Automated Air-Jet Spinning Machine J 26

Economical yarn production with a flexible machine
Up to 200 spinning units, up to 6 robots and spinning unit automation for piecing – features that substantially increase machine productivity and flexibility.
Economical Yarn Production
Flexible in Application
J 26 with independent sides and extended product range offers the highest flexibility in application.
Customized and Innovative Solutions
Special technology components and the Rieter yarn clearer Q 20AF with foreign fiber detection ensure smooth spinning of 100% cotton combed yarn with perfect soft touch.
OUTSTANDING ADVANTAGES

Independent Machine Sides
Completely independent setting and package handling

Advances in Productivity
Up to 200 spin units with six robots and delivery speeds of 500 m/min. on minimum floor space

Easy Operation
Easy operation where the opening spin nozzle, cans, spin unit and winding unit are visible in one view

Energy-Saving Concepts
Individual drives for the spinning and winding units, traversing for prolonged life-time of components, solutions for air and energy savings
**Optimized Winding Concept**
Heavier weight and homogenous package density with soft edges
Easy setting for dyeing packages

**Economical Production**
Spin unit design suitable for economical production of 100% cotton combed yarns with features providing for the fabric soft touch

**Rieter Yarn Clearer**
Unique opto-digital clearing technology including special air-jet clearing channels and foreign fiber detection

**Piecing Technology**
Yarn-like piecing with automatic piecing preparation, 100% quality check

**Customized Products**
Soft touch fabrics made out of yarns with high strength
Higher Flexibility
Air-jet spinning machine J 26 – 100% cotton combed

100% cotton combed: Combed cotton soft yarns extend the application range of the J 26

The air-jet spinning machine J 26 enters successfully the application of 100% combed cotton knitting yarns. The unique machine concept with the cans under the spin unit enables the pure cotton spinning. The short way of the combed sliver into the spin unit avoids uncontrolled draft in the sliver and results in stable yarn quality. Newly designed suction system and condensers ensure the drafting system to be clean over the production time. This again supports a stable and high yarn quality. The twisting is done with minimal fiber losses. Very good fiber utilization and high production speed make 100% cotton combed spinning a highly economical application. The Rieter Q 20AF yarn clearer with foreign fiber detection checks the yarn quality.

The fibers are twisted gently in S or in Z direction. In finer counts, S and Z twisted yarns are required in knitting. Alternate feeding brings more stability in the fabric (no screw effect) and softer fabric. With the special soft yarn setting for the yarn spinning on the J 26 outstanding soft and stable air-jet fabric is the result, a product already accepted in the markets.

Economical production of soft combed cotton is only possible on J 26 with:
- Short way of sliver from can to spin unit without uncontrolled draft in sliver
- Stable good yarn quality with a clean drafting system and spin unit
- Economical production with the lowest fiber losses in the twisting area and the highest production speeds
- Soft yarn with special setting at the J 26
- Soft fabric using S and Z twisted air-jet spun yarn
Spinning Yarn with Quality and Quantity
Com4®jet yarn novel structure at high productivity

Increased productivity due to:
• machine length of up to 200 spinning units
• up to 6 robots
• production speed of up to 500 m/min
• automatic piecing preparation (APP)

The advances of the J 26 machine concept aim to increase the productivity of the machine but at the same time reduce demands on the robots or operating personnel for operating the machine.

Automatic piecing preparation (APP)

The J 26 machine features the APP system, which automates piecing preparation on the spin unit in event of a quality cut. The unit prepares itself for the piecing process before the robot arrives. For the majority of ends down due to quality stoppages, the piecing cycle is therefore reduced by half. The shorter piecing cycle thus makes piecing more efficient and enables the robots to serve more spinning units.

Com4®jet soft yarn

With the Soft Yarn setting the Com4®jet yarn and the fabric get a soft touch. Lower spinning air pressure, higher delivery speed and adapted technology components result in soft yarns as well as in 10% lower conversion costs. The low hairiness and the good pilling resistance are maintained.
Customized Solution for Air-Jet Yarn Clearing
Rieter yarn clearer Q 10A* and Q 20AF*

With 15 years of experience and more than 1 million of sensors in operation Rieter launched a yarn clearer specially designed for air-jet spinning. In addition to standard clearing channels and spectrograms the yarn clearers Q 10A and the Q 20AF have the following features:

• Special clearing channel detecting very fast yarn surfaces changes caused by spin nozzle blockages. The detection is within 10 m and the fault can be removed easily.

