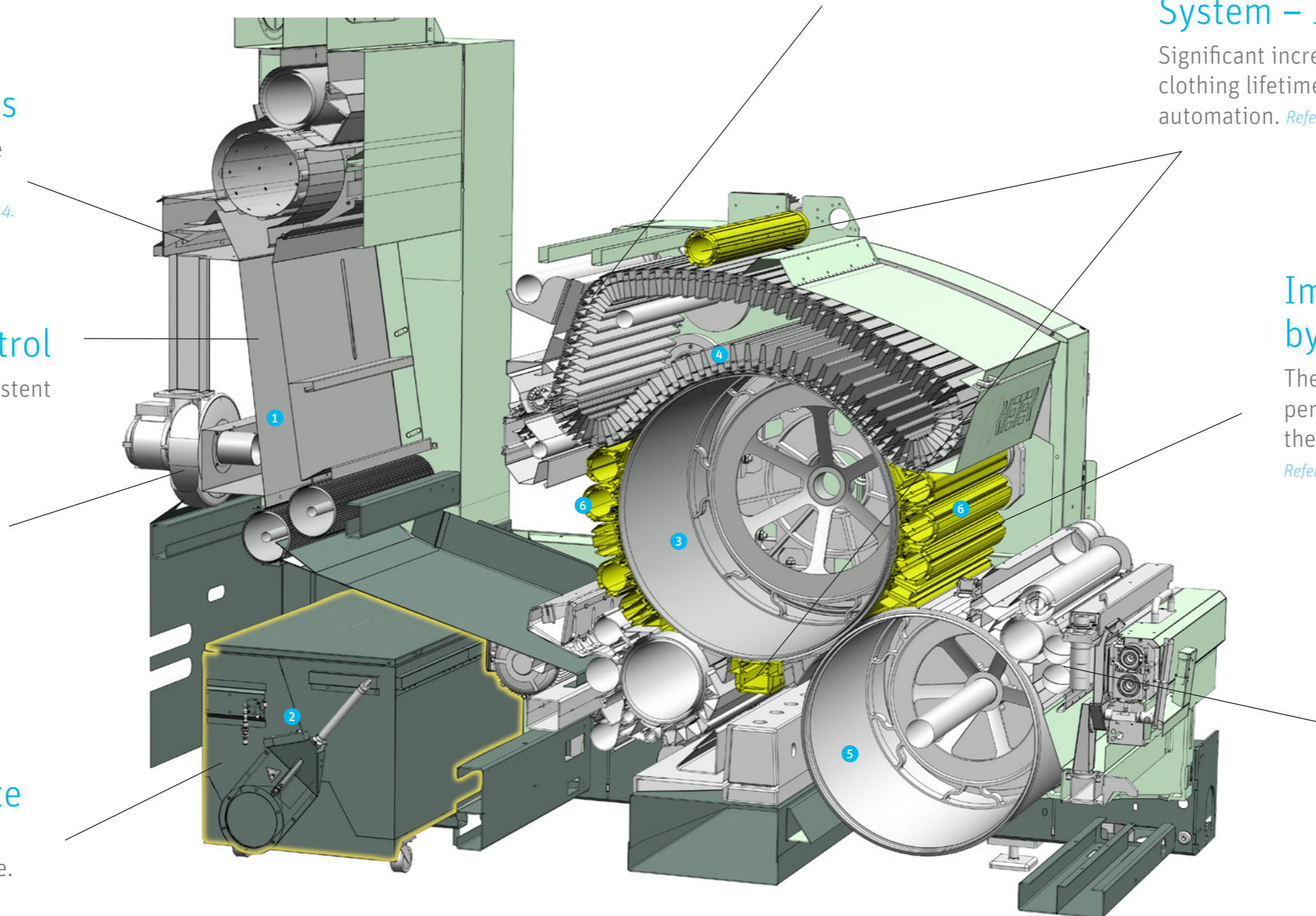
Significant increase of the card clothing lifetime thanks to automation. *Refer to pages 9, 10.*

Improved Quality by Q-Package

The success to raise the performance and quality of the end spinning machine. *Refer to page 8.*

Improved Delivery Unit

Less cleaning with the newly designed web bridge. *Refer to page 11.*



Pressure Control in Chute for Uniform Feeding

Superior regulation of the batt weight in the card chute

This is an upgrade for the chute and an adaption of the latest generation of cards. It replaces the existing conventional light barrier control system. The upgrade does not require manual intervention during production.

The new pressure control improves the running behavior, the so-called post-auto levelling of the card. The system manages the feed roller of the chute, based on the measured pressure in the chute. In addition, it regulates the batt weight irrespective of the material processed. This results in an improved filling quality in the chute and reduced fluctuations in the co-efficient of variation (CV%) value.

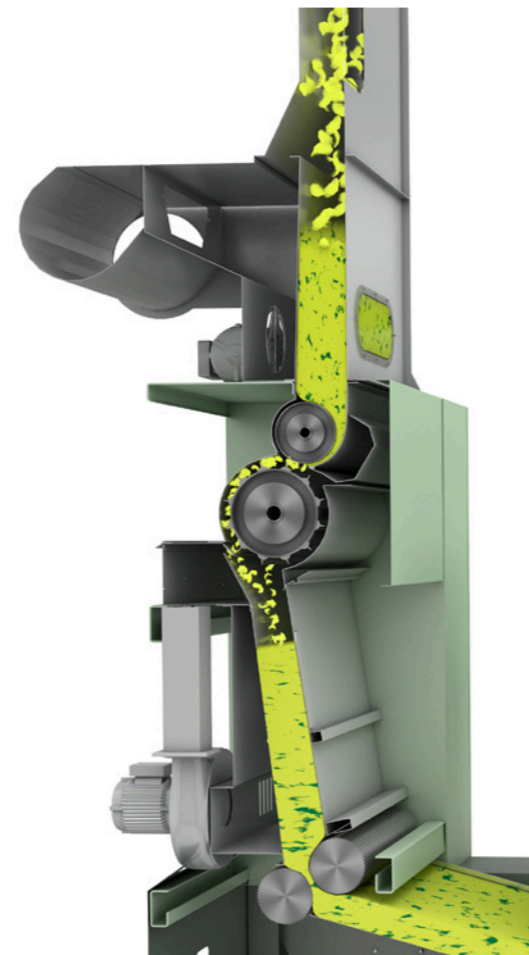
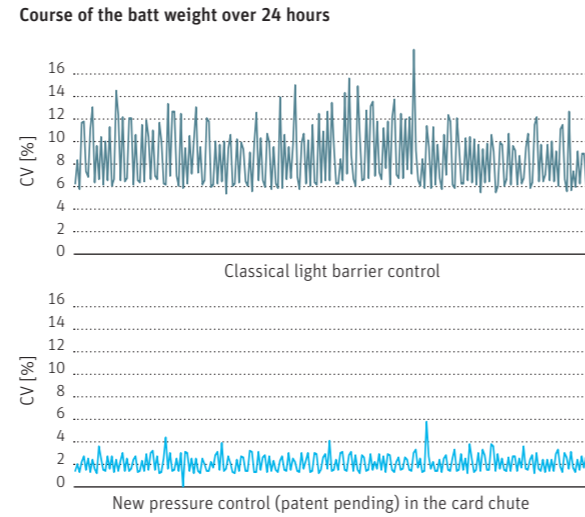
The graph shows the improved accuracy of the upgraded pressure control system compared to the conventional light barrier control system. It is visible that the repeatability of the batt weight is more accurate with the new system, and there is no large weight differences. Thanks to the new pressure control, the batt weight can be easily adjusted on the operating unit of the card. Furthermore, all settings can be transferred to other cards located in a spinning mill.

