Card C 60

The concept for excellence
"C 60 – Tradition meets Innovation"
Rieter – Tradition since 1795
Rieter has been a leader in the textile industry for more than 200 years. Complete ring and rotor spinning systems are delivered to customers worldwide for the production of high quality yarns for all kinds of applications. This experience in fiber processing from bale to yarn combined with innovation are the prerequisites for the development of high production textile machinery.

We are proud to offer our customers complete solutions in all leading yarn manufacturing technologies and to share our know-how in:

- Management i.e. cost calculation, mill and integrated automation planning
- Textile technology i.e. process and yarn application
- Support i.e. training, field service and maintenance
- Production i.e. machine efficiency and operation

Rieter – Competence in carding
Since 1981 more than 15,000 cards of the C-Series have been produced and delivered to customers around the globe. Rieter’s goal to steadily increase productivity without compromising the quality has always been the main challenge of the development efforts.

In order to fulfill this demanding goal, Rieter introduced the integrated grinding system IGS for cards. The IGS system guarantees consistent carding quality throughout the lifetime of the cylinder wire and flats pins.

Rieter Card design from 1898
“C 60 – The new dimension in carding”

C 60: 6.94 m²

Reference card: 7.65 m²
C 60 – From tradition to innovation
Tradition leads to experience and experience combined with research leads to knowledge.
Real innovation is the application of this sound knowledge to meet the requirements in our competitive world. The C 60 card is meant to meet today’s as well as future demands.

New geometry for productivity and quality
Production increase with top sliver quality is a constant challenge. The answer to this is the C 60 card with its revolutionary concept.
The C 60 has an entirely redesigned geometry. The main differences are:
• Increased working width from 1000 mm to 1500 mm for a 50% larger carding area
• Reduced cylinder diameter
These two measures allow an increased production without compromising the sliver and end product quality.
The reduced cylinder diameter results in a higher cylinder speed and a higher carding precision.
Due to the increased centrifugal forces, the trash reduction capability is significantly improved. This is of extreme importance in the case of rotor spinning applications.
The increased carding area combined with higher precision leads to a better overall carding result.

Modularity for easy maintenance and flexibility
The modular concept consists of:
• The licker-in
• The flat
• The doffer module
These modules reduce the maintenance load, the pressure on employee requirements and the machine downtime. The easy exchange of modules makes the card adaptable to whatever the end product demands.

Constant high quality
The IGS system for the wire maintenance ensures a consistent high sliver quality, increases the lifetime of the wire set and reduces the maintenance downtime to an unmatched level.

C 60 – Productivity for all applications
The new concept provides the ability to increase the production rates for all applications.
Due to the ingeniously compact construction, the C 60 requires the same amount of floor space, or less, than that of a conventional card.

New Concept:
• Increased working width
• Increased carding angle
• Smaller cylinder diameter
• Modular concept
• Integrated Grinding System (IGS)

Benefits:
• Highest productivity
• High and constant sliver quality
• Increased trash reduction
• Meets today’s and tomorrow’s requirements
“Perfect feeding with active compression”
**Optimal material preparation**
The integrated chute feed of the C 60 has been designed for perfect material preparation, which means small fiber tufts in an even mat.

**Gentle but effective material opening**
The integrated fine opener in the chute with feed trough and adjustable roll speed provides gentle but effective fiber opening. This shifting of opening from the cleaning machines to the card gives some definite advantages:
- Lower nep increase due to the fiber transport
- Gentle opening due to low production rates

These well-opened tufts are fundamental for an effective carding, for nep and trash reduction and for an increased lifetime of the card clothing.

**Active compression**
An integrated fan provides active compression of the fiber material, which is the basis for an even and uniform mat structure. This again is essential for:
- A permanent high sliver quality
- Low count variations
- Low CV values
- A high production efficiency

**Economy**
The fine mat structure reduces the operating costs for 2 reasons. The lifetime of the card clothing is increased by up to 50% and reduces machine downtime. This benefits maintenance cost and productivity.

**Benefits:**
- Less neps due to gentle fiber opening in chute system
- Longer lifetime of licker-in wire
- Less machine downtime
- Best CV% values as a result of uniform material feeding

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**Integrated chute**

The new card feeding system

![Active compression for an even mat](image)
“High trash extraction and gentle fiber treatment for best quality”
**1- or 3-roll licker-in module**

**Optimum for every application**

**Most favorable condition for every application**
Depending upon the end product – a synthetic yarn, a very fine cotton yarn, a rotor yarn or a yarn from regenerated fibers – the process requirements are different. At the same time, the feasible card production rate may vary from 45 to 220 kg/h.

