TRÜTZSCHLER SPINNING

combing

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The new Comber TCO 21

Top combing performance thanks to reliable Trützschler technology. The TCO 21 is also based on the reliable Trützschler drive technology for combers and thus unfolds its full effect - more maintenance-friendly, flexible and precise than conventional solutions.

High productivity

up to 600 nips / minute
thanks to 2TWIN DRIVE
and DUAL DRIVE

Perfect yarn quality

with COUNT MONITORING
(standard) or COUNT CONTROL
(option)

Automatic optimization

of the piecing point with the
PIECING OPTIMIZER

Simple, intuitive operation

with SMART TOUCH, RFID and
T-LED

Low maintenance

Original Trützschler electronics
with long service life

High productivity up to 600 nips / minute

The Comber TCO 21 achieves a high combing speed of 600 nips per minute with stable running behavior and minimal vibration. This is made possible, among other things, by the double-sided drive technology specially developed for the TCO 21 in Germany.

Two highly dynamic 2TWIN DRIVE servo motors on each drive side and the DUAL DRIVE gear units on both sides ensure completely synchronous running behavior (see p. 10).

The high combing speed of the machine, in combination with the 1200 mm diameter jumbo cans, leads to high production efficiency.

More information:

or click here:

Trützschler Comber TCO 21

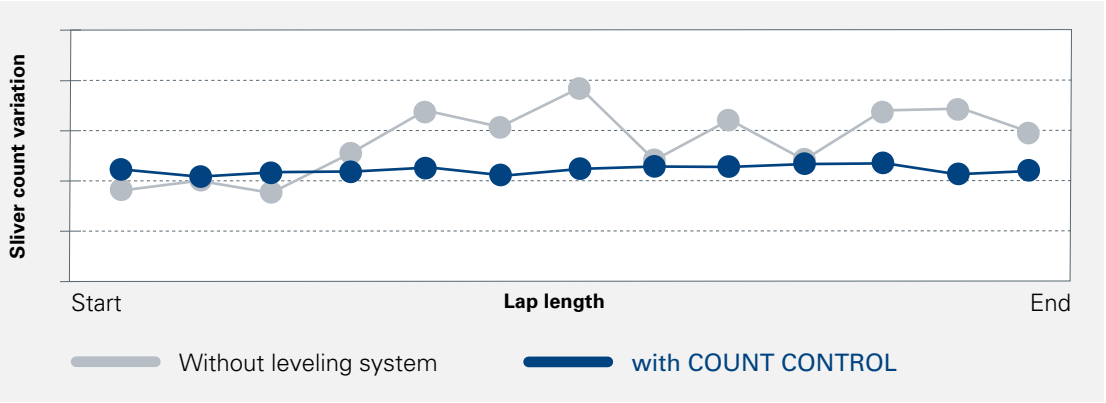
Perfect yarn quality thanks to COUNT MONITORING and COUNT CONTROL

COUNT MONITORING and COUNT CONTROL sliver count monitoring and automatic draft setting for reliable sliver count stability.

COUNT MONITORING – standard in TCO 21

- Quality control through individual limit values for count variations - visualized by T-LED. If the DISC MONITOR sensor measures an exceedance, the machine issues a warning and switches off.
- with integrated spectrogram analysis for higher quality.

COUNT CONTROL - optional leveling

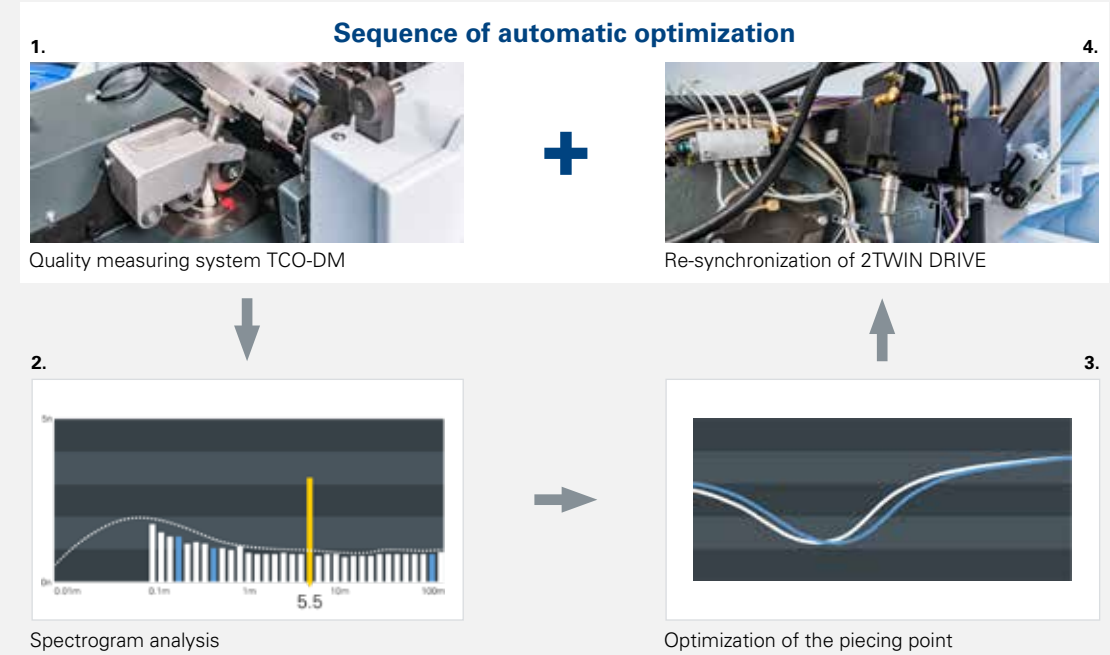


If COUNT MONITORING detects a variation in the sliver count, COUNT CONTROL ensures reliable leveling in the drafting system, leaving the lap tension unaffected and thus ensuring constant combing quality.
The result is a permanently consistent sliver count for first-class yarn quality!

Saving one draw frame passage:
Concerning sliver blends, the COUNT CONTROL shows advantages in avoiding blend fluctuations. Depending on the application, tests show that in this case one draw frame passage can be saved.

Piecing point setting made easy

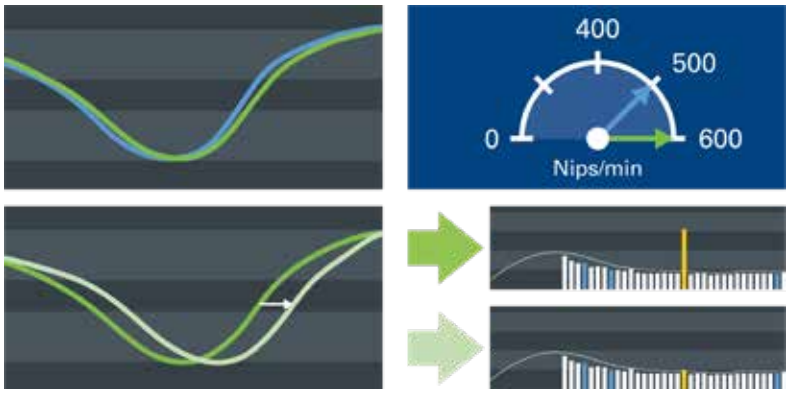
Automatic optimization by the PIECING OPTIMIZER: A clean solution



A spectrogram analysis is carried out with the aid of the quality measurement system TCO-DM. If optimization of the piecing point is necessary, the 2TWIN DRIVE servo drives are resynchronized

Only Trützschler combers have an automatic and thus clean setting of the piecing point. Setting via change gears in the oil bath of the gearbox is not necessary. This ease of use makes setting very simple and efficient. This allows our customers to quickly adjust the value to changing production parameters; after all, if a parameter cannot be easily changed, it is not often adjusted in everyday spinning operations.