The shape of the feed plate has been redesigned to optimize the guidance of the batt and to avoid raw materials from collapsing or forming waves on the feed plate. A variety of feed plates is available depending on the raw material used. In addition, the front delivery roller includes a sealing lip to prevent contamination in the feed area.

For quick and reliable order processing, please refer to the compatibility overview on the pages 18 – 19.

Benefits

- Reduction of fluctuations of the CV% value by up to 70%
- Consistent material density in the card chute
- More flexibility through adjustment of the batt weight on the operating unit



Controlling the pressure of the feed chamber.

Separating High Value from Low Value Waste

Recycling high value waste

The separate licker-in waste disposal is an additional module to discharge the low-value licker-in waste separately from the high-value waste of the pre- and post-carding zone and flat unit. It needs a separate waste ducting system to transfer the licker-in waste from the disposal system to the centralized waste collection plant.

The collected waste from pre- and post-carding zone including flat unit can be resold as valuable raw material. Another option is to feed it into the spinning mill by means of a recycling line for the production of yarns.

The licker-in waste disposal module does not require additional air and it is energy efficient. It is easily possible to extract waste samples for visual assessments of waste composition. The licker-in waste collection box is delivered with wheels ensuring easy handling during maintenance and repair work.

Benefits

- Recycling of more valuable flat waste possible
- Increased sales revenue for higher-quality waste



Separate licker-in waste disposal 1 connected to the centralized waste collection plant.

Cylinder and Flat Unit Upgrades for Quality Improvements

Customized packages for every need

The main cylinder consists of three zones: the pre, main and post-carding zone. They open the tufts to single fibers by moving past mote knives, extraction and carding elements. As Rieter cards are able to process a wide range of materials, these elements can be customized for specific applications.

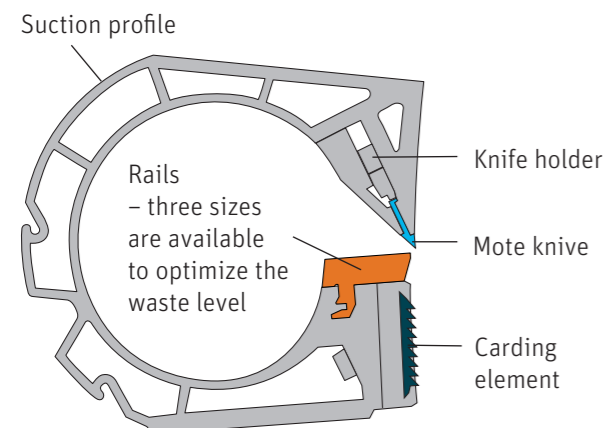
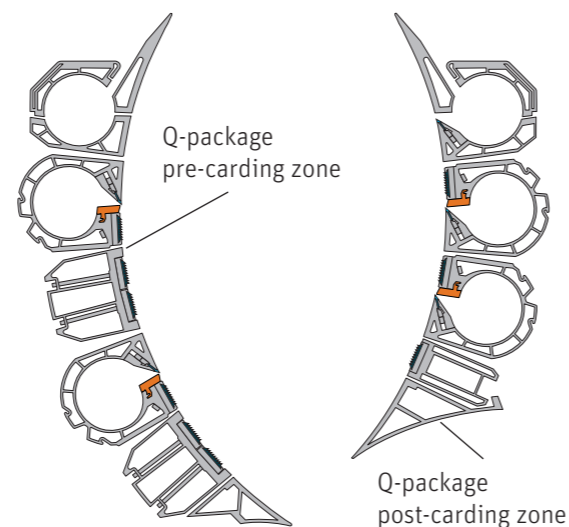
Upgrades in the processing zone of the main cylinder and replacement of parts in the licker-in module assure optimal processing of fibers.

Q-package for improved yarn quality

The Q-package includes profiles, rails, mote knives and carding elements. It helps open the fibers, remove neps and clean them further. As more impurities are extracted, the quality of the fiber is improved. The extraction amount and thus quality can be influenced by the extraction gap distance. The greater the gap, the more waste is removed and vice versa. Clean fibers ensure less wear and allow more efficient and gentler carding action in the main carding zone between the cylinder and flat unit. Based on the application and setting, up to 1.5% raw material can be saved.

Depending on the installed parts in the pre, main and post-carding zones and the material to be processed, the Q-package can vary. Through the configuration of mote knife and extraction elements, it is specifically adapted to the application. The optimum result is achieved by upgrading both zones.

To assemble the specific Q-package, Rieter requires the serial number and current machine settings. If the Q-package is already installed, replacing the mote knives and the extraction elements is key as they become blunt during production.