One process may require gentle fiber opening and nep reduction as top priority, while another process may place more importance on high productivity and trash extraction. The C 60 permits optimal configuration, no matter what the mill requirements are.

**High raw material yield**
In carded and combed ring yarn applications, as well as for regenerated fibers, it is important to make full use of the supplied fiber properties. Extensive research with the 1-roll licker-in design confirms a gentle fiber opening and reduced fiber extraction, which is most economical. This assures that fiber characteristics like length and strength are preserved and therefore contribute to a high yarn quality.

**High productivity for rotor yarn application**
As the tendency towards higher rotor speeds continues, the use of smaller rotor diameters becomes necessary. Minimizing the amount of trash particles in the sliver is of vital importance for the successful use of small rotors.

In this case a 3-roll licker-in module, which has been developed for maximum trash removal while maintaining the most gentle fiber treatment possible, is the appropriate solution. Carding segments and mote knives at all rollers efficiently extract trash particles. As a result, production rates up to 220 kg per hour are achieved for rotor yarn applications.

**Flexible system**
The type of licker-in module can be changed easily within minutes. Maintenance downtime is reduced and work is greatly simplified through the exchange of complete licker-in modules at the cards.

**Benefits:**
- Reduction of downtime due to shortest maintenance requirements
- Unsurpassed flexibility
- Perfect web preparation
- Perfect trash extraction

### Typical applications

<table>
<thead>
<tr>
<th></th>
<th>Production &lt; 120 kg/h</th>
<th>Production &gt; 120 kg/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-roll licker-in</td>
<td>Fine Ring yarn</td>
<td>Coarse Ring yarn and yarn from regenerated fibers</td>
</tr>
<tr>
<td>3-roll licker-in</td>
<td>Certain fiber material</td>
<td>OE yarn</td>
</tr>
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</table>

3-roll licker-in module
“Integrated Grinding for constant quality”
The carding zone

Efficient nep and trash removal

Pre- and post-carding area
Carding units separate trash, dust and short fibers in the pre- and post-carding zones. Guiding elements and the associated mote knives are responsible for the extraction of the impurities. Different sets of carding elements are available to meet the requirements for a specific yarn type.

Main carding area
After the pre-carding zone, the fibers enter the active carding area. Mill trials showed that the higher centrifugal forces support the separation and extraction of trash, short fibers and seed-coat fragments.

Integrated Grinding System (IGS)
The inevitable wear of the card clothing becomes an even more crucial issue with any high production card. The Integrated Grinding System (IGS) – a unique Rieter feature – solves this fact fundamentally by keeping the wires sharp at all times.

The advantages are:
- Constant sliver quality over the lifetime of the wires
- Better carding i.e. trash and neps reduction due to constant sharp wires
- No downtime for the grinding of cylinder and flat clothing since it is a fully automated and computer controlled system
- Strongly reduced maintenance load
- Prolonged lifetime for cylinder wires and therefore very economical
- Ideally suited for the latest wire technologies which are difficult to grind manually

Benefits:
- Effective removal of impurities
- Efficient nep removal
- Quick exchange of flat module for minimal machine downtime
- IGS system for constant high sliver quality

The flat module
The uniquely designed flat module, consisting of 79 precise flats, guarantees a high degree of nep and impurity removal. The modular concept allows a complete exchange of the flat module in a very short time. It is also possible to change single flats on the machine if necessary.

The carding zone

Sharp wires and flats at all times
“Easy operation”
From web to sliver

Perfect fiber control

Sliver formation
The newly designed doffer securely gathers the web from the cylinder.

The subsequent sliver formation is made by two cross aprons, which gather up the web and delivers the sliver close to the nipping point of the take-off rolls.

Easy handling
In case of a sliver break, the operator simply activates a lever and inserts the new sliver into the can coiler or into the drawframe module.

Card levelling system

For unsurpassed sliver quality

Medium term levelling
The feeding trough measures the mat thickness of the chute feed. According to the determined values, the feed roller speed of the card is automatically adapted to maintain a uniform sliver count.

Long term levelling
The sliver count is measured by a disc roller pair. The measured signals are processed and used for the control of the chute system.
“Vast experience in carding and drawing”
The drawframe module for C 60

Based on existing know-how
The C 60 drawframe module has a solid foundation and is based on:
• 20 years of Rieter’s unsurpassed expertise with autolevelling systems
• 20,000 high performance drawframes units sold

Process integration
The integration of a drawframe does not only improve economy but also productivity. Even yarn quality is improved in the case of a direct OE process in certain applications. The drawframe module is available in two versions: The C 60 SB without autoleveller system and the C 60 RSB with the well-proven Rieter autoleveller system. Depending on yarn count, raw material and spinning technology, it is possible to reduce the number of conventional drawframe passages from two to one (C 60 SB) or from one to zero (Direct process with C 60 RSB).

