

SPINNOVATION

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Innovations to Unlock Efficiency

Like no other, the berkolizer pro takes
UV treatment to the next level

PRODUCT NEWS

- 04 **Rolling towards New Levels of Efficiency**
Unlike any other, the berkolizer pro provides consistent and adjustable UV treatment
- 06 **Unprecedented Technology for Air Covered Fancy Yarns**
SSM *fancyflex* creates limitless effects, 20 to 30 times faster with less manpower
- 10 **Graf Carding Boosts Recycled Yarn Quality**
New recycling card clothing packages to unlock the potential of yarn manufacturing
- 12 **An Innovation at the Heart of Rotor Spinning Machines**
TQ rotors offer high yarn strength and enhanced spinnability

TECHNOLOGY

- 14 **Reimagining Texturing Discs**
Temco CoolFlow discs offer longer lifetime and lower process costs
- 16 **Universal Aprons for Increased Performance**
The new Accotex apron NO-79201 shows higher performance and flexibility
- 18 **Precisely Centered Spinning Rings Influence Hairiness**
Bräcker ensures reliable results without deviations
- 20 **Ensuring Competitiveness through Spindle Expertise**
How to choose the right spindle for production success
- 22 **Leverage Carding Maintenance to Boost Productivity**
Flexible service packages and extended service station footprint

SUCCESS STORIES

- 24 **Becoming the Amazon of Yarns**
How TURKTEX responds in no time to customers' demands and offers over 1 000 different yarns
- 26 **Convincing Results with COMPACTeasy at Arvind**
Compacting system increases production by 10%

Cover:

With a capacity which covers the output of two conventional UV machines, the berkolizer pro is considerably more efficient than any other in its category.

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Dear valued reader,

Innovation has always been a driving force behind our products. We are constantly striving to create added value for our customers by implementing new technologies. In this issue of Spinnovation, we present the berkolizer pro from Bräcker, a breakthrough in UV treatment machines. The rolling process and unique controllability of the UV light intensity provide consistent and full irradiation of cots for a superior quality.

We also would like to highlight fancyflex, the world first and only technology to create limitless effects at the air covering stage. This exclusive software by SSM allows customers to stand out from competition with highly distinguished and innovative products.

Furthermore, the TQ rotor, a new addition to the Suessen ProFil rotor family, enables considerable energy savings and longer service life.

Since the last edition, two new members joined the Rieter Business Group Components, Accotex (elastomer components for spinning machines) and Temco (bearing solutions for filament machines). The acquisition of the two market-leading companies completes our large portfolio and further improves our market position as well as our competence in the filament market. Sharing our values, Accotex and Temco constantly break new ground and provide ingenious solutions to customers. This is the case with the Accotex NO-79201, a new generation of aprons with improved performance and increased lifetime and with the CoolFlow discs from Temco, featuring a unique geometry and the latest polyurethane technology for longer lifetime and lower process costs.

We have extended the Graf service station footprint with the opening of three spots in Uzbekistan, Bangladesh and Vietnam. Together with our local agents, this will further strengthen our service offering and accelerate customers' growth.



Making a difference for our customers, we have two exciting success stories from Turktex, Turkey's leading company in the high value-added continuous filament sector and Arvind, one of the Indian leading players in the textile market. With the SSM DP5-T, Turktex is able to keep up with the fast-paced market of synthetic yarns and offers an unequalled range of fabrics, in no time.

Always at the top of its game, Arvind successfully installed Suessen's COMPACTeasy, a mechanical compacting solution, resulting in 10% increase in production.

These and many other innovations enable our customers to reach new levels of competitiveness and stay at the top of their games.

Enjoy your reading,

A handwritten signature in black ink, appearing to read 'S. Entleitner', written in a cursive style.

Serge Entleitner
Executive Vice President Business Group Components

Rolling towards New Levels of Efficiency

Unlike any other, the berkolizer pro provides consistent and adjustable UV treatment

Through innovative design and technology, the last born of the BERKOL maintenance machines, the berkolizer pro, optimizes the exposure of rubber cots and controls the intensity of the UV light, which ensures an optimal, consistent, and energy-efficient UV treatment. The berkolizer pro is suitable for universal use with all types of axles, in lengths up to 450 mm and for cots with diameters up to 52 mm.

With proper maintenance, the quality of cots can be ensured over their entire service life. This maintenance consists of regular grinding, resulting in the optimum roughness of the cot surface, and UV treatment. Exposing freshly ground cots to UV light smooths the surface of the cot, making it less aggressive for the fibers. It reduces the risk of lapping, prevents fiber loss during the spinning process and thus increases productivity. Through optimal exposure, the berkolizer pro offers the best surface quality available on the market.

Optimal exposure and unrivaled capacity

Three factors affect the quality achieved when exposing cots to UV rays: time, intensity, and consistency.

The best exposure time of cots depends on the hardness of the rubber and the application. For instance, assuming an optimally ground cot (Ra 0.8), an average rubber shore hardness of 65 (e.g. ring spinning cots for combed cotton), and a diameter of 30 mm, the recommended exposure time is 3 min.

High temperatures have a negative impact on the quality of cots. Controlling the intensity of the UV light is key as it increases the UV lamp efficiency and keeps the heat production to a minimum. The berkolizer pro is the only machine available on the market to manage UV intensity. Besides, it features a powerful cooling system (Fig. 1) which ensures the best quality, even with high ambient temperatures.