- Benefits**
- Flexible and adaptive package
 - Higher quality of the carded sliver
 - Long-lasting flat and cylinder clothing
 - Raw material savings up to 1.5%

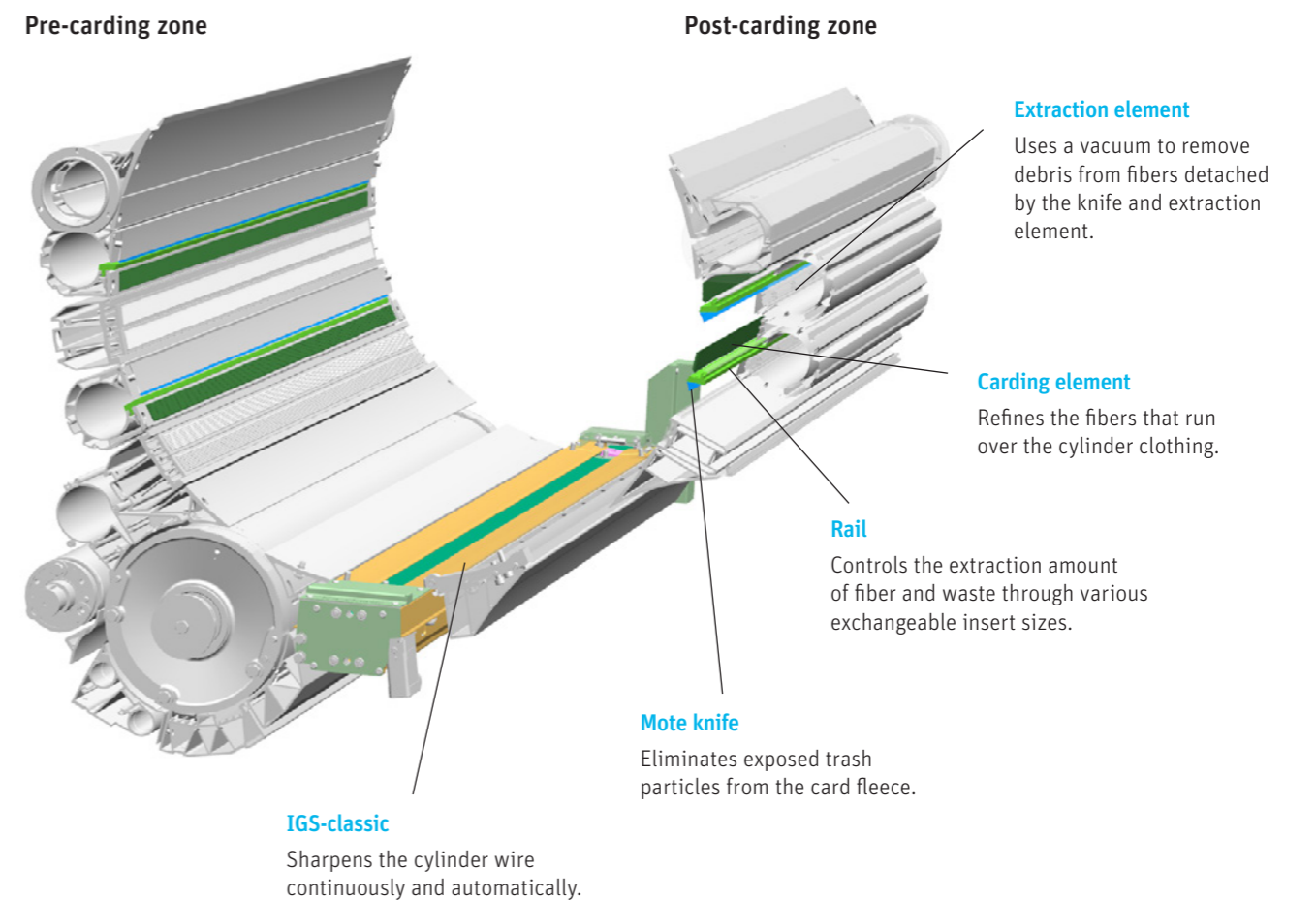
IGS-Classic and IGS-Top for Automatic Resharpener of Card Clothing

Consistent sharpening of cylinder wire

Maintenance of card clothing is essential for consistent yarn quality. The card clothing consists of metallic wires, flat clothing and stationary flats. They are subject to different mechanical stresses and thus need different maintenance approaches.

The licker-in faces the greatest stress due to the maximum trash removal rate. The rotating and stationary flats are therefore subject to high wear, requiring regular replacement. In the carding zone, the fibers are parallelized and the neps are removed. To assure consistent quality, the wires and flat clothing need to be sharp. Grinding operations can be carried out either automatically without intervention (Integrated Grinding System (IGS)-classic for cylinder and IGS-top for flat top) or conventionally with a machine stop and operator involvement.

With the IGS-classic conversion, the cylinder clothing is grinded during production, which allows the fibers to be parallelized even better, thanks to the perfect resharpened cylinder clothing.