By decoupling the drives with 2TWIN DRIVE and DUAL DRIVE, the TCO 21 is the only comber on the market with the option of changing the detaching curve. This means that accelerations can be adapted to production requirements during pilgrim step movement.



CURVE FUNCTION

Additional curve, optimized for perfect yarn results even at high nip rates. The curve visualizes the pilgrim step movement of the detaching rollers.

TIMING FUNCTION

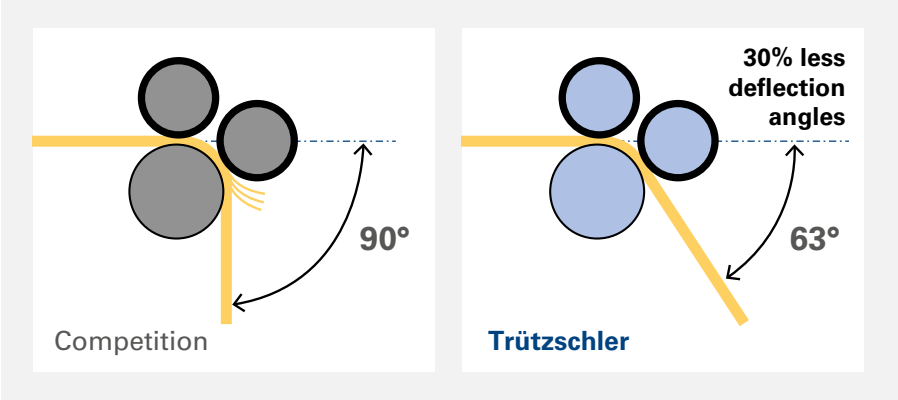
Automatic optimization of the piecing point without a single laboratory test for perfect sliver and yarn CV values.

Proven drafting system technology

The Comber TCO 21 as well as all Trützschler draw frame types are equipped with the same proven 4-over-3 drafting system.

Reliable drafting system components

- 4-over-3 drafting system with reduced deflection angle
- Adjustable pressure bar for controlled and gentle fiber guidance
- Pneumatically loadable top roller
- Self-adjusting lap monitoring
- Patented bearing technology for minimum heat generation and thus low wear of the coatings

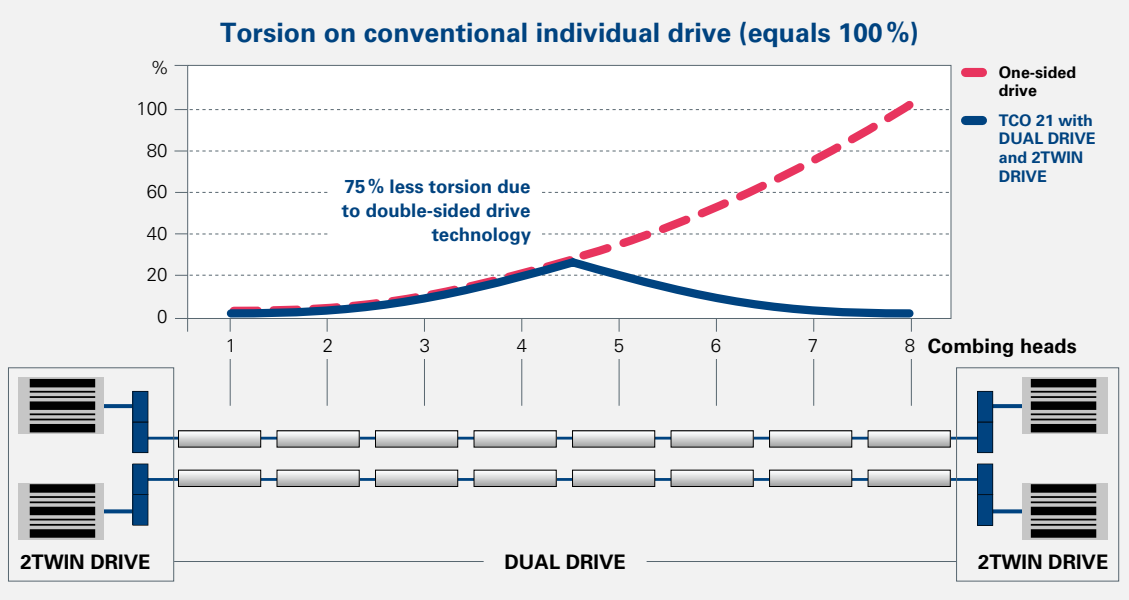


Optimal drafting system geometry for gentle fiber guidance, best CV values and optimal running behaviour

The unique arrangement of the drafting system components with a 30 % smaller deflection angle results in optimal running behaviour even with very fine sliver weights and in particular highly parallelised fibers such as combed slivers or slivers for the air jet process.

Decoupled motion sequences - maintenance-friendly technology

Only the Trützschler Comber TCO 21 offers a double-sided drive technology, which has now been improved even further.

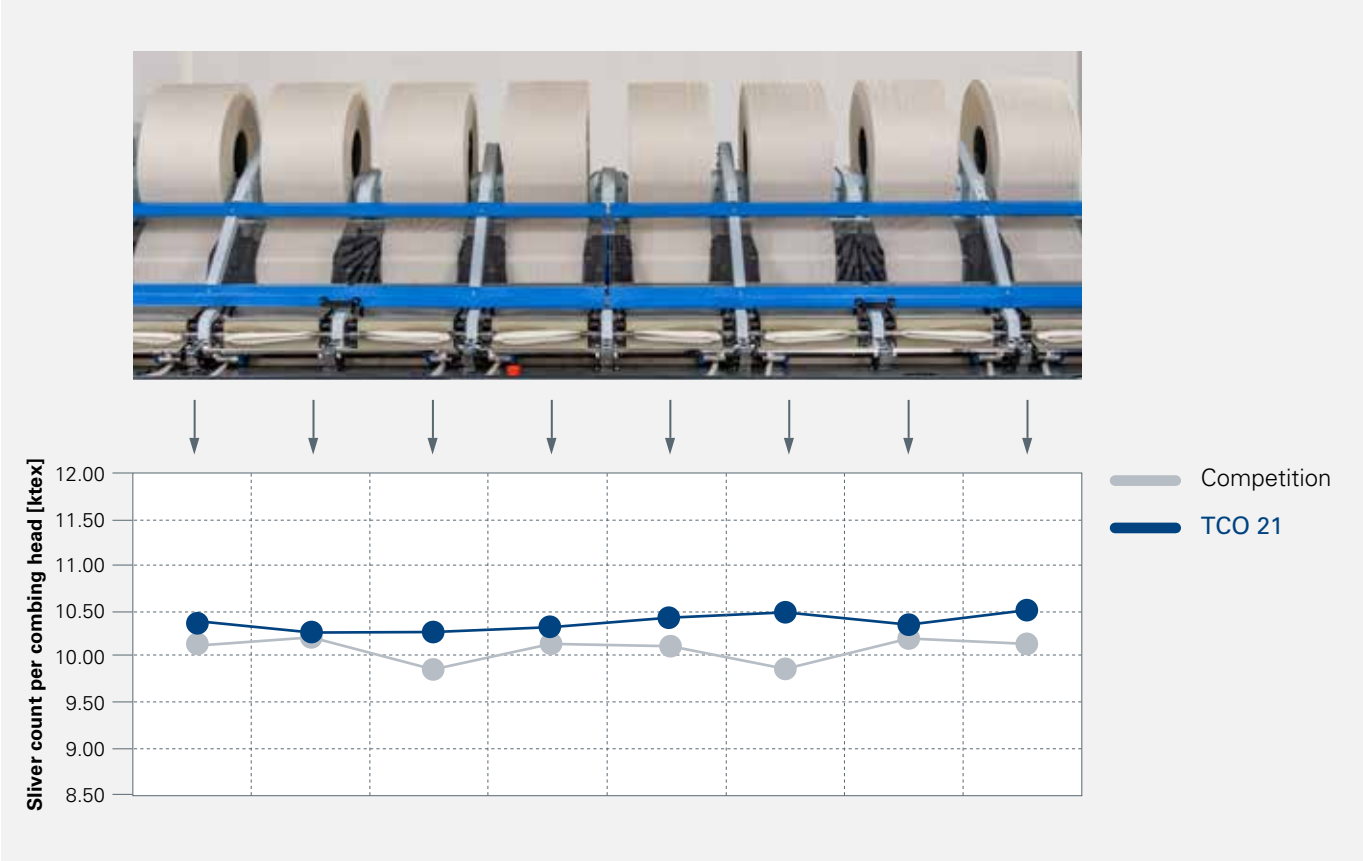


Two highly dynamic servo motors on each drive side.