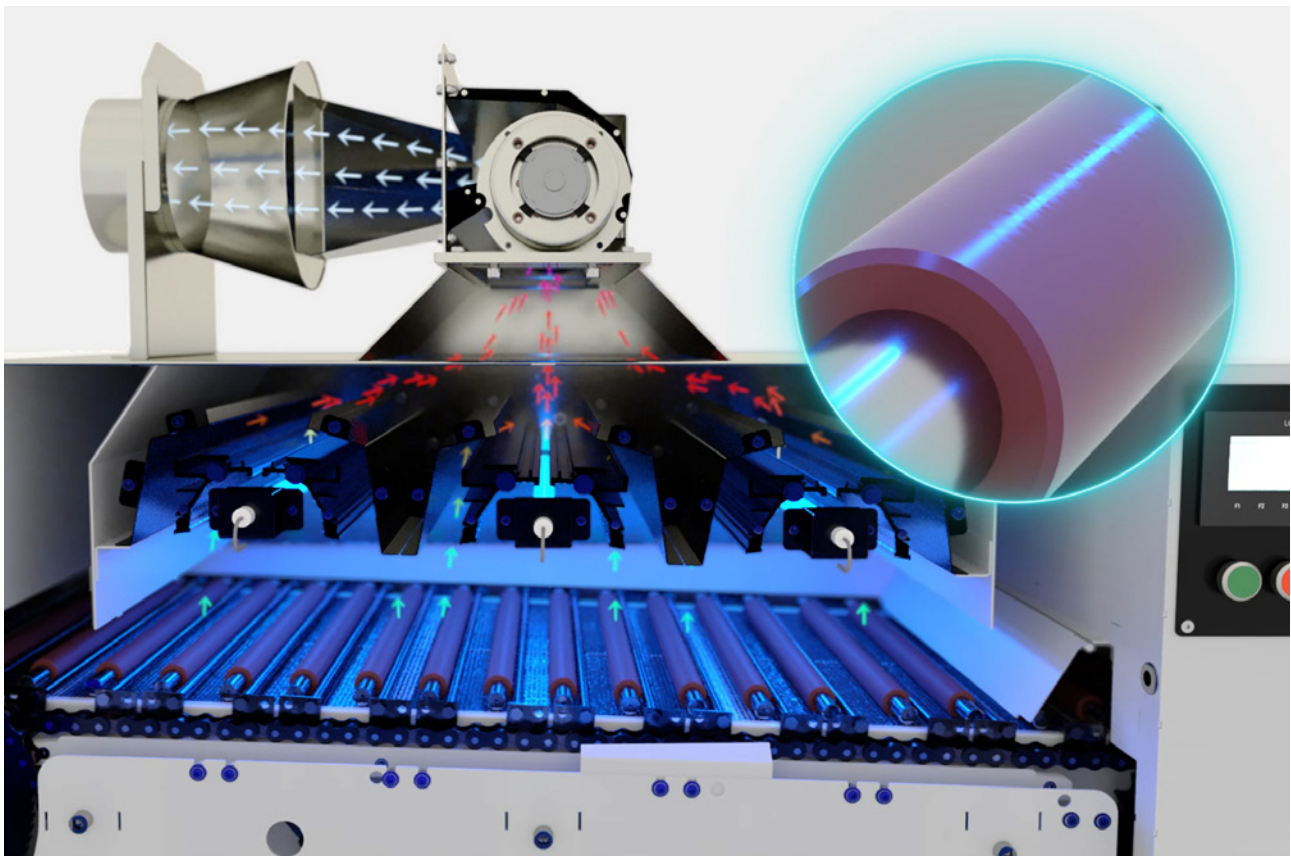


Fig. 1: The efficient UV cooling system contributes to a superior quality of the cot's surface.

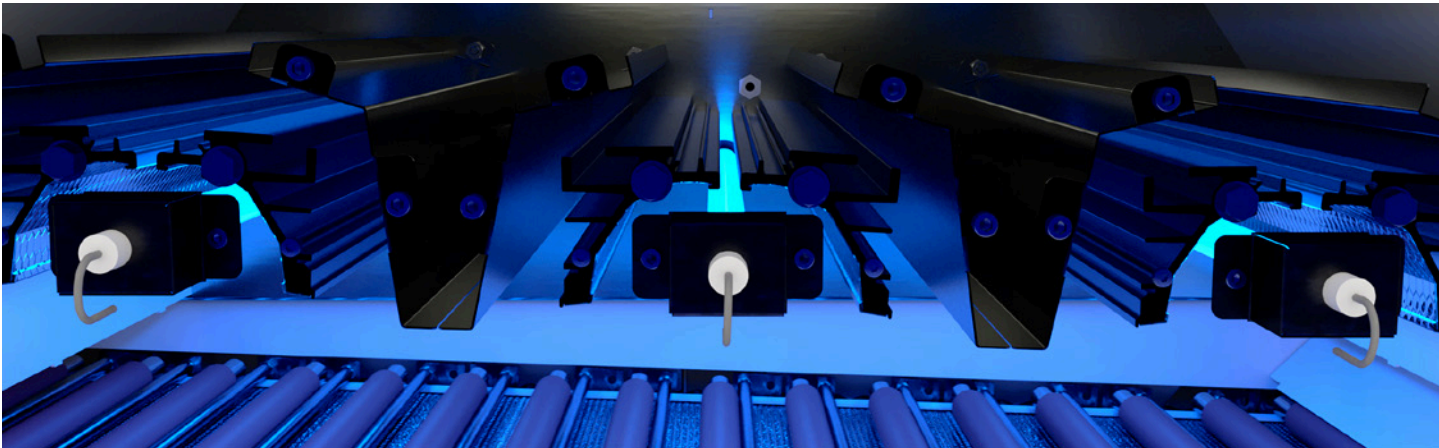


Fig. 2: The unique reflector system ensures consistent irradiation of the axles, regardless of their geometric complexity.

The berkolizer pro features a rolling processing system which provides the same exposure conditions of all axles. In addition, a unique reflector system (Fig. 2.) ensures a complete exposure, over the entire circumference and width of the axles. With a consistent and full irradiation, the highest possible quality is achieved.

Pushing limits

Thanks to its wide feed unit (Fig. 3), the berkolizer pro can process simultaneously up to three axles, or any axles with a length up to 450 mm.

Compared to traditional feeding of cots, the rolling process of the berkolizer pro offers automation and controllability. There is no need to switch the UV lights on and off which optimizes their service life. Both the rolling speed and light intensity are adjustable and can therefore be set to optimize performance and energy efficiency

Overall, the berkolizer pro is considerably more efficient than others in its category. Its capacity covers the output of two conventional UV machines, leading in space, energy and manpower savings.

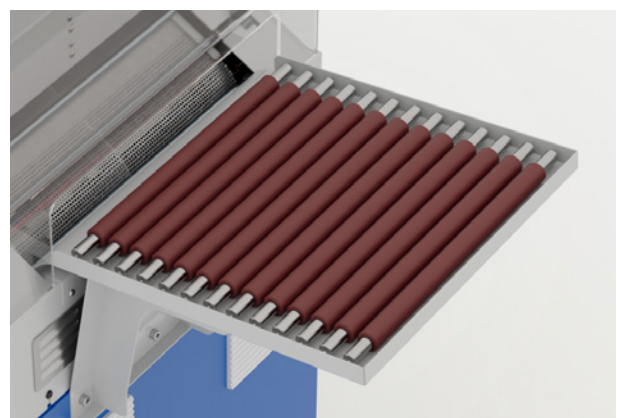
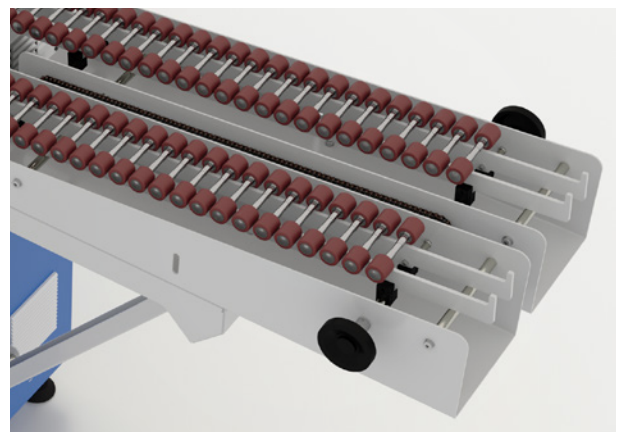


Fig. 3: Universal use for all types of axles, in lengths up to 450 mm and for cots with diameters up to 52 mm.

Unprecedented Technology for Air Covered Fancy Yarns

SSM *fancyflex* creates limitless effects, 20 to 30 times faster with less manpower¹

With *mélange* or heather fancy effects growing in popularity, manufacturers need to produce unique textiles that stand out from conventional plain color fabrics at reasonable costs. In a world first, SSM *fancyflex* technology enables the creation of an infinite range of customized knitted or woven fabrics with novel effects at the air covering stage.