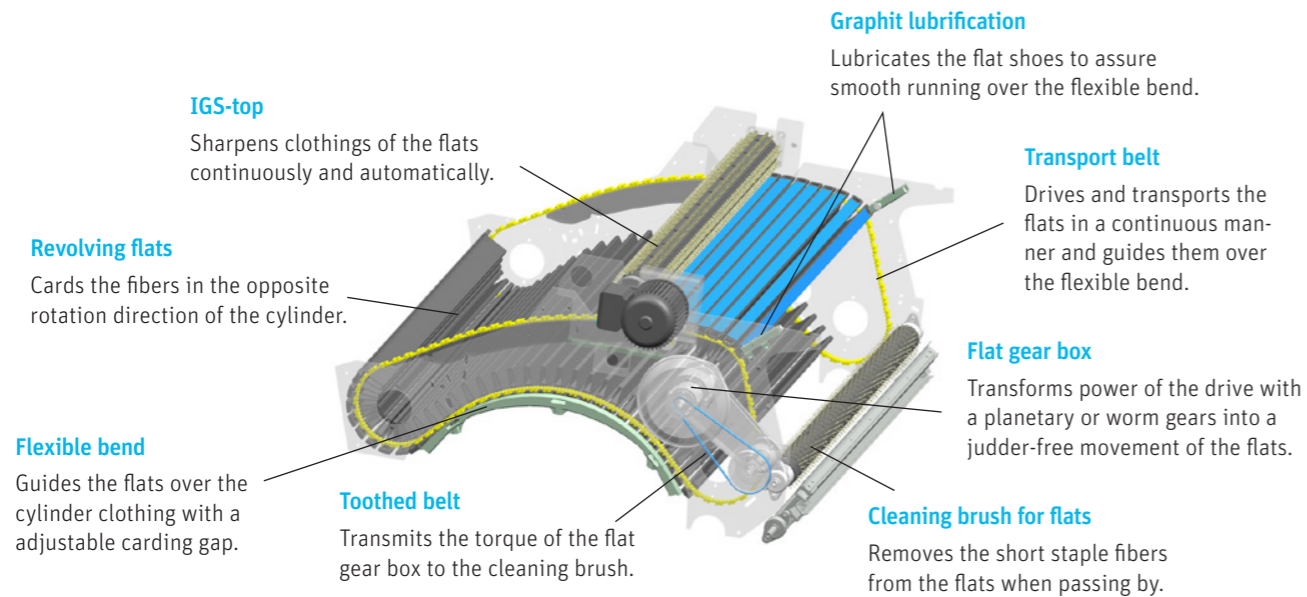
Resistant-free revolving, sharp flats

Above the main cylinder, there is the revolving flat unit which is responsible for opening the tufts and disentangling the neps. It consists of flats, toothed belt, lubrication system and the drive.

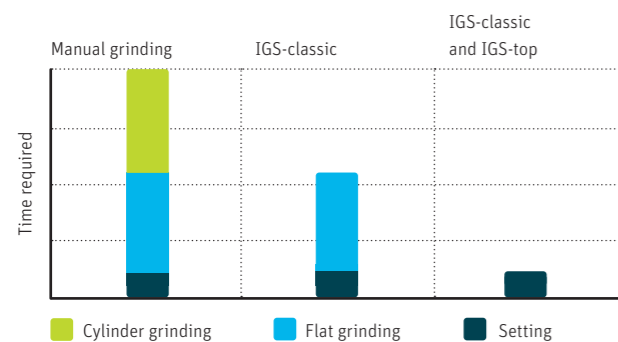
With the IGS-top enhancement, the manual sharpening procedure is replaced by an integrated and fully automated sharpening system resulting in constant sharp flats.

IGS-classic and IGS-top offer multiple benefits

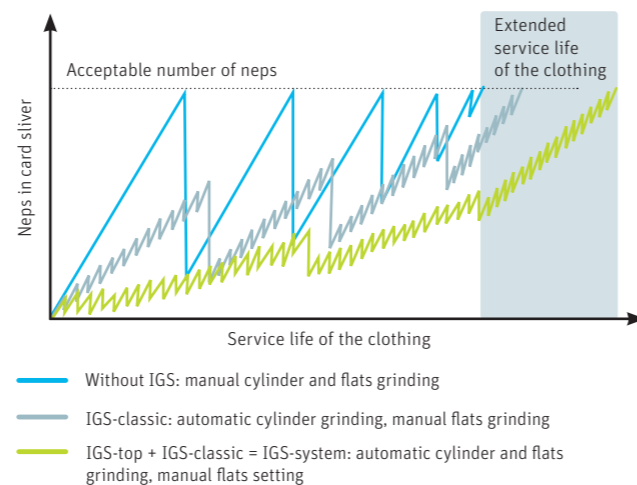
- Lifetime of clothing extended up to 20%
- Consistent sliver quality due to maintain clothing sharpness
- Grinding time reduced up to 80%



Reduced grinding time by automatic grinding (IGS) compared to manual grinding



Extended lifetime of clothing by up to 20% with IGS



Enhancement Kit for Continuous and Simplified Maintenance

Updated lubrication for smooth and easy revolving of flats

The graphite lubrication of the C 70 has been adapted for the C 60 and C 601, which previously had no lubrication system. It ensures clean operation, smooth and easy revolving of the flats. With each revolution, the flat shoes pass through the lubrication system and are coated with a fine, uniform layer of graphite. The shoes run on the guide surfaces of the flexible bend, used to adjust the carding gap between the cylinder and the flats. Thereby the lubrication provides the necessary flexibility to the flats movement. Thus, the service life of the bend and shoes is prolonged, as frictional wear is reduced.

Benefits

- Liquid-free and clean lubrication
- Frictionless flat movement
- Less wear on the flexible bends

Web bridge for simplified maintenance

After the carding process of the main cylinder and the flats, the fibers are carried from the main cylinder to the doffer. On the doffer, the fibers appear as a web. This web is removed by the take-off roller, guided by a web bridge and compressed by the disc rollers. It is condensed in the delivery funnel and formed to a sliver which finally leaves the delivery unit.

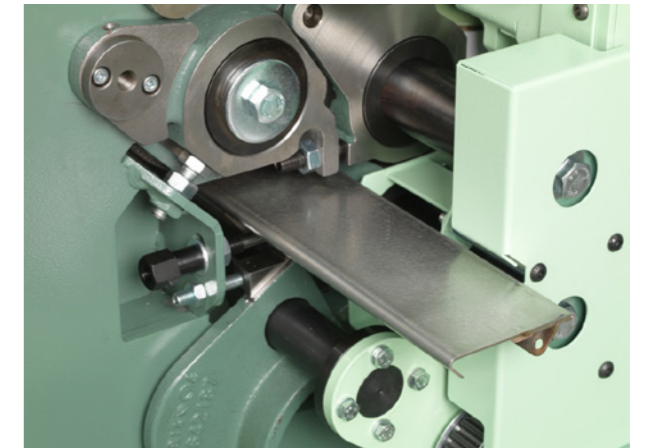
Modernizations of the doffer unit can enhance the high production output of the card. It is recommended to upgrade the delivery unit with the new designed web bridge to assure optimal conditions for the sliver.