In the concept of the TCO 21, the detaching roller are driven on both sides by the 2TWIN DRIVE, the two-by-two highly dynamic servo motors. For the circular comb and nipper shafts, this is achieved by the DUAL DRIVE gearboxes on both sides. This ensures completely synchronous running and fully identical movements on all combing heads.
It is not difficult to understand that with shafts up to 4 m long, a non-negligible amount of torsion, i.e. twisting, occurs when they are driven on one side. With the Trützschler concept, this torsion can be reduced by 75 %, thus guaranteeing a uniform combing result.

This innovative drive technology allows a decoupling of the highly dynamic movement sequence of the detaching roller from the main shaft that controls the movement of the remaining combing components. This makes application-oriented optimization of the piecing process with the PIECING OPTIMIZER possible.

Same quality from head to head



With the TCO 21, smaller sliver count variations from combing head to combing head.

Precisely uniform distances between the nipper and the detaching roller and between the nipper and the circular combs also have a major influence on quality. On the TCO 21, the detaching distance is individually aligned on each combing head at the factory. The distance between the circular combs can also be precisely adjusted during machine assembly, resulting in minimal distances.

This leads to more uniform combing results with significantly lower head to head variations in combing quantities and sliver counts.

Detaching distance and circular comb distance are set individually on each combing head.

Operation - as simple as with a Smartphone

SMART TOUCH and RFID detection

SMART TOUCH

The monitor forms the interface between the operator and the machine. For the first time, it is designed as multi-touch technology. Operation is just as intuitive as using a Smartphone or tablet.

Identification via personal chips

The control recognizes the person and the authorization by the chip. This way, the operator only receives the information he needs to fulfill his role.

Trützschler remote display T-LED

More overview in combing with T-LED

T-LED visualizes important production parameters, such as the currently produced quality. The operating states of a machine can thus be read even at a great distance with the help of the remote display T-LED.

The remote display T-LED brings more overview to combing.

More information:

or click here:

Trützschler Remote Display T-LED

Interested in quality or quantity? Adapt the T-LED display to your needs.

In automatic mode, specific information on certain parameters is displayed in a widely visible manner during regular machine production. Selectable display modes are:

- A% sliver count variation

- CV% value

- Can filling

If there is a warning for a possible pending machine stop or a machine malfunction, the machine automatically switches to the corresponding status displays.
T-LED can indicate specific causes, e.g.:

- Present warning

- Error at combing heads

- Empty can magazine

T-LED helps to detect and correct faults immediately.

Less downtime → Higher machine efficiency → Higher productivity

More performance, less maintenance

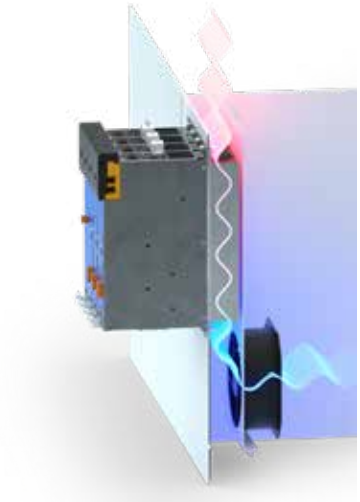
Trützschler electronics set standards for performance and service life

The new TCO 21 uses many proven Trützschler electronic components such as drive axes or sensors.

Only the components developed by our engineers have been perfected for use in the spinning mill environment. They offer first-class performance without unnecessarily complicated and failure-prone additional functions, but with a long service life.

The use of intelligent control cabinet cooling also leads to an increase in the service life of important electronic components, as heat is efficiently dissipated.

The compact design of the control cabinet of the TCO 21 with the Trützschler drive axes and the Trützschler energy meter.



Intelligent control cabinet cooling, which leads to an increase in the service life of the electronic components.

The correct pressure for optimum machine performance

Especially on the comber, the top roller loads of the detaching roller play an important role with regard to the running characteristics of the machine.

With the TCO 21, the pressures can be set specifically and monitored digitally. This results in better running behavior and longer service life of the coatings. Automatic relief of the top roller at standstill prevents lap behavior and thus increases machine efficiency.

Improved accessibility in the area of the drafting system

The software monitors the following pressures:

- Pneumatic system pressure (inlet pressure)
- Suction pressure (ensuring disposal)
- Load pressures of the detaching top roller

Improved handling for higher production

Possible maintenance work is quick and easy thanks to the coupled flaps on the noil collectors. To reduce downtime to a minimum, all covers of the noil ducts on the TCO 21 can be opened simultaneously with a single hand movement and clogs can be easily removed.

Automatic lubrication system

The TCO 21 is optionally equipped with the practical automatic lubrication system. However, manual lubrication has also been greatly simplified via central distributor bushings.

Below-floor design for 600mm diameter cans

The below-floor variant enables safe and easier can transport.

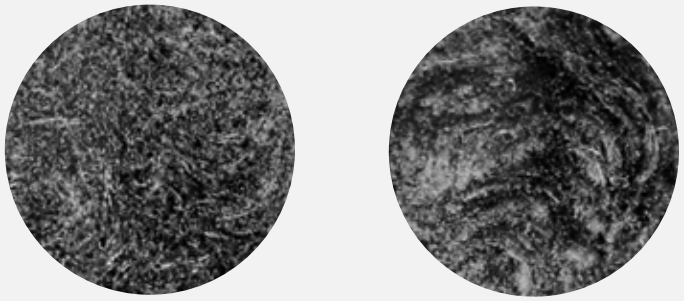
Above-floor variant

Below-floor variant. No ramp. Easier can handling.

Combed cotton for tuft blending

A logical consequence of the annual growth in world fiber volume is the increasing use of blend yarns.