Although spun and twisted fancy yarns have been established for decades, there are very few air-jet processed fancy filament yarns. SSM already offers some options for filament yarns such as Partially Oriented Yarn (POY) or Fully Drawn Yarn (FDY), using DP5-T and DP5-FT in air texturing or false twist texturing respectively. Now, *fancyflex* enables the creation of fancy yarn directly from Drawn Textured Yarn (DTY) at the air covering stage – an innovation as never before.

More effects with the same raw material

With *fancyflex*, manufacturers can create a wide range of colors by using different primary colored dope-dyed yarns thus

reducing the supply material inventory to a minimum. Using the same raw material, it is also possible to combine cationic and standard polyester yarns at the air covering stage, providing even more color effects that will be revealed after dyeing. The software features two options, VARIO – including VARIO color, VARIO stretch and VARIO 3 colors – and fancy intermingling to unlock limitless colors and designs.

One software for endless possibilities

fancyflex VARIO, developed by SSM for its XENO-AC, is the world's first controlled color-changing fancy option for the air covering process. The patented technology creates controlled speed variations to the feeder roller, causing changes of color or dullness in the final DTY or FDY yarn.

Without the need for any mechanical modifications, *fancyflex* VARIO can be installed on any standard XENO-AC (Fig. 1), using a combination of two plies. An additional elastane or Lurex² thread can be inserted to the final yarn for stretch or shiny aesthetic properties³.



Fig. 1: SSM XENO-AC using the *fancyflex* technology offers limitless effects with outstanding quality.

¹ Compared to the process of creating fancy effects in twisting and spinning, ² Lurex is a registered brand name of the Lurex Company, Ltd.,

³ See Spinnovation No. 35 for more information about Lurex applications.

fancyflex VARIO color changing option

The exclusive SSM software controls the two plies independently, feeding them into the intermingling jet with a simple two-step cycle or random time settings. The *fancyflex* VARIO creates different types of effects, from rapid color change (Fig. 2a) to soft color gradients (Fig. 2b). Additionally, the time settings can be randomized to generate different fabric length cycles (Fig. 2c).

SSM has also developed a pattern mode to produce yarns that require a higher level of complexity than the two-step setting. In fact, unlike the random setting, the pattern mode provides a sequence with up to 40 different individually programmable steps, enabling absolute control over the fabric design (Fig. 2d).

fancyflex VARIO stretch feature

fancyflex VARIO stretch allows users to vary the stretch of the elastane in the yarn. The resulting fabric has a particular shape, suitable for fashion fabrics or technical applications requiring different compression levels. The knitted samples (Fig. 3) show an examples of the structure created using the VARIO stretch option.

fancyflex VARIO 3 colors overfeeding upgrade

To further support the yarn conception, *fancyflex* VARIO is upgradable to VARIO 3 colors, with a slight modification of the yarn path. This additional overfeeding device, available for yarn designers to create fancy yarns out of three distinct supply colors, enables an endless choice of color shades.

Knitted samples using *fancyflex* VARIO with two colors:



Fig. 2a: Sample using *fancyflex* VARIO rapid color change

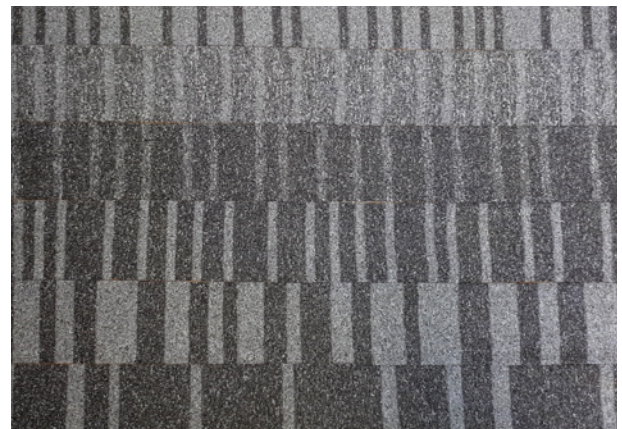


Fig. 2c: Sample using *fancyflex* VARIO with randomized settings

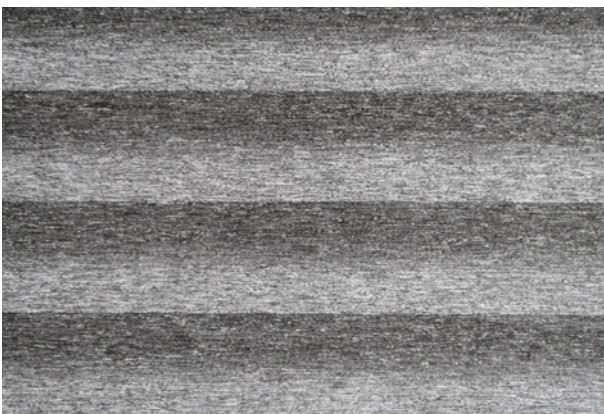


Fig. 2b: Sample using *fancyflex* VARIO soft color gradients

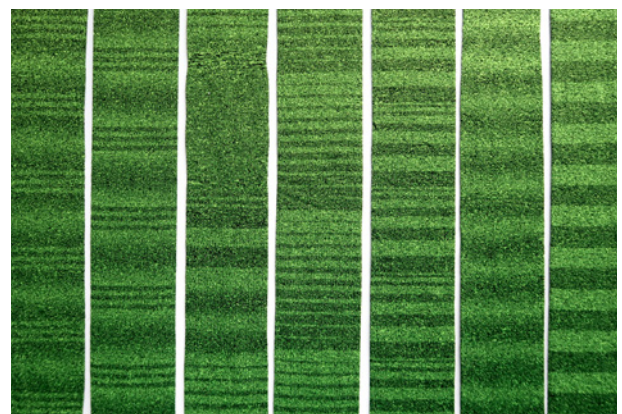


Fig. 2d: Sample using *fancyflex* VARIO with pattern settings

Knitted samples using fancyflex VARIO with varying stretch



Fig. 3

Different color effects can be obtained using, for example, two different 8-step patterns with the same combination of cyan, magenta, and yellow yarns (Fig. 4a and b). Both have the same cycle time, but one with long-changing times (Fig. 4a) and the other with short-changing times (Fig. 4b). The result is a shade with a slow color change effect on one sample (Fig. 4a), while the other shows a distinct color band effect (Fig. 4b).

fancyflex intermingling option

With the intermittent intermingling option, the air supply is interruptible for a defined interval of time. A high-speed valve installed ahead of the air covering jet alternatively opens or shuts down the air pressure supply. Upon comingling of different colored threads, it is the air interruption that creates a color-change effect, where either one or the other color appears alternately.