Benefits

- Cleaning maintenance time reduced up to 90%
- Better yarn quality by avoiding thick places
- Productivity increase thanks to shorter planned machine downtime



Liquid-free graphite lubrication

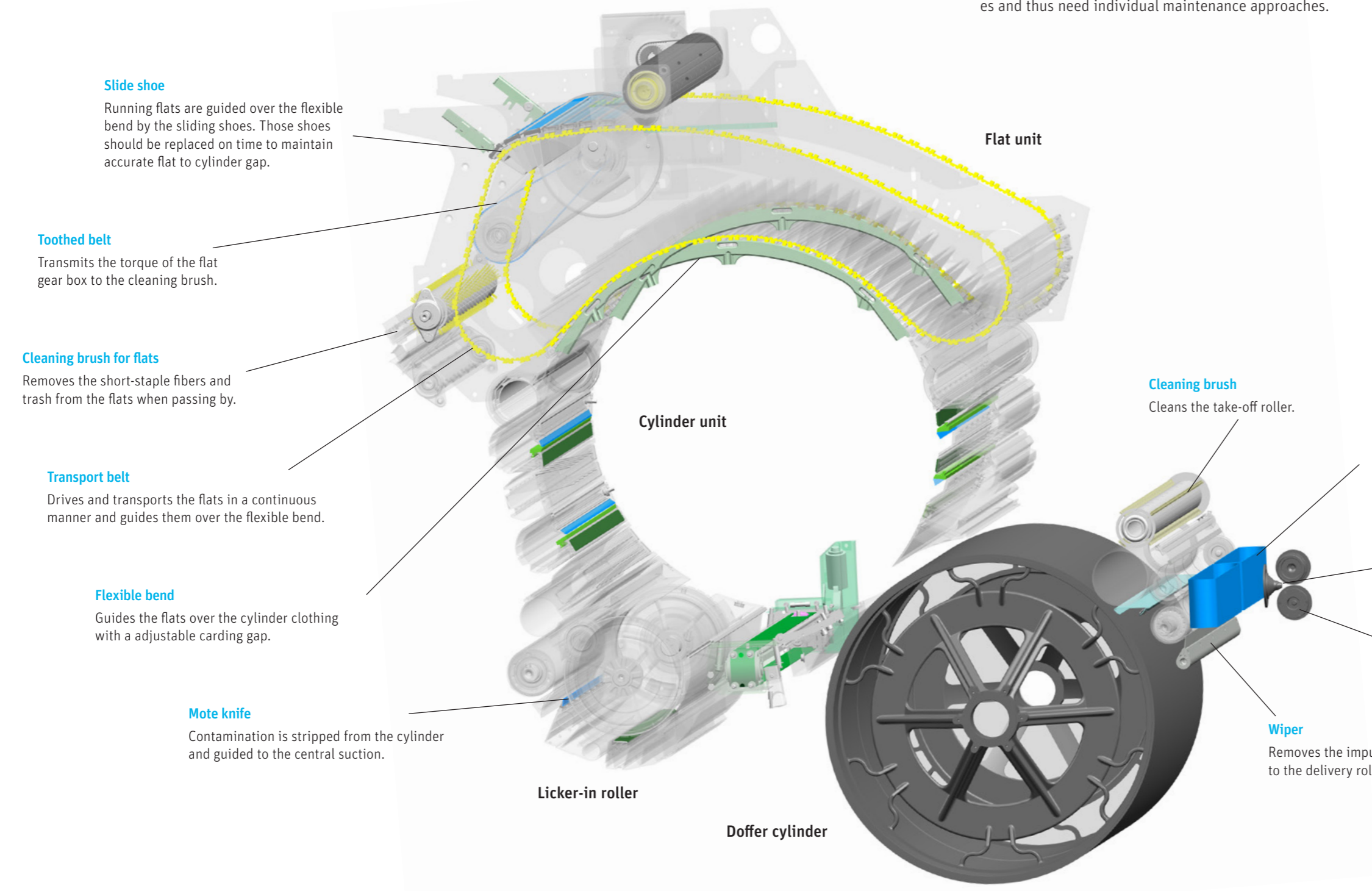


Easy to remove web bridge

High Quality Parts Ensuring Sustainable Performance

Continuous operation and simplified maintenance

Installing high technology parts throughout the card at the right time can improve the overall mill performance and reliability by reducing the downtime to a minimum. Over the years, Rieter service specialists have analyzed and identified technology parts with a high impact on quality and production. Exchanging those parts on a regular basis, helps maintain the high performance of the card.



Slide shoe
Running flats are guided over the flexible bend by the sliding shoes. Those shoes should be replaced on time to maintain accurate flat to cylinder gap.

Toothed belt
Transmits the torque of the flat gear box to the cleaning brush.

Cleaning brush for flats
Removes the short-staple fibers and trash from the flats when passing by.

Transport belt
Drives and transports the flats in a continuous manner and guides them over the flexible bend.

Flexible bend
Guides the flats over the cylinder clothing with an adjustable carding gap.

Mote knife
Contamination is stripped from the cylinder and guided to the central suction.

Licker-in roller

Cylinder unit

Flat unit

Doffer cylinder

Cleaning brush
Cleans the take-off roller.

Cross Apron
Collects the fleece from the delivery roller and guides it to the delivery funnel.

Delivery funnel
Converges the fleece to form the sliver.

Disc / Step Rollers
Compresses the sliver to further compress the sliver.

Wiper
Removes the impurities sticking to the delivery roller.

Well-planned and systematic maintenance

Card clothing consists of metallic wires, flat clothing and stationary flats. They are subject to different stresses and thus need individual maintenance approaches.

- The licker-in roller and the stationary flats have the highest stress due to the maximum trash removal rate. Since it cannot be maintained during production, it has to be changed once it is worn out.
- In the carding zone, consisting of the cylinder clothing and the flats, fibers are aligned in parallel and the neps are removed. Due to the possibility to grind them during operation, provided by the IGS-classic and IGS-top, the maintenance intervals can be extended.
- After carding, the cylinder transfers the loose and parallelized fibers to the doffer cylinder. On the doffer cylinder, the fibers appear as a web. Since there is no possibility to maintain the doffer clothing during the production, it has to be changed once it is worn out.

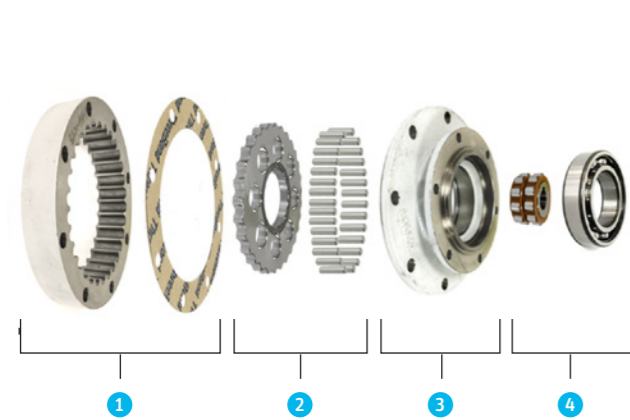
Increased Lifetime of Parts through Preventive Servicing

State of the art service by Rieter professionals

Gear box service for C 60 and C 70

Longer service for the chute drive

The chute feed roller is driven by a geared motor and feeds the card with the opened batt. The feed roller operates intermittently. Based on the material demand of the card, a uniform batt weight is achieved. The high torque is generated by the start/stop function and leads to a higher load. The periodic servicing of the geared motor helps boost performance while extending lifetime.