Advantage of the tuft blend in comparison with a draw frame blend



Tuft blending after 2nd draw frame passage

Draw frame blending after 3rd draw frame passage

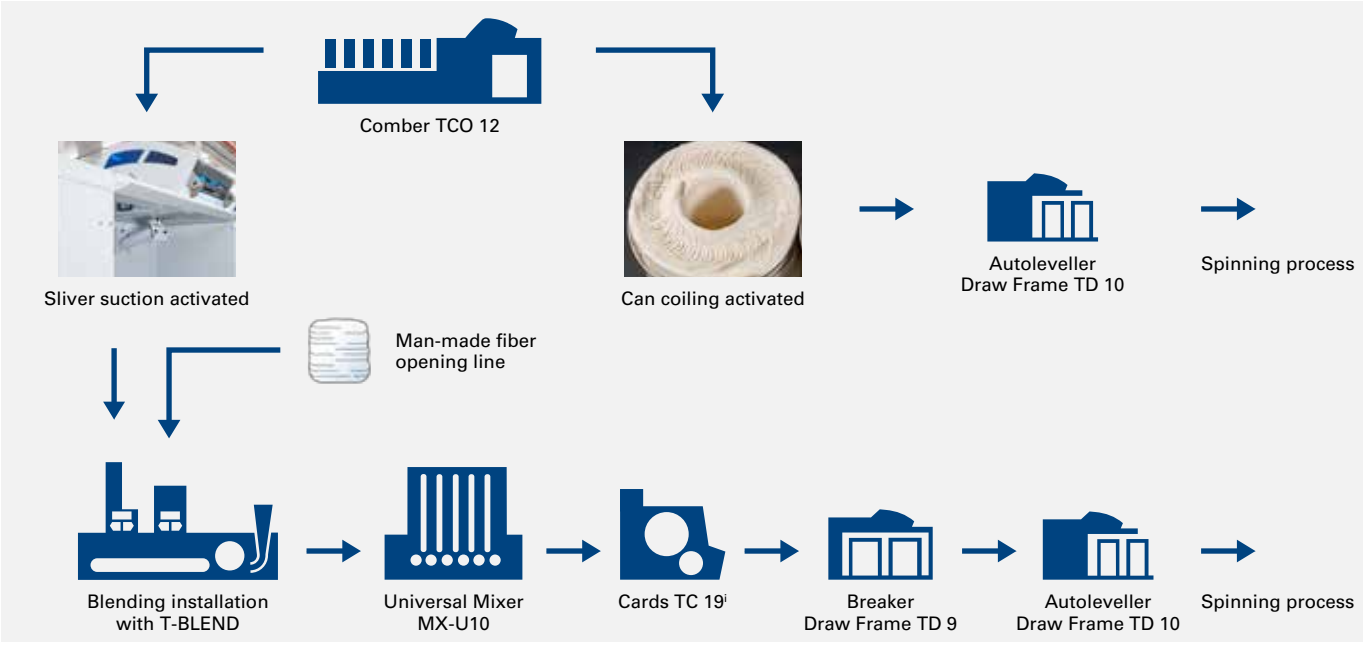
But even when using blends with cotton, manufacturers would like to take advantage of the quality improvements made possible by the combing process.

With the sliver suction module of the TCO 21 it is possible to extract the combed fibers directly after the drafting system and then blend them on the Tuft Blending Installation T-BLEND.

Since the machines are generally designed to be flexible for normal can delivery and sliver suction, simple handling is a priority.

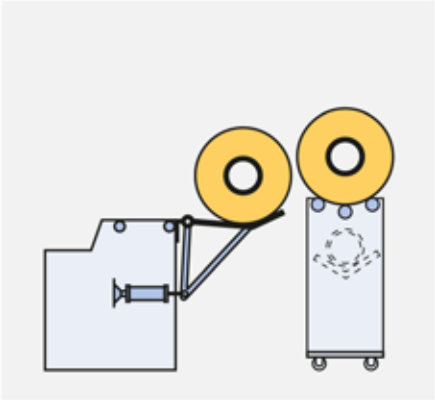
The suction nozzle can be attached underneath the drafting system with just a single movement. The straight combed sliver is then fed to a separate suction unit.

The necessary production of the machine is transmitted to the combing machines via material requirements of the blowroom. If there is no material requirement, the comber stops automatically to prevent problems in the blowroom.



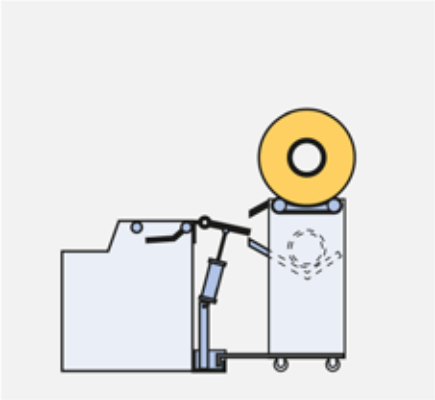
Lap transport and lap feeding

Three versions for maximum individuality



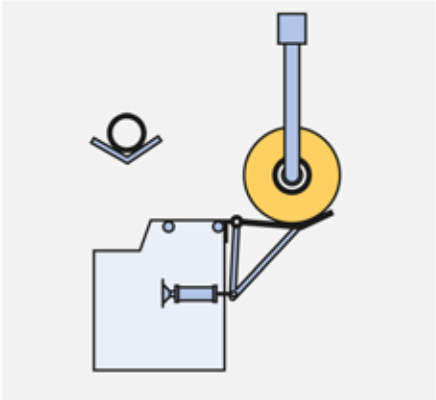
Manual transport and manual feeding

The laps are transported to the comber by means of a lap carriage. There the laps are tilted from the reserve table into the combing positions; the operator pieces the laps manually.



Manual transport and semi-automatic feeding

Instead of the reserve table, the lap transport carriages act as storage space for full laps. First the empty tubes are put in the carriage via a transfer table, then the laps are placed in the combing positions. There they are manually pieced.



Automatic transport and manual feeding

An automatic lap transport system (LTS) brings the laps from the lap winder to the comber. There the laps are fed to the combing positions via the reserve table and manually pieced. The empty tubes are automatically returned to the TSL by the transport system.

The picture shows the lap transport unit of the lap transport automation (LTS).

Meaningful automation

The automatic lap transport system for the Trützschler combing mill

Developed in cooperation with Neuenhauser, the specialist for automated spinning mill transport systems, the automated lap transport in combing is one of the most meaningful investments. In addition to personnel cost savings compared to manual lap transport, even more benefits become apparent in practice:

Clarity

Since the entire transport is performed overhead, the aisles remain unobstructed. There are no empty lap tubes or transport carriages in the way. The floors are easy to clean.

Controlled material flow

An automatic lap transport system brings the lap to the exact comber where it is needed next. No comber is down because a lap is missing, even during a night shift with reduced personnel.

Quality gain

Since the laps are not touched by the operators, the outer layer of the batt remains as perfect as when leaving the Superlap. During manual transport, the very sensitive outer layer of the lap can easily be damaged when touched.

The transport unit forwards the full lap from a conveyor belt on the TSL to the combers. In the process, the empty tubes are also picked up and returned.

Equipment and options

Trützschler Comber TCO 21

Coiling	Coiler plate with HYDRO POLISHED TUBE prevents deposits	●
	Automatic sliver separation unit during can changing	●
	Automatic linear changer	●
	Above-floor and below-floor can changer for all can diameters	○
General	Integrated quality monitoring DISC MONITOR (sliver count, sliver evenness, integrated spectrogram analysis)	●
	Technology package standard	●
	Technology package fine count	○
	Lap tubes TCO-LT	●
	Good access to all maintenance and cleaning points	●
	Safety panels with central safety system	●
	Central, flow-optimised suction with negative pressure monitoring (above and below floor)	●
Drives	Modern, energy-saving drives with robust Trützschler electronics	●
	Individual drives for infinitely variable setting of sliver count and delivery speed	●
	Individual can plate drive for optimized sliver coiling	●
	Individual drives for feed and delivery roller of the drafting system (with COUNT CONTROL)	○
	Draft setting via COUNT CONTROL	○
	DUAL DRIVE - double-sided drive concept for combing elements	●
	2TWIN DRIVE – low torsion individual drive technology for the detaching roller	●
Electronics	Large color multi-touch screen for efficient operation, maintenance and service	●
	Use of dynamic Trützschler Computing Unit, only one update for all machine components	●
	Remote display T-LED	●
	Maintenance management via touchscreen	●
	Interface for data transmission to data acquisition systems My Mill and My Production	●
Combing station	Reserve table TCO-RT for the lap transport carriage TCO-LC1	●
	Reserve table TCO-RT incl. empty tube storage for automatic lap transport system LTS	○
	Semi-automatic lap feeder TCO-LF for the lap transport carriage TCO-LC2	○
	Feeding for laps up to 650 mm diameter and 300 mm width	●
	Circular and top combs from Städtler and Uhl	●
	Circular and top combs from Graf	○
	PIECING OPTIMIZER with timing and curve function for optimum detaching curve and piecing point	●
	Equipment for forward and backwards feeding (feed amounts 4.3 / 4.7 / 5.0 / 5.2 / 5.5 / 5.9 mm)	●
	Automatic lubrication system TCO-AG	○