Woven samples using fancyflex VARIO 3 colors



Fig. 4a: Sample using fancyflex VARIO 3 colors with long-changing times

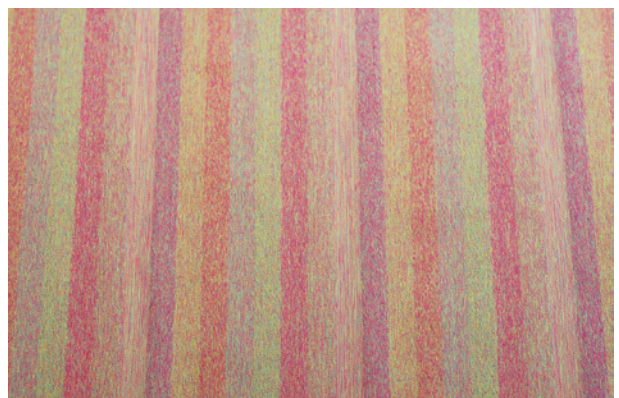


Fig. 4b: Sample using fancyflex VARIO 3 colors with short-changing times

Several fancyflex effects are combinable in the same yarn; for example, intermittent intermingling with the VARIO. Figure 5a shows an example of knitted fabric produced with fancyflex VARIO, with the intermingling option. Figure 5b shows the same fabric without intermingling. fancyflex VARIO can also apply long disturbance cycles to black and white threads to create a long shading effect, or short sequences to the red thread to generate red stripes. The comingled black, white or red thread appears on the fabric surface when the air supply is interrupted by the intermittent intermingling option, creating short colored stripes (Fig. 5a).

High or long overfeed changes may affect the winding tension and the quality of the wound package. SSM offers an optional regulation of the take-up tension to ensure a perfect package build-up.

Knitted samples using *fancyflex* VARIO 3 colors with and without intermingling option

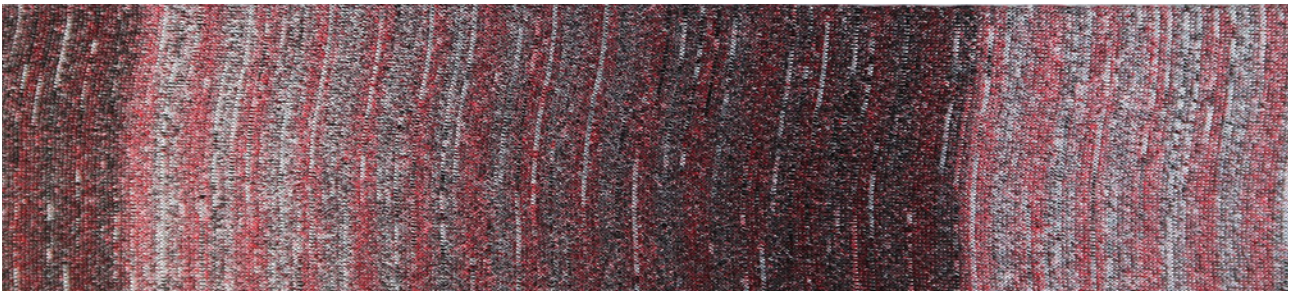


Fig. 5a: Sample using *fancyflex* VARIO 3 colors with intermingling option



Fig. 5b: Sample using *fancyflex* VARIO 3 colors without intermingling option

A straightforward and sustainable process

Compared to the process of creating fancy effects in twisting and spinning, the *fancyflex* approach is simpler and has a production speed up to 20 or 30 times faster. In color-changing effect, *fancyflex* VARIO is comparable to space dyeing, but the fancy air covering is a straightforward one-step process, which does not require any additional investment beyond the SSM air covering machine. In contrast, space dyeing is an individual package process that requires soft dye winding preparation of small dye packages. The packages are dyed with needles injecting the color, then steamed, washed, and rewound, requiring considerably more investment, time and effort.

In terms of sustainability, fancy air covering offers further advantages, with lower machine investments, labor costs, and fewer ecological aspects related to the amount of dyes used, as well as the treatment of wastewater. Using dope-dyed yarns as a supply for the air covering process has the additional advantage of being a straightforward and sustainable process without the use of hazardous chemicals.

Cost benefits with greater control and flexibility

There are also cost benefits. For example, the conversion cost for an air covered fancy yarn is close to 0.22 USD/kg – about ten times less than the conversion cost for space dyeing – both calculated for a PES DTY 150 denier produced in China.

The *fancyflex* color change effects offer more reliable products and quality consistency. *fancyflex* delivers full control over the entire yarn length in the whole package. The length of space dye effects, on the other hand, depends on the distance between the yarn and the tube.

The flexibility of the XENO-AC machine, featuring an individual spindle set up, is perfect for small lot production of fancy yarns. Furthermore, it can be operated as a standard air covering machine, offering benefits for other production runs.

The XENO-AC, combined with the *fancyflex* options, empowers mills to enter a new era of yarn design and stand out from the competition with highly distinguished and innovative products. It positively impacts the profitability with lower conversion costs to help customers stay at the top of their games.

Graf Carding Boosts Recycled Yarn Quality

New recycling card clothing packages to unlock the potential of yarn manufacturing

Fashion made from recycled clothing is in huge demand, but quality presents a major challenge. Graf now offers three dedicated, innovative card clothing packages specially designed for processing mechanically recycled fibers. These sets enable spinning mills to transform recycled cotton, cotton blends and man-made fibers into high-value yarn up to Ne 20. This not only opens up a lucrative new market but also helps to preserve precious resources.



Consumers all around the world want fashion to be more sustainable and recycling garments seems to be the obvious answer. But recycling garments is easier said than done. Compared to virgin fibers, mechanically recycled fibers have a much higher short fiber content, limited elongation possibilities and are more prone to contamination from foreign fibers.

Clever recycling packages ensure dependable high quality

The Graf recycling card clothing packages for regenerated fibers is a game changer, offering card clothing suitable for medium and high production lines.

Graf recycling packages




Package 1*	Package 2*	Package 3*
Regenerated CO	Regenerated CO/MMF	Regenerated MMF
		

Fig. 1: Graf recycling carding packages cover a broad range of applications.
*Graf experts customize each package to match the specific requirements of each customer.

Consisting of licker-in, cylinders, doffer rollers and flats, which are optimally coordinated with each other to provide the highest quality, each set helps to improve raw material utilization and efficiently manage the varying characteristics of different types of recycled fibers.

Graf customers now have three card clothing packages to select from, offering solutions for regenerated man-made fibers (MMF), cotton and cotton blends (Fig. 1). These cover a wide range of applications, enabling mills to produce yarn with adequate and consistent quality that can be used to create the recycled fashion lines consumers want, to the standards they expect.

Transforming trash into treasure

The ability to serve these different types of fibers and achieve yarn counts of up to Ne 20 opens up the capability to make quality fabrics suitable for a wider range of recycled lines. With the market predicted to grow significantly in the near future, this represents a great opportunity for many mills worldwide.

"We find that Graf packages for recycling used clothing into high-quality yarn are an excellent process. We call it 'transforming trash into treasure'. With the help of Graf's technical consultants, it has been easy to implement. There is a growing demand for yarn up to Ne 20 and we think this could prove to be a significant line for us in the future."

Muhammad Mahmoud Nosier
Mill Manager, Alkan Textile in Egypt

An Innovation at the Heart of Rotor Spinning Machines

TQ rotors offer high yarn strength and enhanced spinnability

The TQ rotor is a new member of the ProFiL rotor family, enabling higher rotor speeds while consuming less energy. The improved rotor geometry is designed for optimized yarn values, reduced yarn break rates and easy piecing, improving the overall performance of rotor spinning machines.

Suessen has been an expert in the rotor spinning process for around 60 years and has repeatedly made its mark on rotor spinning with innovative developments such as spinning boxes.