Technology
The C 60 RSB is equipped with a digital short-term levelling system. The mass of the C 60 card sliver is scanned with the well-proven principle of tongue-and-groove rollers. The pneumatic loading of the rollers guarantees constant scanning. Based on the measured values, the levelling processor calculates a nominal value for the high-dynamic servo drive. It is transferred at the exact instant when the measured piece of card sliver arrives at the levelling point within the main drafting zone.

Maximum levelling
The Rieter autoleveller system ensures top sliver quality for the downstream processes. The decisive difference is achieved by levelling 100% of the sliver whether in the running or doffing mode.

Benefits:
• Shorter and quicker production process
• 100% levelled sliver with the C 60 RSB
• Increased productivity with reduced space requirements
• Fewer cans necessary
• Less labor
• No mixing up of cans

RSB autolevelling principle
1 Scanning roller
2 Digital signal processor
3 Servo drive
4 Drafting system
5 Main drive (inverter controlled)
6 Rieter Quality Monitor
Modular construction

Minimum machine downtime

C 60 – Revolutionary design
In addition to creating a modern and attractive appearance for the C 60, extensive ergonomic design ideas have been integrated to ensure maximum user friendliness and minimum machine downtime.

IGS-system
Today the main reason for machine downtime in carding is the necessary sharpening of the card wires. Production losses due to grinding have been eliminated with the introduction of the IGS system.
The IGS system improves the sliver quality and even prolongs the lifetime of the cylinder wire and the flats pins.

Easy exchange of modules
The exchange of the licker-in and the flats as well as the rewiring of the doffer are time-consuming maintenance duties with conventional cards.
The modular construction of the C 60 reduces these downtimes to never before achieved minimums. All three modules can easily be exchanged with optional spare modules. Only one maintenance worker is necessary for each of these duties. For example, the exchange of the licker-in module can be completed in less than 90 minutes.

Benefits
- User-friendly concept
- Minimum machine downtime
- Reduced maintenance load
- Constant high sliver quality

With the IGS system and the modular machine concept, Rieter has achieved a major step towards eliminating machine downtime while improving the consistency of sliver quality.
“Highest production rates with the best quality”
Economy

C 60 – The card for success

Economical production
The C 60 card sets new standards in productivity and quality. Economy completes this strength to a harmonic entirety. A whole set of measures assures these important features.

More production with less floor space
The dimensions of a spinning mill are defined by various factors. Depending on the yarn count, either the quantity of end spinning machines or the preparatory equipment defines the width of the spinning mill.

The high production potential of the C 60 permits a more economical building layout. (Example at right: Ne 7, 100% CO, raw material input = 1070 kg/hour, yarn production = 1000 kg/hour)

The direct OE process with the integrated drawframe results in the most efficient yarn production system. Capital and production cost are reduced to the maximum possible.

Minimized machine downtime
The machine concept with the licker-in, flat and doffer module makes maintenance easy and reduces the machine downtime. The IGS system again reduces downtime and maintenance cost to a never experienced minimum.

Excellence based on facts
Economy is based on figures and facts. Investment, personnel, energy and maintenance costs as well as productivity need to be considered to achieve a high degree of economic excellence. Challenge our expertise on your specific project and ask for figures and facts, i.e. production costs per kg yarn. The personnel requirements calculated for the mill example below are 0.514 hours per operator for 100 kilograms of yarn (HOK), which is an extremely low value.

Benefits
- More production per square meter
- Process integration with SB or RSB module possible
- Less cans required
- Less labor required
- Lower energy consumption
- Simpler maintenance
- Ease of operation

Machine layout for a yarn Ne 7 production of 1000 kg/hour
C60 with CBA-4 can coiler (cans with castors)

<table>
<thead>
<tr>
<th>CBA-4</th>
<th>Measurements [mm]</th>
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<tbody>
<tr>
<td>600</td>
<td>1125 1400</td>
</tr>
<tr>
<td>750/800</td>
<td>1325  1800</td>
</tr>
<tr>
<td>1000</td>
<td>1525  2200</td>
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</table>
Card C 60