• Unlike any other yarn clearer sensor, Q 10A and Q 20AF provide a direct digital output out of the measurement. This guarantees maximum exactness in detecting yarn fault size, e.g. small but long yarn count deviations.

• The Q 20AF yarn clearer detects foreign fibers as well. Dark and light foreign fibers can be detected according the settings. All other channels of the Q 10A are part of the Q 20AF functionality as well. For standard application the Q 10A is recommended. For applications requiring foreign fiber detection, the option Q 20AF is the choice.

• A specially designed spectrogram helps to set individual limits for warnings and alarms and provides reliable detection and data to analyze the cause of periodic faults.

* Option
Air-Jet Technology

S twist and yarn like piecings at J 26

Rieter air-jet technology can be flexibly adjusted to reach different yarn characteristics for standard and soft touch yarns. Additionally the orientation of twist can be selected in either S or Z direction. The standard Z twist is used for all applications. For finer yarn counts and especially for 100% combed cotton using Z and S twisted yarn results in stable and softer fabric. Alternate S and Z feeding at a circular knitting machine results in two major benefits.

- First, the fabric gets more stable; the screw effect is reduced to maximum. After several wash cycles the fabric keeps the shape and dimensions.
- Second, the fabric gets softer using S and Z twisted yarn. The touch of the cotton air-jet fabric gets closer to the touch of ring fabric but it still keeps the advantages of low hairiness, good pilling and wash resistance.

Yarn-like piecings

The quality of the piecing is defined by its strength and shape where yarn figures are the benchmarks.

The piecing process on the J 26 is fully automated and features fiber end preparation and Progressive Fiber Feeding (PFF) of new fibers. The PFF executes a process where fiber integration is optimally coordinated.

The yarn clearer checks each piecing for mass, i.e. diameter, and length, and guarantees that the piecing meets the requirements of downstream processing in full.
Cost-Saving Concept

Space and energy savings, more package weight and longer life-time

Space

The two-sided air-jet spinning machine J 26 with large 20˝ diameter cans under the machine requires much less floor space for the same out put compared to the competitor installation. This results in higher productivity for the same space, lower construction costs and also reduced air-conditioning costs.

Energy

The drive concept is based entirely on individual drives. In case of an end down, a quality cut or during maintenance work the spin unit consumes no unnecessary energy or compressed air.

The energy increase for vacuum is permanently monitored. Warning is given when the economical limit is exceeded. This can safe up to 15% of energy.

Long machines are equipped with a zoning suction system making sure the level of suction is uniform along the complete machine length and saving extra 5% energy.

Prolonged components' life-time

The unit is equipped with the unique, patented traversing mechanism. The components (condensers, spinning nozzle, APP nozzle and yarn clearer) traverse slowly from side to side and continuously guide sliver and yarn. This has a significant effect on the life-time of top rollers and aprons. As a result, maintenance work and spare parts costs are considerably reduced and quality is assured for a longer period.
Economy
The ways to produce yarn economically

Up to 108% more output and 128% higher contribution margin for the same production space

High productivity in combination with other cost-saving concepts provides the lowest yarn manufacturing costs and highest margins for applications. With the same available floor space, as in the example below of an 8 500 m² mill, output of the J 26 machine is up to 108% higher and production margins up to 128% higher compared to other air-jet spinning machines.

Lower labor costs thanks to:
- operator friendly machine concept of double-sided machine
- time saving sliver replacement
- less spin unit maintenance with the traversing system
- less package handling with heavyweight packages
- less package transport costs with heavyweight packages

Lower energy costs thanks to:
- optimized suction system, single drives and intelligent drive control
- reduced consumption of compressed air
- high production speeds

Less auxiliary costs thanks to:
- less spare parts thanks to the patented traversing system
- less number of empty tube thanks to high weight packages

Less capital costs thanks to:
- less floor space – less illumination and air-conditioning costs per kg of yarn
- high production speeds

Calculation example of a spinning mill capacity for 8 500 m² floor space:
Ne 30, blend polyester/cotton 40/60%
raw material price (blend): 1.336 EUR/kg; yarn price: 2.32 EUR/kg
Independent Machine Sides
Spinning two yarn qualities simultaneously

Machine with independent sides comprising:

- independent machine settings and shift reports
- independent suction channels and waste collection boxes
- individual spinning air pressure setting
- independent empty tube supply
- two package conveyor belts

The independence of two machine sides provides flexibility of operation, i.e. two completely different articles can be spun at the same time. The independent tube supply and separate package conveyor facilitate the work of operators. Productivity savings can be achieved when conducting spinning trials and changing production schedules.
Optimized packages

The new edge displacement makes package density more homogenous and edges softer. This is a prerequisite of best performance in weaving and knitting. Homogenity and soft edges enable excellent dye penetration.