In 2000, Suessen entered the spare parts business with its “Premium Parts” product line, opening up a new area of business. With innovative designs, the automation of spinning boxes and continuous development of high-quality spinning components have enabled the company to push technical capabilities in rotor spinning.

Innovations aiming for optimum customer benefits

Suessen’s development and production of Premium Parts are always focused on optimum customer benefits in terms of product utilization, yarn quality, productivity, energy savings and service life. A major revolution has been the introduction of the ProFiL rotors, which enable higher mechanical and technological rotor speeds, with less energy consumption due to reduced air friction by around 14%. The latest Suessen innovation is another member of the ProFiL rotor family – the TQ rotor.

Modified design matched with proven advantages

The inner geometry of ProFiL rotors is designed for optimized yarn values, reduced yarn breakage rates and easy piecing (Fig. 1). Precise manufacturing and dynamic balancing assure smooth running. The proven 2 µm diamond coating provides optimum fiber alignment and homogeneous fiber slip into the rotor groove. The innovative new TQ rotor introduces a modified groove design, which enables improved yarn strength of up to 0.6 cN/tex and reduces ends down up to 24% (Fig. 2).

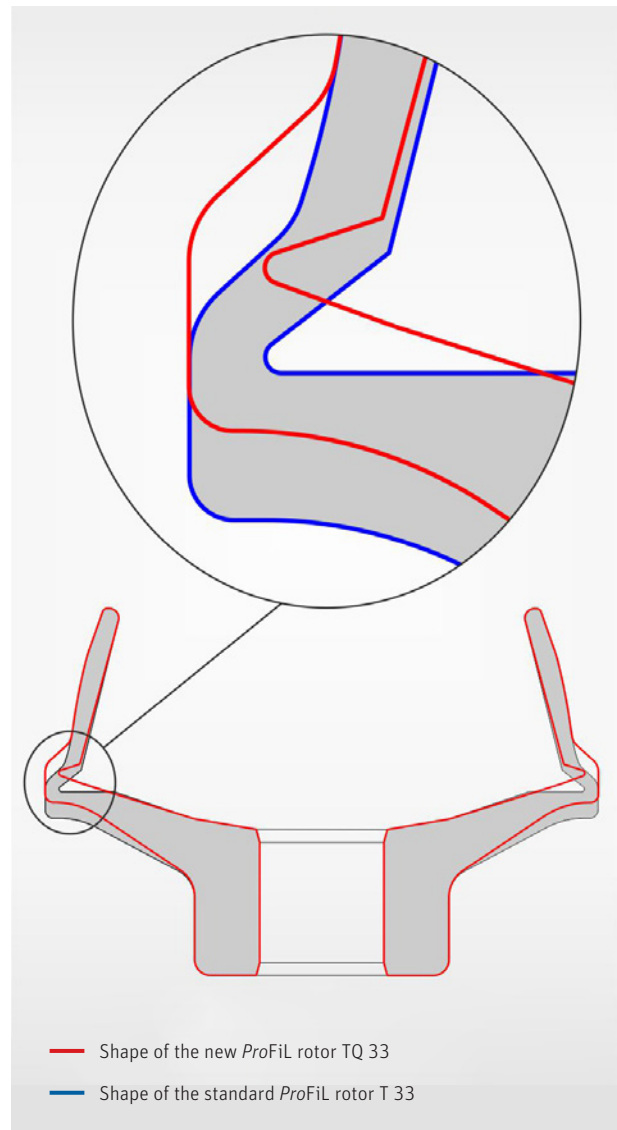


Fig. 1: The red line shows the shape of the new ProFiL rotor TQ 33, compared to the shape of the standard ProFiL rotor T 33 (in blue).

Application	Rotor	Ends down/ 1 000 Rh	Tensile strength (cN/tex)	Elongation (%)	Uster CV (%)	Imperfections total
Weaving	T 33	205	11.8	4.8	14.1	170
	TQ 33	155	12.3	4.9	14.1	171
	Benefit	-24%	+0.5	equal	equal	equal
Knitting	T 33	217	9.9	4.2	15.2	180
	TQ 33	204	10.2	4.3	15.3	173
	Benefit	-6%	+0.3	equal	equal	equal

Fig. 2: The table shows the average results of twelve different field tests carried out with yarn counts from Ne 18 to Ne 30.

With TQ rotors, customers also profit from the proven benefits of the *ProFiL* rotors, which include:

- Less energy consumption, due to a 14% reduction in air-friction
- Extended service life of brake-pads, thanks to a lower moment of inertia
- A higher success rate of the piecer carriage, resulting from the improved inner shape of the rotor

Validated for processing 100% cotton yarns, TQ rotors cover all applications with 33 and 34 mm diameter T-groove rotors. They have been specially designed for Schlafhorst Autocoro spinning machines with spinning boxes SE 9 to SE 12, SC-M and SQ9.

There are two rotor versions currently available: the TQ 933 BD with hybrid bearing and the TQ M33 BD with a magnetic bearing. Further designs are under development, which will bring TQ rotor advantages to other rotor diameters and groove designs.

From parts to complete solutions

There is more to Suessen Premium Parts than just spare parts. Partial modernization packages, upgrades for rotor spinning machines and innovative solutions are also available, enabling constant homogeneous yarn quality, maximum productivity, and energy savings.

Premium Parts cover the entire range of original components at the heart of a rotor spinning machine, the spinning boxes. It is this heart in tip-top shape that allows the greatest performance.

Reimagining Texturing Discs

Temco CoolFlow discs offer longer lifetime and lower process costs

The new geometry and latest Polyurethane (PU) technology in Temco CoolFlow texturing discs generate a disc surface that operates on a lower temperature, resulting in slower ageing and abrasion. This new disc generation delivers more stable yarn quality, longer lifetime, higher productivity and overall process cost reduction. Tests conducted at the Germany's Institute of Textile and Fiber Research confirmed improved heat transfer.

In texturing, friction discs are one of the key components for successful and profitable synthetic fiber production. By careful design of the PU disc, optimizing yarn path geometry and maintaining tight tolerances in manufacturing and quality control, Temco has created a new generation of texturing discs, the Temco CoolFlow discs (Fig. 1).

Clothing and home textile industries use texturing discs to give flat synthetic yarns a structure that resembles patterns found in nature. Temco CoolFlow discs result from unique PU raw material and production methods to provide the highest resistance against wear and spin finish, giving customers a better quality finish with a higher return on investment.

CoolFlow discs meet the highest quality requirements for textured yarns at high texturing speeds, such as twist degree and stability, yarn tensile strength, yarn volume and elasticity, as well as low process and machine downtime. In the case of high twist insertion, the friction between the yarn and the disc surface is a very important parameter for achieving the level and consistency in torque required for high twist insertion rates. Temco PU texturing discs meet these friction requirements and consistently handle the yarn with care during the twist insertion process. This improves the quality of the textured yarn compared to yarns processed with alternative hard disc materials.

The German Institute confirms improved heat transfer

Textile machine engineering often involves highly stressed components that must constantly respond to increasing demands on productivity and properties. Airflow between the discs, which rotate at more than 10 000 rpm, also dictates the resulting temperature load on the contacting filament yarn.

Numerical simulation is an important tool for process and product optimization. This is set up at the German Institute of



Fig. 1: The newly developed friction discs CoolFlow deliver a longer running time and reduce process costs.