Data

<table>
<thead>
<tr>
<th>Technological data</th>
<th>Card C 60</th>
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</thead>
<tbody>
<tr>
<td>Material</td>
<td>Cotton, manmades and blends up to 65 mm (2.5&quot;)</td>
</tr>
<tr>
<td>Production</td>
<td>up to 220 kg/h</td>
</tr>
<tr>
<td>Sliver count</td>
<td>4–20 ktx (C 60)</td>
</tr>
<tr>
<td></td>
<td>3–7 ktx (C 60 SB/C 60 RSB)</td>
</tr>
<tr>
<td>Sliver draft (C 60 SB/C 60 RSB)</td>
<td>up to 5</td>
</tr>
<tr>
<td>Mat weight</td>
<td>650–950 g/m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technical data</th>
<th>Chute</th>
<th>C 60</th>
<th>C 60 SB</th>
<th>C 60 RSB</th>
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</thead>
<tbody>
<tr>
<td>Total Installed power incl. chute [kVA]</td>
<td>&lt;120 kg/hour</td>
<td>&lt;220 kg/hour</td>
<td>&lt;220 kg/hour</td>
<td>&lt;220 kg/hour</td>
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<tr>
<td>Delivery speed [m/min]</td>
<td>330</td>
<td>800</td>
<td>700</td>
<td></td>
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<tr>
<td>Compressed air [Nm³/h] min. 6 bar</td>
<td>0.75</td>
<td>0.78</td>
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<tr>
<td>Exhaust air [m³/h]</td>
<td>828</td>
<td>4680</td>
<td>5220</td>
<td>5220</td>
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</table>

- Waste removal: central suction
- Cylinder speed: up to 900 rpm

<table>
<thead>
<tr>
<th>Machine data</th>
<th>Card C 60</th>
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<tbody>
<tr>
<td>Working width</td>
<td>1500 mm</td>
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<tr>
<td>Can sizes</td>
<td>420–1000 mm (17&quot;–40&quot;)</td>
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<tr>
<td>Machine length (with chute)</td>
<td>3325 mm</td>
</tr>
<tr>
<td>Machine width (without coiler)</td>
<td>2380 mm</td>
</tr>
<tr>
<td>Weight (machine with coiler)</td>
<td>6200 kg</td>
</tr>
<tr>
<td>Heights</td>
<td></td>
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<tr>
<td>– Card</td>
<td>1845 mm</td>
</tr>
<tr>
<td>– Chute</td>
<td>3470 mm</td>
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### C 60 SB (empty can magazine, cans with castors)

<table>
<thead>
<tr>
<th>C 60 SB</th>
<th>Can height</th>
<th>Number of empty cans</th>
<th>Measurements A</th>
<th>Measurements B</th>
<th>C</th>
<th>D</th>
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</thead>
<tbody>
<tr>
<td>750/800</td>
<td>&lt;1320</td>
<td>4</td>
<td>1277</td>
<td>6300</td>
<td>873</td>
<td>1440</td>
</tr>
<tr>
<td>750/800</td>
<td>&gt;1320</td>
<td>4</td>
<td>1520</td>
<td>6300</td>
<td>873</td>
<td>1440</td>
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<tr>
<td>900</td>
<td>&lt;1320</td>
<td>1 2 3</td>
<td>1277</td>
<td>3800 5230 6300</td>
<td>973</td>
<td>1535</td>
</tr>
<tr>
<td>900</td>
<td>&gt;1320</td>
<td>1 2 3</td>
<td>1520</td>
<td>3800 5230 6300</td>
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</tr>
<tr>
<td>1000</td>
<td>&gt;1320</td>
<td>1 2 3</td>
<td>1520</td>
<td>3800 5230 6300</td>
<td>1100</td>
<td>1600</td>
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C 60 RSB

Empty can magazine, cans with castors

<table>
<thead>
<tr>
<th>C 60 RSB</th>
<th>Number of empty cans</th>
<th>Measurements</th>
<th>A</th>
<th>B</th>
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<tbody>
<tr>
<td>420</td>
<td>5</td>
<td>4790</td>
<td>1780</td>
<td>800</td>
<td></td>
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<td>450</td>
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<td>470</td>
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<td>600</td>
<td>4</td>
<td>5430</td>
<td>1950</td>
<td>970</td>
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</tr>
</tbody>
</table>

Empty can magazine, cans without castors

<table>
<thead>
<tr>
<th>C 60 RSB</th>
<th>Number of empty cans</th>
<th>Measurements</th>
<th>A</th>
<th>B</th>
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<tbody>
<tr>
<td>420</td>
<td>5</td>
<td>3900</td>
<td>1780</td>
<td>800</td>
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<tr>
<td>450</td>
<td>4</td>
<td>3700</td>
<td>1780</td>
<td>800</td>
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<tr>
<td>470</td>
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<td>500</td>
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<td>600</td>
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<td>4350</td>
<td>1950</td>
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