Heavyweight packages of 300 mm diameter and up to 4.5 kg with the optimized package winding function reduce the number of package changes and thus increase machine productivity. For shipping, the more efficient utilisation of a container results in cost savings of about 20%.

Individual drives for perfect package quality

To wind a package with good quality, the parameters must be set individually at the operating unit. High-speed spinning requires individual drives for each winding unit. At the J 26, Rieter offers cylindrical and 4°20 conical winding with single drives. All parameters can easily be set at the operating unit. Settings can be done with respect to:

- Yarn length on the package
- Package density
- Winding tension during the package buildup
- Package dimension (length)
- Anti-patterning

The parameters for the package width can be set according to the yarn count. Coarser counts need a smaller width compared to finer counts. This allows optimum package quality with maximum package weight. The parameters for the stroke respiration can be activated and set at the operating unit. In four steps, the stroke respiration can be changed from a maximum to a minimum. This reduces the accumulation of yarn at the edges of the packages and makes the package edges soft.

The general density can be increased by changing the settings at the operating unit. The winding angle and the winding tension during the package buildup can be adapted in steps. This is comparable to a real precision winding. Thus, highest package weights with the same diameter can be achieved. Savings of about 20% of the shipping costs can be realized. With other settings, soft packages which are ready for dyeing can also be produced on the same machine. Additional steps as unwinding and winding the packages again – before and after the dyeing process – are not required. The high air-jet yarn quality can be preserved. On top of that, the costs of the additional unwinding and winding processes can be saved.

In general and especially with the critical diameters of the packages, real anti-patterning is required. According to the yarn length, the anti-patterning is done by varying the winding angle. This avoids yarn accumulation in one area of a package and ensures a perfect unwinding behavior.
**Easy Operation**

Clear and simple operating layout

The J 26 machine is built with two-sided sections, head stock and foot stock. The cans are located under the machine. The sliver can is therefore placed close to the associated spinning unit. The operator has a clear overview of the complete position when checking the unit, feeding in the sliver or changing the can.

The size of the cans and the high capacity of the tube loader significantly reduce operator efforts.

The short path from the can to the drafting unit eliminates the risk of false drafts. This is extremely important especially for fine slivers drafted at high speeds.
Easy spin unit operation

Patrolling along the machine the operator can check cans, spin unit and winding unit at the same time. Therefore activities like can exchange can be identified and carried out immediately. A new feature, the opening spin nozzle, supports further fast machine operation. In case of an operator request, the spin nozzle housing can be opened fast and easily to get full access inside for the purpose of spin tip cleaning. The spin unit can then get back fast into operation.
Machine Data
Automated air-jet spinning machine J 26

Dimensions

<table>
<thead>
<tr>
<th>Spinning units</th>
<th>Sections</th>
<th>Robots</th>
<th>L [mm]</th>
<th>W [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total machine length/min. handling space on each side</td>
<td>Total machine width/min. handling space on each side</td>
</tr>
<tr>
<td>40</td>
<td>2</td>
<td>2</td>
<td>11 597/3 500</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>5</td>
<td>4</td>
<td>20 512/3 500</td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>6</td>
<td>4</td>
<td>23 217/3 500</td>
<td>3 063/600</td>
</tr>
<tr>
<td>160</td>
<td>8</td>
<td>4</td>
<td>28 627/3 500</td>
<td></td>
</tr>
<tr>
<td>160</td>
<td>8</td>
<td>6</td>
<td>29 229/3 500</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>10</td>
<td>4</td>
<td>34 037/3 500</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>10</td>
<td>6</td>
<td>34 639/3 500</td>
<td></td>
</tr>
</tbody>
</table>

Can height/diameter [mm]  H [mm] total machine height  Crane height [mm]

| 1 070/up to 500 | 3 190 | 3 610 |
| 1 200/up to 500 | 3 320 | 3 740 |
### Technological data