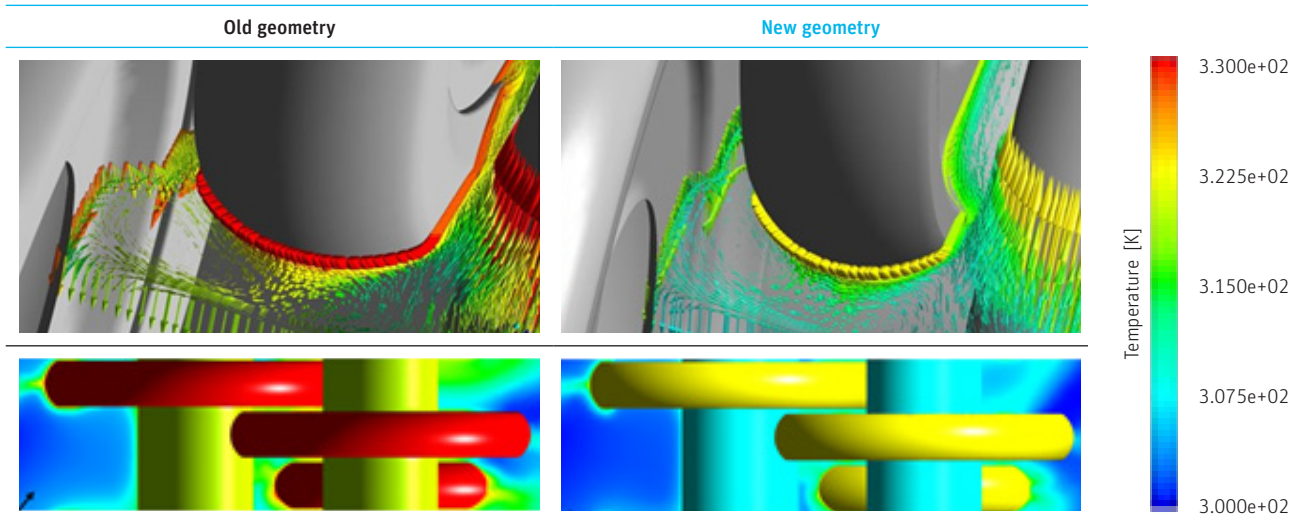


Fig. 2 (up) and 3 (down): The optimized airflow improves the heat transfer, resulting in lower disc temperature. The new geometry of the CoolFlow discs generates a cooler disc surface (source DITF).

Output [ton]	Production output tons/day	Production output tons/month	Production output [ton] equivalent to lifetime of standart discs (25 months)	Production output [ton] equivalent to lifetime of Cool Flow discs (28 months)	Difference	Gain in %
One machine (with 288 positions)	2.84 t	85 t	2 128 t	2 380 t	252 t	10.6%
Turnover in USD	4 260 USD	127 500 USD	3 192 000 USD	3 570 000 USD	378 000 USD	

Fig. 4: Price calculation standard disc versus CoolFlow disc. Yarn production: PES DTY 76 dtex f36 900, yarn speed: 900 m/min, disc combination: 1/5/K, current course price of DTY75/36: 1.50 USD/kg

Textile and Fiber Research (DITF) where the latest hardware, software and testing technology are available for publicly funded research projects. The DITF carried out simulations of the texturing process and demonstrated the airflow between the discs (Fig. 2). The new geometric structure of the Temco CoolFlow discs showed improved heat transfer efficiency, which in turn results in lower disc temperatures (Fig. 3), longer product life cycles and process cost reduction. Field tests (Fig. 4) confirm that CoolFlow discs can be used up to three months longer than standard discs, resulting in increased production and higher profitability.

Better sustainability through higher productivity

Lateral grinding gives the discs improved geometrical stability, higher precision and optimal performance. The improved dimensional accuracy results in a better axial run-out of the disc and therefore a more stable process and a lower constant machine CV value during the whole lifetime (Fig. 5).

PU disc	T1	T2	K value	T2 CV%
Temco CoolFlow discs	55.79	44.87	0.867	2.18
Temco PU discs	55.41	43.0	0.776	2.46

Fig. 5: The CoolFlow discs contribute to lower CV values and thus, better yarn quality.

The latest production and quality assurance methods used in manufacturing at Temco ensure consistent concentricity of the discs at maximum speeds. The disc profiles, surface characteristics and spin finish resistance undergo careful inspection. This provides customers with a highly stable texturing process at the highest speeds that can achieve higher bulk with excellent yarn elongation properties.

CoolFlow is the latest in a long line of world-class developments to come from Temco Research and Development facility, unlocking real cost reductions.

Flexible Aprons for Increased Performance

The new Accotex apron NO-79201 shows higher performance and flexibility

The Accotex apron NO-79201 is made from new compounds that deliver longer life and better performance. Flexible enough to work with all fiber types across ring and compact-spinning machines, field trials show better resistance throughout a 12-month spinning cycle. The NO-79201 is available in a wide range of dimensions as top and bottom aprons for all kind of applications.

Accotex has launched the Accotex NO-79201 (Fig. 1), a new generation of aprons for ring and compact-spinning machines designed to meet the increasing requirements of today's market. Unique recipes and the latest mixing technology ensure that the company produces compounds with the highest quality and outstanding properties. The two aligned rubber compounds in the new Accotex NO-79201 deliver a high abrasion and crack resistant spinning apron. The mechanical robustness of the rubber compound allows effective use on all ring and compact-spinning machines, working with all fiber types and within the whole spectrum of yarn counts.

The excellent elasticity of the compounds provides optimized guidance and control of the fibers, as well as close movement on the turning points in the drafting system. The highly improved wear and crack resistance ensures longevity in any application. Furthermore, excellent friction properties contribute to a smooth and even running over the whole service life of the apron, especially at the start-up of machines.

Superior friction behavior

The new Accotex NO-79201 was tested for 12 months at a customer in the USA, alongside the NO-78210GX, the NO-78210G and a competitor's apron (Fig. 2). The friction value of the different aprons was measured over the whole apron life in regular frequencies. Each column reflects the individual friction value of the inner layer evaluated on representative apron samples from the field test at 3, 6, 9 and 12 months.



Fig. 1: Accotex NO-79201 is available in a wide range of dimensions as top and bottom apron for all kinds of applications.