● = Series ○ = Option

Drafting system	4-over-3 drafting system with pressure bar and short sliver guidance in the can	●
	Gentle sliver deflection for process-safe sliver formation and reduced lap formation tendency	●
	Self-adjusting lap monitoring of top roller	●
	Durable cleaning bar for top roller for gentle cleaning	●
	Integrated, flow-optimized suction of the drafting system at top and bottom roller	●
	Quick relief during standstill or lap formation	●
	Process-safe, pneumatic, automatic web threading	●
	Lifetime lubricated top roller bearing for low heat generation and reduced lap formation	●
	Pneumatic load of top roller individually, infinitely variable	●
	COUNT MONITORING – sliver count monitoring	●
	COUNT CONTROL – Levelling system for perfect sliver count consistency	○

● = Series ○ = Option

Technical data

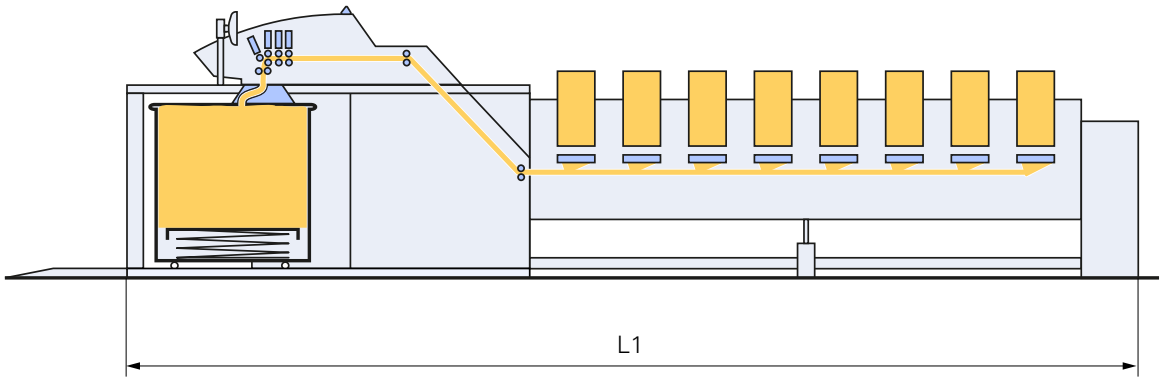
Trützschler Comber TCO 21

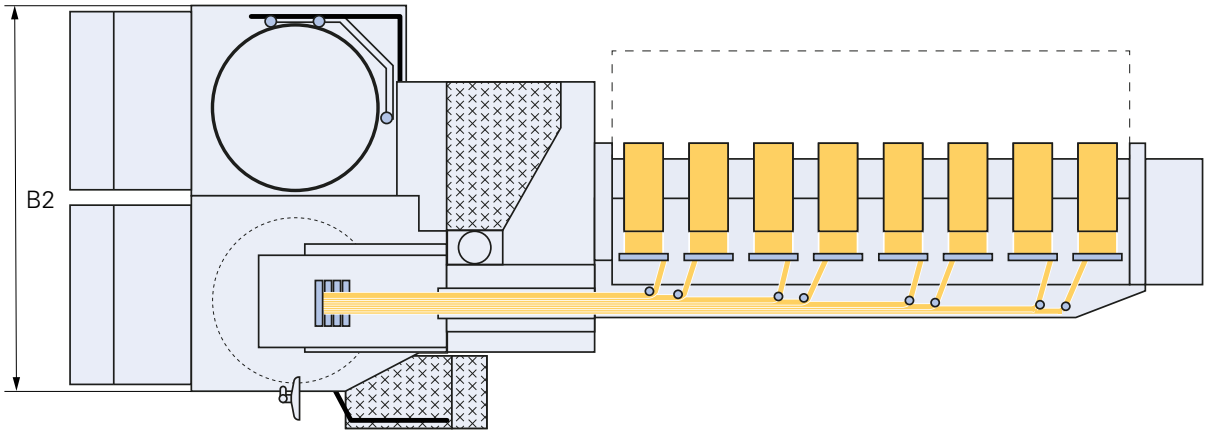
Sliver coiling system	Maximum delivery speed	m/min	380
	Can diameter	mm	600/1,000/1,200
	Can height	mm	1,200
	Continuous production	ktex	3 – 6
Energy	Air volume of suction	m³/h	2,800
	Negative pressure of suction	-Pa	- 430
	Average continuous electrical power consumption at 500 nips	kW	6 – 6.6
	Compressed air requirement	Nl/h at 7 bar	326.3/357.8/339.9
General	Material: Fibers	mm	max. 60
	Draft	fold	9 - 25
Combing station	Maximum nip rate	Nips/min	600
	Production	kg/h	100
	Lap weight	kg/unit	25 (net)
	Material feed / lap count	ktex	60 - 80
	Feeding		Forward/backward
	Ratch-wheel feeding	Number of teeth	16, 17, 18, 19, 20, 22
	Circular combs		Staedler & Uhl: 9225, 9226, 9286 Graf: 8015, 9015, 9030
	Top combs		Staedler & Uhl: 26, 28, 30, 32 Graf: C26, C30
	Noil extraction	%	8 – 25

Technical data

Trützschler Comber TCO 21

	Output cans		
	Ø 600 mm	**Ø 1,000 mm**	**Ø 1,200 mm**
L1 mm	6,725	7,160	7,330
B2 mm	1,640	2,400	2,800





The Superlap TSL 12

Only the interaction of clever lap change, individually controllable and maintenance-free direct drives allows ultra-fast lap changes. In addition, perfect calendering ensures clean unwinding and thus first-class lap quality.

Less downtime, more production

Efficient lap change
and operation with
SMART CREEL
Longer creel running times
thanks to JUMBO CAN

Optimum lap quality, optimum combing result

Perfect triple calendering and
preparation of the lap with the
3-over-3 drafting system

Low operator stress

Optimum individual automation
solutions with the lap transport
system and semi-automatic
lap feeding

Different material - one quality level

Precise adaptation of drafting
and tension thanks to multidrive
technology


TSL 12

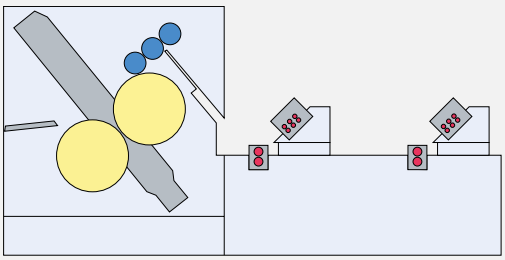
Clever technology for high productivity

The Superlap produces premium quality laps with its multi-drive technology, consisting of four individually controllable and maintenance-free direct drives.

Lap change time in 20 seconds

This means 15 % higher productivity with the same settings

Thanks to this technology, important process parameters such as drafts, tensions and lap pressure can be adjusted during lap build-up. Thus, the lap separation can be implemented directly by the drives; there is no need for complex mechanisms prone to failure.
This ensures first-class lap quality with uniform lap hardness. This results in particularly good unwinding properties.

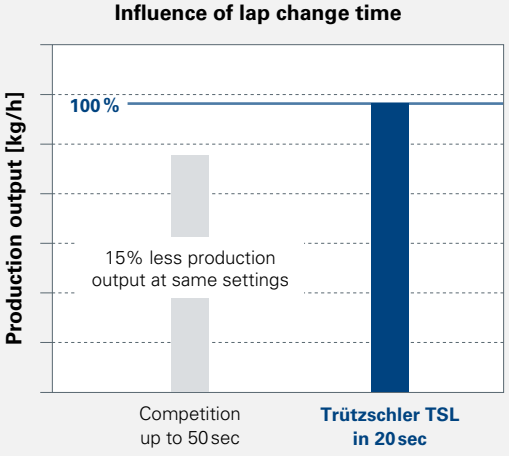


Individual drives make an optimization of the lap build-up possible.