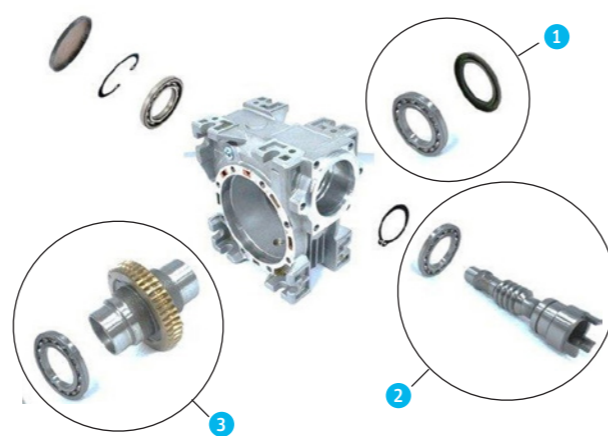
Repair and service of chute drive involves:

1. Lifetime check of ring gear housing
2. Replacement of internals like cycloidal disc and roller shaft
3. Bearing replacement and alignment in housing
4. Eccentric cam replacement

Flat gear box for C 60 and C 70

Freely running flats

The flat gearbox ensures a controlled, judder free movement of the revolving flats. The revolving flats are driven either by a planetary or worm gear, which can be refurbished over a running period to ensure easy operation.



Repair and service of flat drive involves:

1. Oil seal and bearing replacement
2. Replacement of worm shaft and setting adjustment
3. Worm wheel and bearing replacement

Solution oriented service for electronic parts

Rieter offers various preventive and repair solutions with localized service facilities. The electronic components are exposed to high temperature, humidity, long operation hours and ageing. With periodic conditioning of the critical components, the lifetime of electronics and optimum performance of the card is ensured. Solutions provided by the service facilities cover the entire range and repairs are executed by well-equipped Rieter experts using genuine Rieter parts and customized software for individual product requirements. Each electronic device received for service is carefully checked and tested under simulated conditions. Preventive repair is offered for the following electronic units and modules.

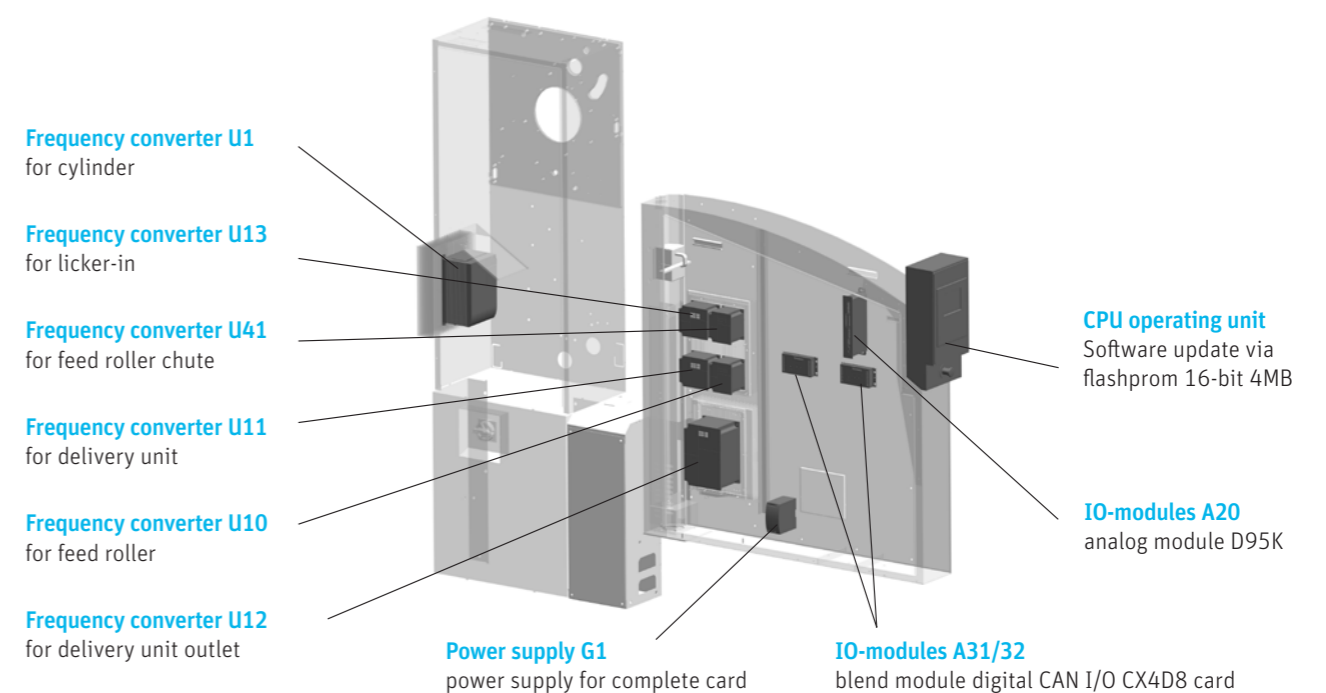
Frequency converter

Continuous production through upgraded converter

Frequency converters are subject to aging, which leads to a decrease in performance. Maintenance can be accomplished by using the offered frequency converter kit or according to the operating instructions. Rieter recommends replacing the previous generation of frequency converters with the latest update to take advantage of newly developed controls and to further upgrade to the latest card software. Replacing the inverters keeps the system up-to-date and further ensures and improves the production of the machine.