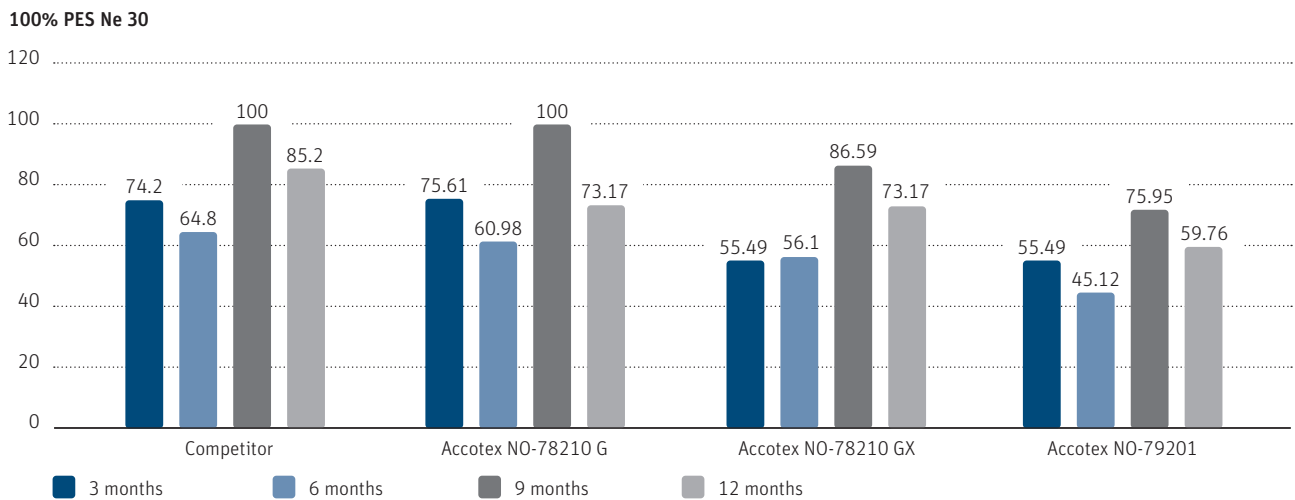


Fig. 2: The new apron NO-79201 shows nearly unchanged inner layer friction, confirming unmatched performance over time.

After 12 months running, the inner layer friction of the new NO-79201 is nearly unchanged, confirming unmatched performance over time.

This superior friction behavior has also been reported from other Accotex customers across the world, processing different fiber types, blends and yarn counts. Besides, these trial customers have noticed far fewer broken bottom aprons than they would normally expect.

Efficient even in demanding environment

The NO-79201 can be supplied with a plain inside or a specially configured inner layer pattern, known as a knurled version (Fig 3). The main benefit of the knurled apron is to provide less contact area to the nose bar, which enables lower torque, and thus less stress on the bottom roller bearings. This also allows the inside structured apron to run clean on so-called "dirty" fibers and to work efficiently in demanding environmental conditions in terms of fiber cleanliness. The knurled apron is a qualified bottom apron for very long ring and compact-spinning machines.

Different versions for flexible use

The Accotex apron NO-79201 is available in a wide range of dimensions as top and bottom aprons for all kind of applications. The knurled apron version is available with inner diameters of 72.5, 76.3 and 79.0 mm. In addition, the

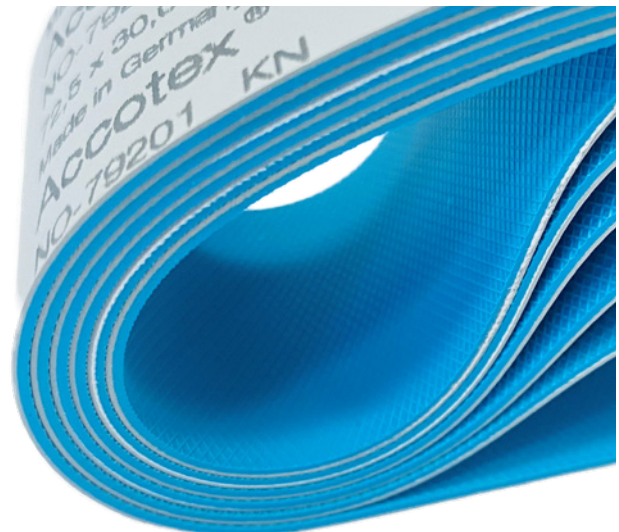


Fig. 3: Accotex NO-79201 can also be supplied with a knurled inner layer, for increased service life.

NO-79201 range is available as closed apron, skived bottom apron and skived and pre-glued bottom apron.

Overall, the new Accotex NO-79201 spinning apron provides improved performance for ring and compact-spinning with less machine downtime. Its flexible application may also reduce stocking levels and simplify servicing regimes.

Precisely Centered Spinning Rings Influence Hairiness

Bräcker ensures reliable results without deviations

Perfectly centered spinning rings are a decisive factor for the hairiness of yarn, but optimum centering can only be achieved if spinning rings are manufactured to the highest quality standards. Bräcker offers first-class rings – as well as a ring centering device – for optimal centering results on ring spinning machines.

While dictionaries simply define “hairiness” as “the quality of having a lot of hair”, the degree and characteristics of hairiness is actually an important parameter in the textile industry – both in compact spinning and ring spinning. Hairiness describes non-embedded fiber ends and loops that protrude from the yarn body. Depending on the downstream application and final product, hairiness can be a good or bad thing. For example, hairiness may be needed for thermal insulation, or to give the yarn product a fluffy appearance. However, if clean operation is required, hairiness becomes a challenge because the fiber ends often break and fall off the hairy yarns due to abrasion.¹

Defining the hairiness index

Various devices define hairiness, either in numbers related to a certain distance from the yarn body, or by the integral principle. The latter uses a monochrome light source shining on the protruding hairs of the yarn body and evaluates the scattered light of all fiber ends and loops as a dimensionless number. The hairiness index is calculated with the following formula²:

$$\text{Hairiness Index} = \frac{\text{Total length of protruding fibers (in cm)}}{\text{Total length of yarn tested (in cm)}}$$

Consistent hairiness as a sign of quality

No deviations are welcome in yarn production and the hairiness should be identical from one spindle to another. The slightest deviation may result in a diffuse fabric appearance. Consistent hairiness is a relevant quality characteristic that not only influences costs but is also essential for downstream processes such as weaving, knitting or dyeing. Reducing any variation between the individual spinning positions to a minimum is therefore of utmost importance.

How hairiness is influenced and controlled

Suboptimal centering of the spinning rings on the spinning frame can cause considerable variation on the hairiness parameter – both with conventional ring-spun yarn and with yarns produced with compacting systems. Therefore, it is essential to perfectly center the rings of all spinning positions along a ring spinning frame. For rings to be centered optimally, they need to be produced to the highest quality standards, with the tightest tolerances for evenness, roundness and concentricity. Bräcker ensures that all rings produced always meet the highest quality requirements.



Fig. 1: Bräcker spinning rings guarantee highest quality regarding roundness, evenness and concentricity.

Precision like no other

Bräcker provides a compact and easy-to-use ring centering device that is placed over each spindle and indicates the optimal positioning in a crosshair with the highest precision (Fig. 2).

With the ring centering device in place, the spinning geometry is significantly improved at each spinning position. This not only positively influences the hairiness, but also the tension fluctuations in the ring traveler system, which means less traveler wear and tear.