- Pressure calender
- Lap calender
- Draw frame heads with table calenders

Fastest lap change time – Increased productivity

Lap changes in 20 seconds are only possible due to the individual drive technology and a clever tube change system. The empty tube on the TSL is inserted laterally at the same position where it is also wound shortly after.
With 400 lap changes per day, a 15 % increase in production means 60 more produced laps per day.



The unique lap tube feeding device allows quick lap change

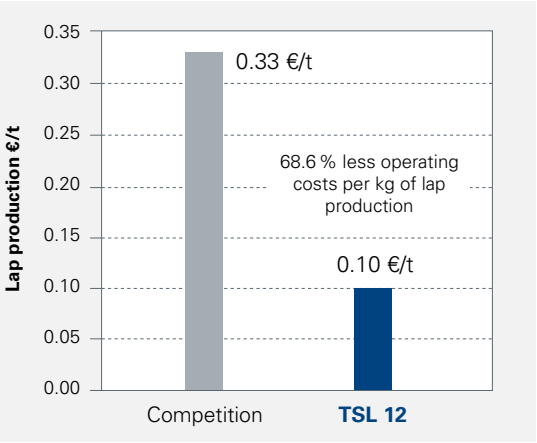
The empty tubes are fed from the side through an opening in the panel. This Trützschler development reduces the time required for lap change, which has a significant influence on efficiency.

Perfect calendering

Consistently high lap quality guaranteed

Laps must have the same properties from the first to the last metre.
On the one hand, this requires a uniform batt weight and on the other hand a perfect unwinding behaviour on the comber.
In order to meet both requirements, the multi-drive technology enables variable drafts during the winding process. Only with the TSL 12 is it possible to significantly influence the appearance of the laps via the tension between the two lap calenders.

Operating costs for suction and compressed air



The table calender units prepare the batt after each drafting system.

1 Pressure calender module:
Preparation of the batt by removal of air pockets
2 Lap calender module:
Winding of the batt onto the empty tube
3 Table calender units

Independent guidance of new batt

The concept with only three pressure calenders also makes piecing of the new batt after cleaning the machine super easy. Complex threading tools are no longer necessary, as the batt finds its way by itself.

Energy-efficient compressed air system

The lap calender technology leads to considerable reductions in compressed air consumption and thus offers attractive savings in running costs. This is clearly reflected in the kilogram price of lap production: 0.33 € per kilogram at the competition compared to 0.10 € per kilogram at Trützschler.

Perfect calendering to ensure a good lap unwinding behaviour on the comber

The calender unit uses three pressure points (●). In addition to the pressure points between the pressure calender roller, there is also a calendering point to a lap calender roller.

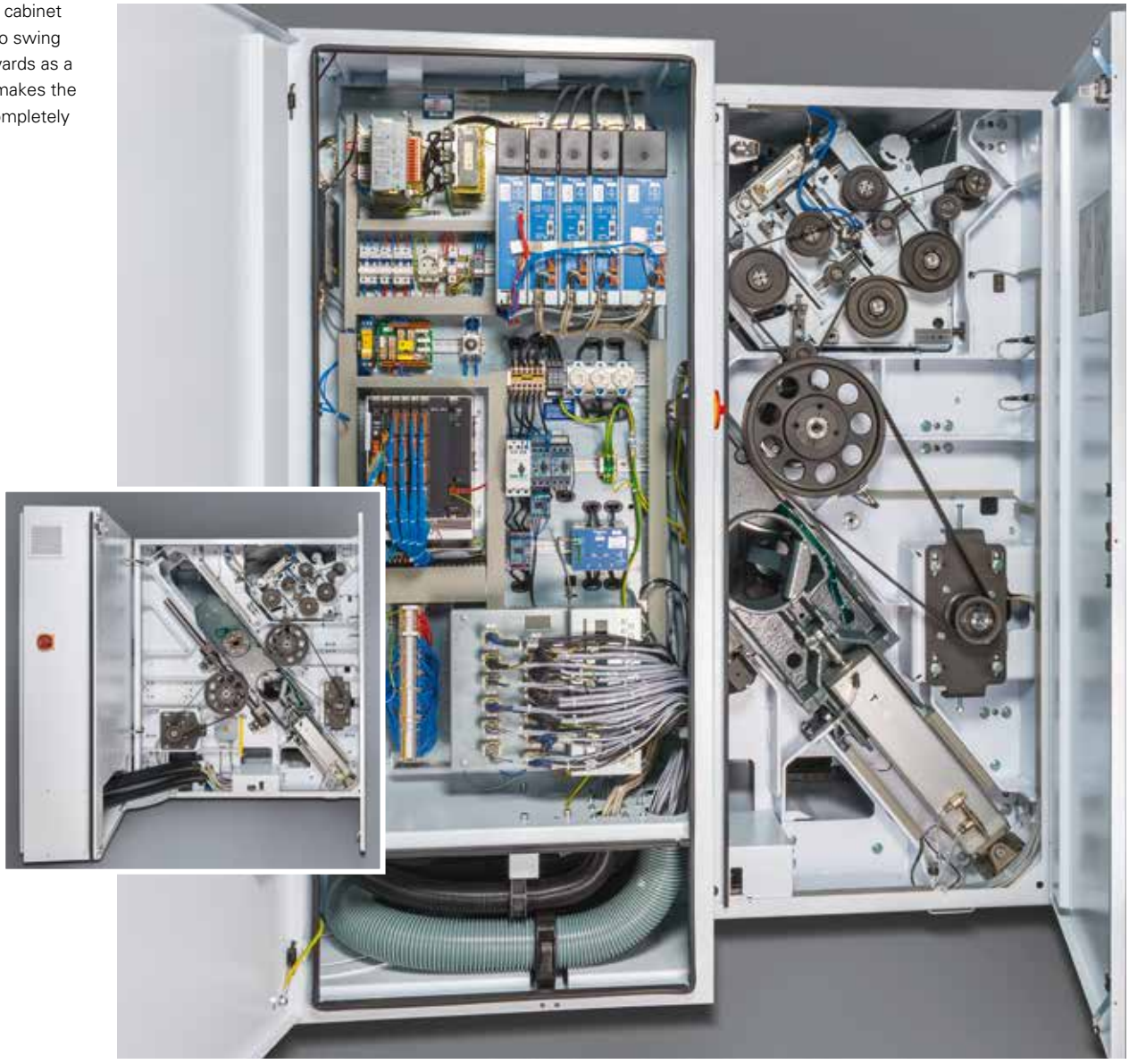
Electronics/Drive technology

State-of-the-art control and convenient operation:

As a pioneer in the use of state-of-the-art drive technology in spinning preparation machines, it is our aim to ensure optimum quality and optimum handling with new innovative solutions at the lowest possible energy consumption.
Applying our own control electronics allows customized solutions for use in the field of spinning.

The control of the TSL is of course also based on the Trützschler Computing Unit, the heart of the machine.
Thanks to the Trützschler energy measuring device, the energy consumption can easily be called up via My Mill. This way you always have the energy in sight when something is out of the ordinary.

The control cabinet is as easy to swing open sidewards as a door. This makes the machine completely accessible.