Benefits of preventive repair

- Higher reliability in production
- Enhanced lifetime of components
- Unexpected breakdown and production loss avoided
- Planned maintenance and reduced maintenance cost



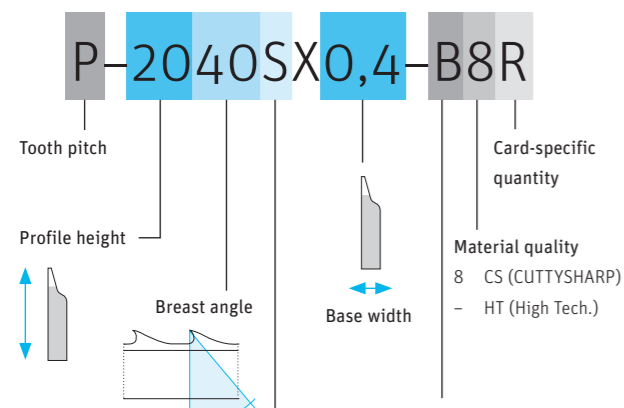
Reclothing and Rewiring of the Card Clothing

Excellent carding performance with advanced wire technology

Rieter offers a comprehensive package from product and technical advice to service and service equipment. The card clothing is selected according to the machine type and its application. The machine is characterized by the type and the production speed, which is set depending on the quality, output and trash discharge quantity. The application includes the material, the end-spinning process and the yarn count to be achieved in the yarn. This then results in a combination of wires and clothings that are in line with each other within and between the processing zones. Once the card clothings are refurbished on the machine, it is important to set the distances correctly and according to the machine setting sheet.

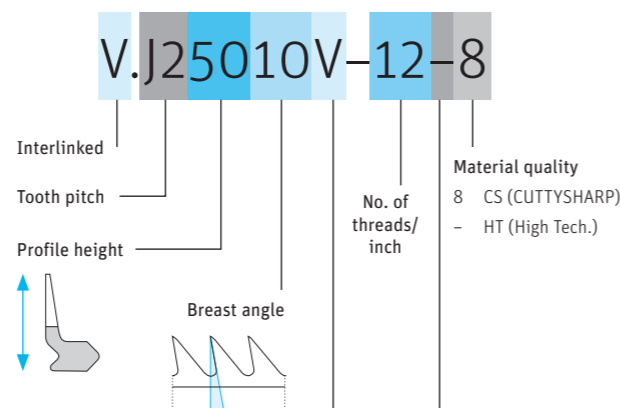
With a specification sheet, Rieter offers the right solution for every application. The figures in the tables on the right side show two different sets of applications of card clothing: 100% cotton (ring carded/combed) and universal (Swing 100% MMF/Co).

Standard profiles



- Special treatment**
Examples:
B Blank hardened
C Serrated profile + blank hardened
- Special profile**
- | | | |
|-----|----------------------|--|
| B | Arched tooth shape | |
| C | Camel (hump shape) | |
| F | Flat tooth | |
| G | Beak-shaped tooth | |
| M | Morel | |
| S | Special cut depth | |
| V | Licker-in profile | |
| W | Execution with humps | |
| - | Standard tooth shape | |
| 1-9 | Special tooth shape | |
- | | | |
|---|----------------------------------|--|
| N | Needle Finish | |
| P | Polidur | |
| Q | Serrated profile + Polidur | |
| R | Serrated profile | |
| S | Smooth Finish | |
| V | Serrated profile + Needle Finish | |
| W | Serrated profile + Smooth Finish | |

Interlinked profiles



- Special treatment**
Examples:
B Blank hardened
N Needle Finish
P Polidur
Q Serrated profile + Polidur
R Serrated profile
S Smooth Finish
V Serrated profile + Needle Finish
W Serrated profile + Smooth Finish
- Special profile**
- | | | |
|-----|----------------------|--|
| B | Arched tooth shape | |
| C | Camel (hump shape) | |
| F | Flat tooth | |
| G | Beak-shaped tooth | |
| M | Morel | |
| S | Special cut depth | |
| V | Licker-in profile | |
| W | Execution with humps | |
| - | Standard tooth shape | |
| 1-9 | Special tooth shape | |
- | | | |
|---|----------------------------------|--|
| B | Blank hardened | |
| N | Needle Finish | |
| P | Polidur | |
| Q | Serrated profile + Polidur | |
| R | Serrated profile | |
| S | Smooth Finish | |
| V | Serrated profile + Needle Finish | |
| W | Serrated profile + Smooth Finish | |

Nomenclature for the wire code

Licker-in wire						
Application		Wire code	No. of threads/inch	ppi	Working angle	Height
100% cotton	Ring carded/combed	VJ25010V-12-8	12	118	10°	5
Universal	Swing 100% MMF/Co	VJ25005V-12-8	12	118	5°	5

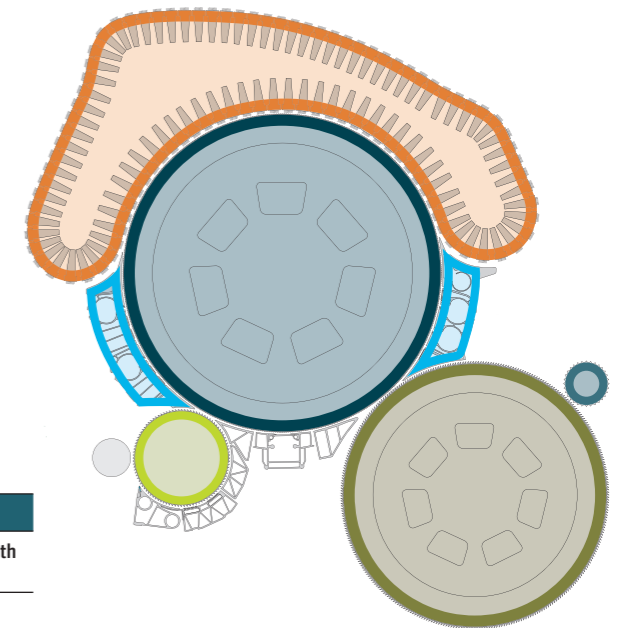
Stationaries				
Application		Wire code	ppi	
100% cotton	Ring carded/combed	Licker-In	FD9A	90
		Pre-carding-zone	FD9A	90
			FD24C	240
			FD9A/FD24C	90/240
Universal	Swing 100% MMF/Co	Postcarding-zone	FD42B	420
			FD64A	640
Universal	Swing 100% MMF/Co	Licker-In	FD9A	90
		Pre-carding-zone	FD9A	90
			FD24C	240
			FD9A/FD24C	90/240
			FD42B	420
			FD64A	640

Cylinder wire					
Application	Wire code	ppi	Working angle	Height	Base with
100% cotton	Ring carded/combed	P-2040SX0,4-B8	966	40°	2 0.4 mm
Universal	Swing 100% MMF/Co	P-2025-X0,5-B8	773	25°	2 0.5 mm