<table>
<thead>
<tr>
<th>Raw material</th>
<th>Yarn count</th>
<th>Fiber specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% cellulosic fibers</td>
<td>14.7 – 24.6 tex</td>
<td>Ne 24 – 40</td>
</tr>
<tr>
<td></td>
<td>Ne 24 – 40</td>
<td>Nm 24 – 40</td>
</tr>
<tr>
<td></td>
<td>&gt; 1.3 dtex – ≤ 1.5 dtex</td>
<td></td>
</tr>
<tr>
<td>100% cellulosic fibers</td>
<td>11.8 – 37 tex</td>
<td>Ne 16 – 50</td>
</tr>
<tr>
<td></td>
<td>Ne 24 – 70</td>
<td>Nm 27 – 85</td>
</tr>
<tr>
<td></td>
<td>≤ 1.0 dtex – ≤ 1.3 dtex</td>
<td></td>
</tr>
<tr>
<td>100% cellulosic micro fibers</td>
<td>8.4 – 24.6 tex</td>
<td>Ne 24 – 70</td>
</tr>
<tr>
<td></td>
<td>Nm 40 – 118</td>
<td>&lt; 1.0 dtex</td>
</tr>
<tr>
<td>100% combed cotton</td>
<td>19.7 – 12 tex</td>
<td>Ne 30 – 50</td>
</tr>
<tr>
<td></td>
<td>Nm 50 – 85</td>
<td>≥ 1.0 dtex – ≤ 1.3 dtex</td>
</tr>
<tr>
<td>Blends of combed cotton and cellulosic fibers</td>
<td>14.7 – 29.4 tex</td>
<td>Ne 20 – 40</td>
</tr>
<tr>
<td>Blends of combed cotton and ≤ 50% polyester</td>
<td>16.7 – 24.6 tex</td>
<td>Nm 34 – 68</td>
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<tr>
<td>Blends cellulosic fibers and ≤ 80% polyester</td>
<td>11.8 – 24.6 tex</td>
<td>Ne 24 – 50</td>
</tr>
<tr>
<td></td>
<td>Nm 60 – 85</td>
<td></td>
</tr>
</tbody>
</table>

### Machine data

| Total draft                                       | mechanical 43 – 317 |
|                                                   | technological 170 – 220 |
| Total yarn count                                  | 8.5 – 37 tex/Ne 16 – 70/Nm 27 – 116 |
| Maximum delivery speed                           | 500 m/min |
| Spin nozzle housing                               | spin nozzle housing for Z or S twist |
| Spin tip                                          | 0.9/1.0/1.2 mm ceramic spin tip for different yarn counts |
| Package format                                    | cylindrical or conical 4°20* |
| Package dimension                                 | cylindrical packages up to 300 mm in diameter and 4.5 kg |
|                                                   | conical packages 4°20* with up to 240 mm diameter |
| Tube loader capacity                              | max. 412 tubes (206 for each side) |
| Waxing device*                                    | big wax blocks with 160 g, individually driven |
| Machine design                                    | double-sided machine with sectional construction |
| Spinning unit gauge                               | 260 mm |
| Drive concept                                     | individual drives for each spinning and winding unit |
| Winding unit                                      | winding unit with linear yarn distribution and edge displacement for soft edges |
| Sliver and yarn traversing system                | traversing of the sliver and yarn in the drafting zone by 3 – 4 mm |
| Independent machine sides                        | different article setting and reports for each machine side, two package transport belts and independent tube handling |
| Robots                                            | up to 6* robots (3 per each side) or 4 robots with option “prepared for 6 robots” |
| Automated piecing preparation                     | after a quality cut the spin units stops in a controlled way, the yarn fault is removed and yarn end prepared for piecing by the spin unit |
| Rieter yarn clearer Q 10 A* and Q 20AF*           | opto-digital sensor for Ne 16 – Ne 70 yarn counts, special air-jet cleaning channels and Q 20AF* including Foreign Fiber Detection |
| SPIDERweb*                                        | interface to SPIDERweb central mill monitoring system from blowroom to spinning machines |

* Option
Com4®jet
Yarn of choice
The Com4®jet yarn produced on the Rieter air-jet spinning machine is formed in a compressed air flow that winds the fibers around a parallel yarn core. Typical for the yarn are the very low hairiness and the high yarn volume. Decisive features over other air-spun yarns are the yarn-like piecings and the soft feel. The downstream processor profits from a minimal fiber fly and low dyeing agent requirement for comparable color intensity. The end product excels by its low pilling tendency, high washing resistance and dimensional stability.

**Yarn characteristics**
- Unique low hairiness
- High volume
- Low tendency for fluff
- High abrasion resistance

**Process advantages**
- Low dyestuff for comparable colour intensity
- Low snagging tendency
- Lowest generation of dust and fiber fly

**Fabric appearance**
- Low pilling tendency
- High water absorption
- High wash resistance

**Typical end products**
- Knitwear in general
- Outerwear
- Underwear
- Bed linen
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2887-v3 en 1905