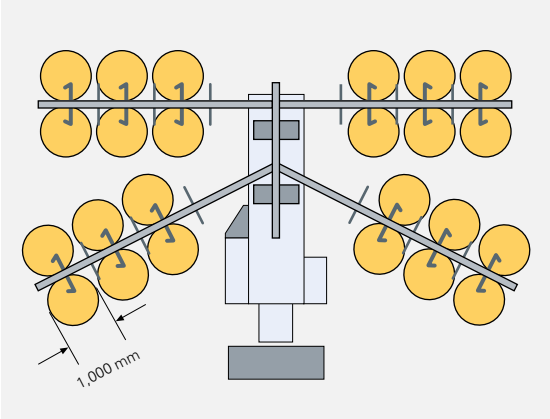
SMART sensors also for the Superlap

The new intelligent individual sliver sensors distinguish between

- Sliver is moving
- Sliver is available, but not moving
- Sliver is not available

This allows reliable detection of sliver breaks at every delivery position and eliminates errors in the batt weight due to missing slivers.

Individual sliver sensor in SMART CREEL



The butterfly shape of the creel allows good accessibility and requires only little space even when using large cans.

The top roller of the 3-over-3 drafting system are opened with the upper part of the drafting system and can easily be removed.

User-friendly handles facilitate the transport of the lap carriage.

Equipment and options

Trützschler Superlap TSL 12

General	Good access to all maintenance and cleaning points	●
	Safety panels with central safety system	●
	Central, flow-optimised suction with negative pressure monitoring (above and below floor)	●
	Individual adjustment of the lap pressure via the lap build-up	●
	3 pressure calender with individually adjustable pneumatic load	●
	Large-area filter TD-FB with negative pressure monitoring	○
Drives	Modern, energy-saving drives with robust Trützschler electronics	●
	Individual drives for infinitely variable adjustment of lap count, main draft and lap tensions	●
Electronics	Colour touchscreen for efficient operation, maintenance and service	●
	USB port	●
	Use of dynamic Trützschler Computing Unit, only one update for all machine components	●
	Maintenance management via touchscreen	●
	Energy measuring device for online energy monitoring	●
	Interface for data transmission to data acquisition systems My Mill and My Production	●
Creel	Two-row feed creel with intelligent individual sliver monitoring via SMART sensors (600 mm cans)	●
	Creel version for 1000 mm cans or JUMBO CANS	○
Drafting system	3-over-3 drafting system with monitoring device and sliver guide elements	●
	Self-adjusting lap monitoring of top roller	●
	Durable cleaning bar for gentle cleaning of the top roller	●
	Integrated, flow-optimized suction of the drafting system at top and bottom roller	●
	Quick relief during standstill or lap formation	●
	Lifetime lubricated top roller bearing for low heat generation and reduced lap formation	●
	2 table calender units for preparation of the batt	●
	Pneumatic load of top roller individually, infinitely variable	●

● = Series ○ = Option

Technical data

Trützschler Superlap TSL 12

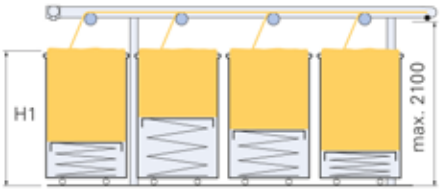
Sliver coiling system	Maximum delivery speed	m/min	180
	Can diameter	mm	600/1,000/1,200
	Can height	mm	1,075 - 1525
	Continuous production	kg/h	518
Energy	Air volume of suction	m³/h	2,800
	Negative pressure of suction	-Pa	-800
	Installed power of drafting system table	kW	3.45
	Installed power of lap head	kW	16.05
	Installed power of filter box	kW	2.5
	Average continuous electric power consumption	kW	7.3
	Compressed air requirement	Nl/h at 7 bar	4,200
General	Material: Fibers	mm	max. 60
	Draft	fold	1.2 – 3
Calender / Drafting system	Lap weight	kg/unit	25 (net)
	Material feed / lap count	ktex	60 – 80
	Sliver weight	ktex	4 - 5
	Lap width	mm	300
	Lap tube diameter	mm	200
	Lap length	m	300

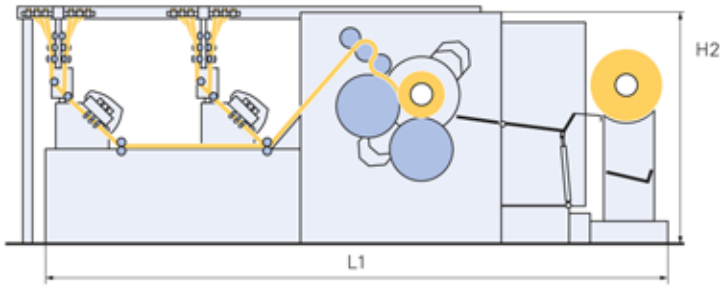
Technical data

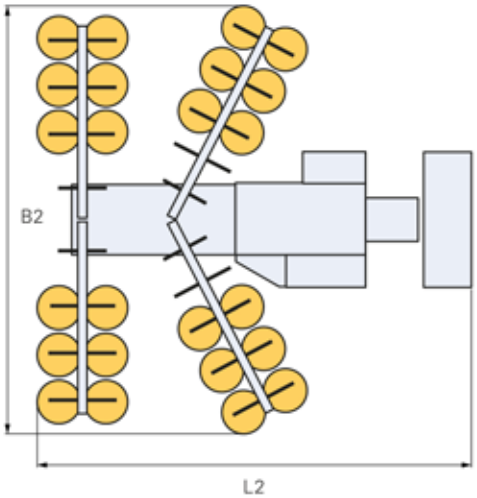
Trützschler Superlap TSL 12

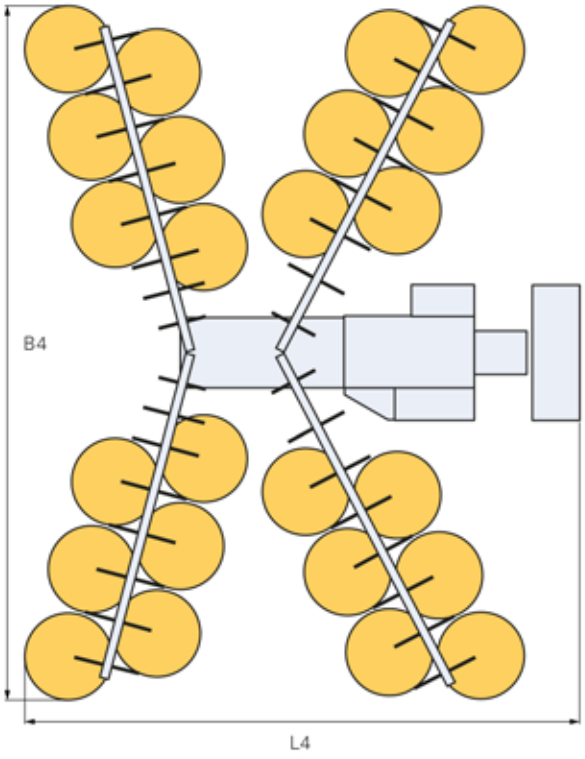
L1 mm	5,513
H1 mm	1,075 - 1,525
H2 mm	2,070

	Creel cans		
	Ø 600 mm	**Ø 1,000 mm**	**Ø 1,200 mm**
L2 / L4 mm	5,994	6,319	7,662
B2 / B4 mm	5,909	9,027	9,586