Flat clothing			
Application	Wire code	ppi	Yarn count
Cotton and blends	Ring/OE/Rotor/Airjet, carded/combed	RSTO C-55/0	550 > Ne 24
Man-made fibers/blends	Polyester/Viscose/Swing/Blend cotton/MMF/Regenerates/Bleached cotton	RSTO M-48/0	480 1.0 - 2.0 dtex

Doffer wire					
Application	Wire code	ppi	Working angle	Height	Base with
100% cotton	Ring carded/combed	M-46301X11,0-C	304	30°	4.6 1.0 mm
Universal	Swing 100% MMF/Co	M-46351X11,0-C	304	35°	4.6 1.0 mm

Card take of roller wire					
Application	Wire code	ppi	Working angle	Height	Base with
Universal	Ring carded/combed Swing 100% MMF/Co	H-35-30X1,0	206	-30°	3.5 1.0 mm

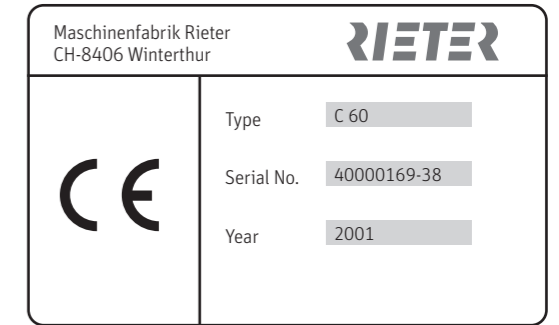


Compatibility Overview

Specific upgrades for the card

Rieter offers a comprehensive after sales portfolio, spanning the replacement or repair of single parts to the overhaul of a single machine to a complete spinning mill optimization. Before a major upgrade, Rieter recommends an inspection of the machine by a Rieter service technician. This not only helps ensure the compatibility of the upgrade and its correct installation, but also determine in which condition the machine is in and which parts should be replaced. The full benefit of an upgrade is obtained only if the machine is in good technical condition.

The serial number of the machine (e.g. 40000169-38) provides specific information of the card version and is located on the machine name plate. The year on the plate (e.g. 2001) corresponds with the year of manufacturing. Individual technology parts which are not part of the upgrades in the lists below and on the left side, can be ordered in ESSENTIALorder or via Rieter sales and agents. Order information is provided in the parts catalogue which is supplied with the machine delivery.



Compatibility overview for repairs

	Order no.	Upgrade	Feature	C 60 and C 601					C 70											
				V0	V2	V4	V6	V8	V0	V2	V3	V5								
				V1	V3	V5	V7	V9	V1	V2.1	V4	V5								
Mechanical repair service	10566047	Chute feed geared motor Model No: CNHMS-6105DAG-377	Longer service for the overhauled chute drive	X	X	X	X													
	10723351	Flat drive geared motor Model No: DE Varv50/70-150W-IGS/ Valve	Freely running flats with revised gear box							X	X	X								
	10431491	Flat drive planetary gear box Model No: P75 / P108 i600:1		X	X	X	X	X												
	10725775	Chute feed geared motor Model No: CNHMS-6090DAG/G/71/4	Longer service for the overhauled chute drive						X	X	X	X								
	10903936	Flat drive geared motor Model No: TDW06-DVK i=1870	Freely running flats with refurbished gear box												X	X				
Electrical repair service	10165683	Operating unit CPU PP41 (A10)	Increased lifetime through electrical repair service. Operating unit for control of the machine, blend module for machine signals, power supply for card, frequency converters to drive the different motors.				X	X												
	10524238	Operating unit PP 450 (A10)							X	X	X									
	10043381	Blend module CX408 (A31 to A34)					X	X	X	X	X	X								
	10315964	Power supply 24V 20A (G1)							X	X	X	X								
	Machine specific	Frequency converters					X	X	X	X	X	X								

Card variants and its serial numbers

C 60 V0	40000169	C 60 V5	40003470	C 601 V6 = C 60 V6	40008390
C 60 V1	40001020	C 60 V6	40004141	C 601 V8 = C 60 V8	40012230
C 60 V2	40001130	C 60 V7	40009361	C 601 V9 = C 60 V9	40015540
C 60 V3	40002470	C 60 V8	40009910	C 601 V9.1 = C 60 V9.1	40017202
C 60 V4	40003160	C 60 V9	40012900	C 601 V9.1 = C 60 V9.1	40018272
				C 61 V1/2 = C 60 V1/2	40001025

Compatibility overview for parts and kits

	Order no.	Upgrade	Feature	C 60 and C 601					C 70											
				V0	V2	V4	V6	V8	V0	V2	V3	V5								
				V1	V3	V5	V7	V9	V1	V2.1	V4	V5								
Parts & kits	Chute	40021511	Card chute pressure control				X	X		X	X									
		23051648	Graphit lubrication C 60	Continuous liquid-free lubrication				X	X	X										
	Flat unit	40027045	Q-package card	Quality improvements with added profiles	X	X	X	X	X											
		23053331	Upgrade IGS-classic	Consistent sharp carding edge	X	X	X	X	X			X	X	X						
	Cylinder unit	C-Offer	IGS-top	Automated flat sharpening	X	X	X	X	X			X	X	X	X					
		C-Offer	Separate lick-in waste disposal	Sustainable recycling of flat waste	X	X	X	X	X			X	X	X	X					
		40023101	Web bridge	Reduced thick places in sliver						X	X	X								
	Cost-saving modules	40027255	Frequency converter retrofit C 60 V6-V8	New state of the art converters				X	X											
								X												
	Delivery unit									X	X									
									X											
Electronic repairs																				

Card variants and its serial numbers

C 70 V0	40014470	C 70 V2.1	40017140	C 70 V3	40020704	C 70 V4	40023405	C 70 V5	40024800
C 70 V1	40015800	C 70 V2.1	40017141	C 70 V3	40020713	C 70 V4	40023433	C 70 V5	40024801
C 70 V2	40016691	C 70 V2.1	40018270	C 70 V3	40021062	C 70 V4	40023771	C 70 V5	40024833
C 70 V2	40016719	C 70 V2.1	40018271	C 70 V3	40021063	C 70 V4	40023777	C 70 V5	40024850
		C 70 V2.1	40021811	C 70 V3	40021781	C 70 V4	40023802		
				C 70 V3	40023146	C 70 V4	40023808		



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