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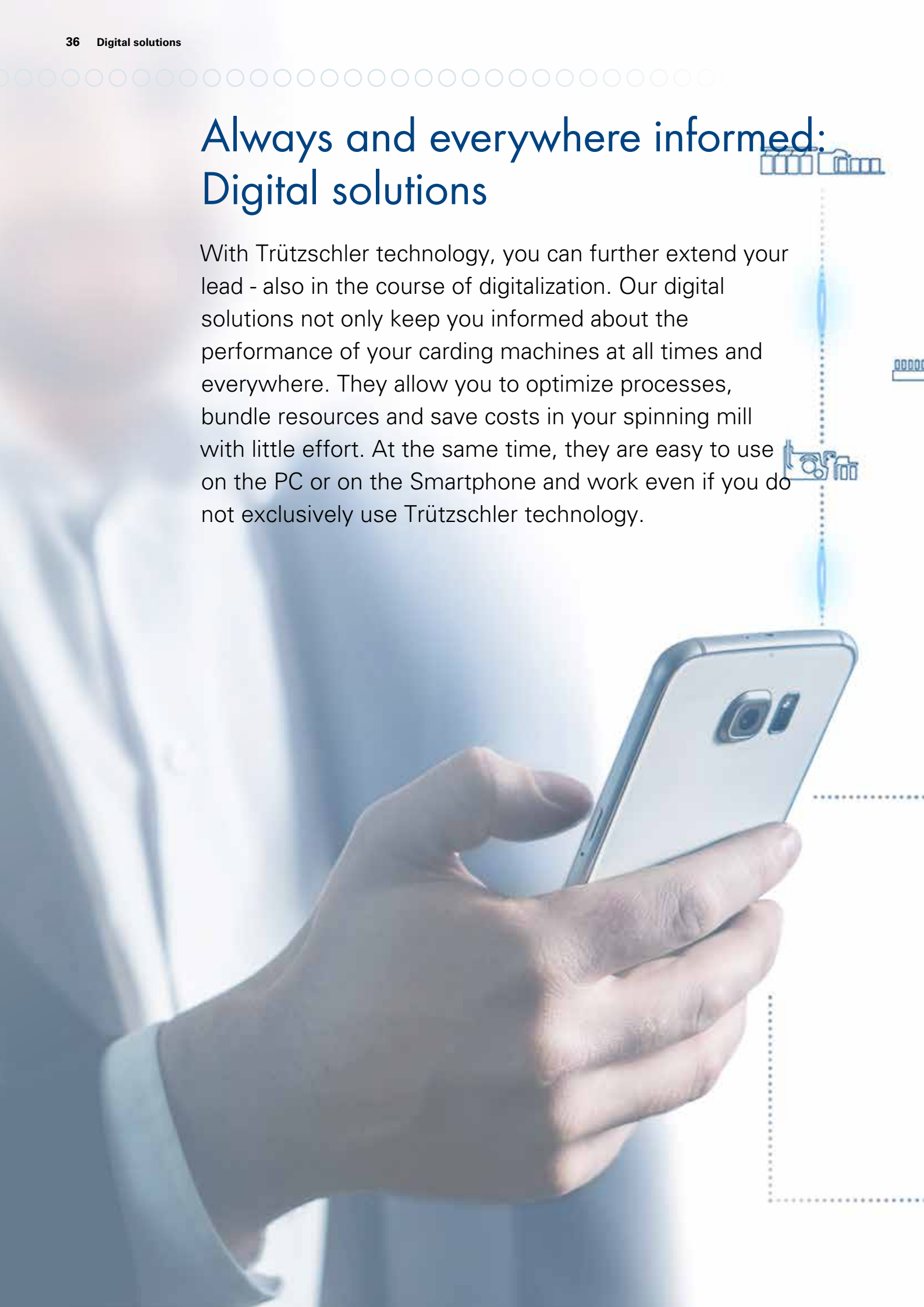
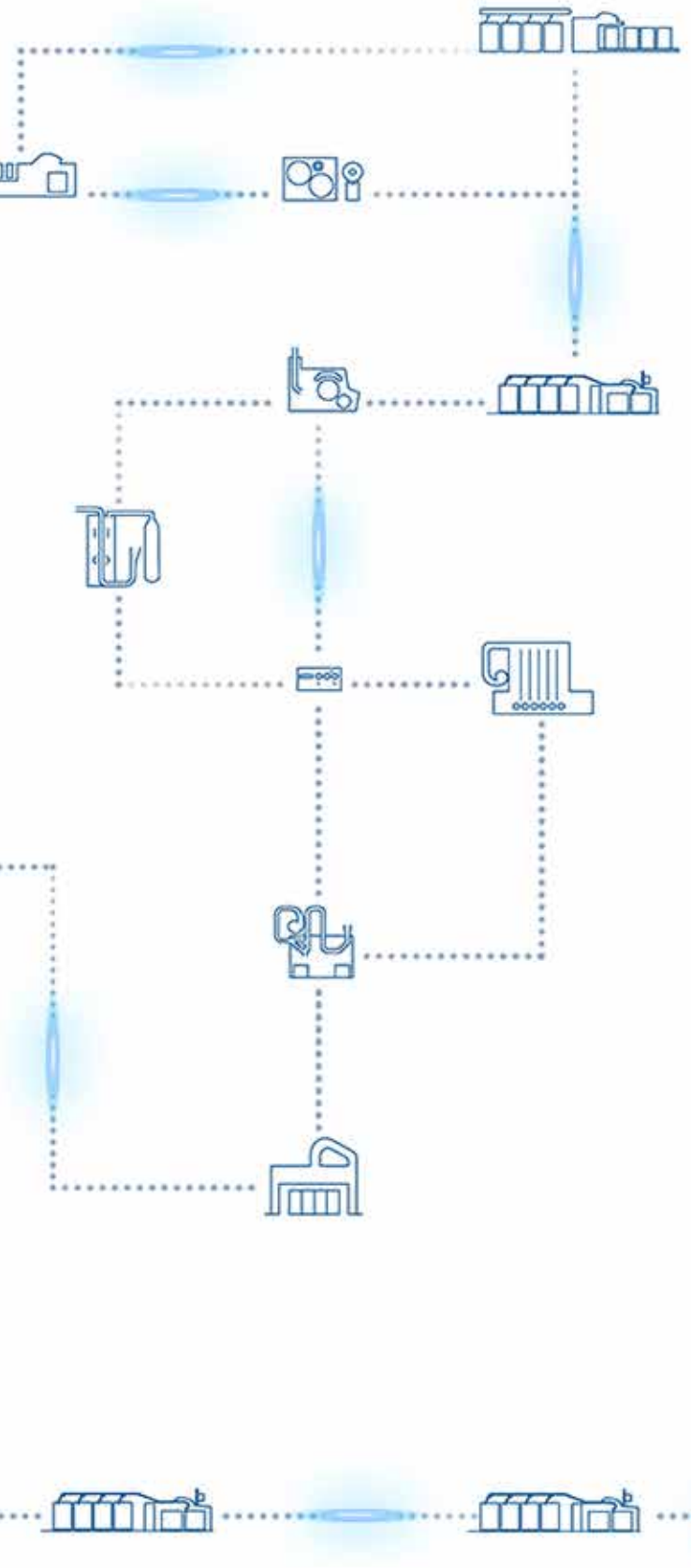
Always and everywhere informed: Digital solutions

With Trützschler technology, you can further extend your lead - also in the course of digitalization. Our digital solutions not only keep you informed about the performance of your carding machines at all times and everywhere. They allow you to optimize processes, bundle resources and save costs in your spinning mill with little effort. At the same time, they are easy to use on the PC or on the Smartphone and work even if you do not exclusively use Trützschler technology.





My Mill

More information:

or click here:

My Mill

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My Production

More information:

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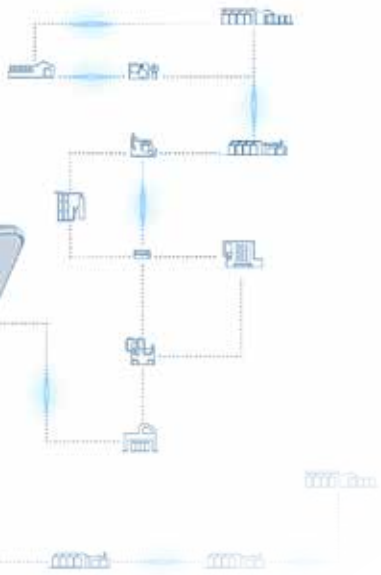

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