¹ «ScienceDirect» <https://www.sciencedirect.com/topics/engineering/hairiness>

² <https://de.slideshare.net/SunilKumarSharma14/hairiness>



Fig. 2: Bräcker ring centering device, with the crosshair indicating the optimal ring positioning

A proven solution

In a test series, Bräcker evaluated the influence of the rings on yarn hairiness. Cotton yarn Ne 30 was conventionally spun with varying ring centers (measured with the Bräcker ring centering device). Yarn quality was tested with the Hair-

Conventional ring yarn, Ne 30, traveller C 1 MM udr, ISO 35.5

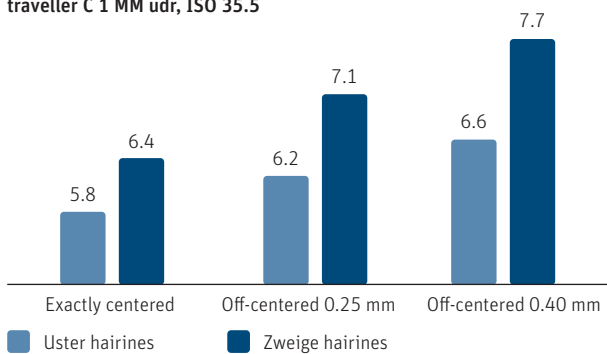


Fig. 3: Precise centering of the rings is key to achieve the best hairiness results

iness UT4 and Zweige, the Yarn irregularity UT4 and the Tensile strength Tensojet.

No deviations were found in the IPI values and only minor deviations were observed in irregularity, tensile strength and elongation. Hairiness, however, showed immense deterioration due to insufficient centering of the rings (measured with both hairiness instruments).

The diagram (Fig. 3) shows a clear correlation between the hairiness and the degree of centering. If the ring center deviates from a set center by only about 0.4 mm, the hairiness value significantly deteriorates by 0.8 to 1.3 points.

In summary, insufficient centering of the spinning rings negatively influences the hairiness value of the spun yarn, depending on the degree of decentering. Bräcker offers the ring centering device to precisely center rings and achieve optimal and constant hairiness parameters.

Ensuring Competitiveness through Spindle Expertise

How to choose the right spindle for production success

Whether the goal is higher productivity, more consistent yarn quality, energy savings or improving the work environment in the spinning mill, choosing the optimal spindle is key. Novibra's wide range of spindles, supported by decades of experience, helps customers to find the perfect product for each application.

Several factors influence the decision for a spindle type. The yarn count that needs to be spun and the spindle speed are perhaps foremost. Energy savings and improving working conditions are also common goals.

The following list provides a useful guide when considering the ideal Novibra spindle (Fig. 1) for each application.

First spindle running at 30 000 rpm – NASA HPS 68

Premium spinning machine manufacturers such as Rieter, Toyota or top-class producers from China opt for Novibra's flagship and best-seller: NASA (Noise Absorbing System As-sembly), which offers extended service periods, maximum durability, and noise reduction.

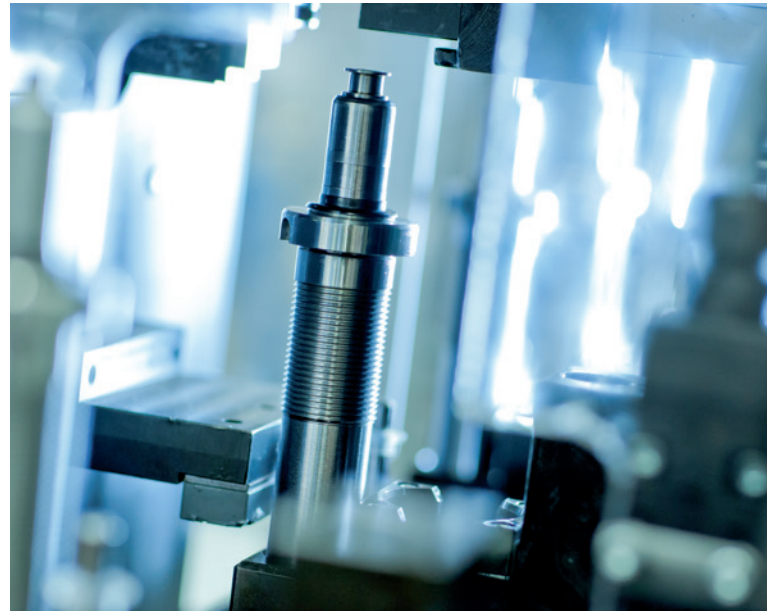


Fig. 2: NASA HPS 68 on production line – the first spindle running at 30 000 rpm



Fig. 1: Novibra's wide range of spindles – the perfect product for each application

Installations in the optimal range for NASA HPS 68 (Fig. 2) – at yarn counts Ne 20 and finer and 20 000 to 30 000 rpm speed – represent a completely different type of load on the spindle than coarse yarn count applications. Smaller repeated loads at high frequency occur, causing micro vibrations. Therefore, NASA features a second damping system in the form of a chamber filled with lifetime grease. A further benefit is noise reduction, significantly improving the working environment in a spinning mill (Fig 3).



Fig. 3: With NASA HPS 68, customers benefit from extended service periods, maximum durability, and noise reduction.

Reliable solution for medium and fine yarn counts – HPS 68

If the aim is to spin medium and fine yarn counts, at maximum speeds of 20 000 rpm, the HPS 68 is the right choice. It may also help with saving energy and extending the longevity of each spindle in operation.

The HPS 68 can surely run at higher speeds, however 20 000 rpm is a sweet spot in terms of noise level and long lifetime requirements.

Novibra's second best-selling spindle, HPS 68, has pioneered the switch from conical types to spindles with a flat tip. This spindle also makes operators' lives easier, with low maintenance, simple cleaning practice and substantially longer oil exchange periods.

The spindle of choice for coarse yarn counts – L HPS 68

When spinning coarse yarn counts the L HPS 68 is the spindle par excellence. Speed increases up to 20 000 rpm are possible, however, the speed is limited by the desired yarn count and twist.

A full cop and high tension of the yarn puts a heavy load on the spindle neck bearing – which is increased by further imbalances in the spinning process, the weight of the traveller, or the yarn hairiness. L HPS 68 features special design elements to absorb such loads and ensure the desired harder damping.

Coarse yarn count spinners benefit from the 18.5 mm wharve diameter, unique in this segment, ensuring optimal load on machine driving elements and ideal energy consumption.

High speed and energy saving – LENA

For spinning yarn counts of Ne 30 and finer, with tube lengths up to 210 mm and speeds up to 30 000 rpm, LENA (Low-Energy and Noise-Absorbing) is the optimal spindle. The latest addition to the Novibra spindle family, LENA was designed to achieve the highest speeds with lower energy consumption and reduced noise.

Thanks to the uniquely small wharve diameter of 17.5 mm, LENA contributes between 4 to 6% energy savings, helping to increase competitiveness, while responding to the demand for sustainability and climate awareness.

Deciding which one is right for each application

There are endless discussions about a universal spindle type. However, only optimally selected spindles give the best results. Yarn count, speed, lifetime, maintenance requirements or energy consumption must be considered in the selection process. Novibra sales teams are always happy to assist in choosing the right product for each application.

Leverage Carding Maintenance to Boost Productivity

Flexible service packages and extended service station footprint

Significant cost savings, as well as consistent, homogeneous and reproducible product quality, can all be achieved through timely maintenance of card clothing. Graf's new range of flexible service packages with extended global support ensures customers can keep their production performing at the highest level for longer.

Graf, the card clothing specialist, highly recommends customers meet the recommended service intervals for their card clothing components. This not only increases the product lifetime; it can also deliver significant production cost savings, as well as ensure the consistent, homogeneous, and reproducible product quality customers need.



Fig. 1: Graf experts always strive to achieve excellence and give customers a competitive edge.

Graf offers first-rate Swiss-engineered service machines which have been specifically designed to ensure an easy and reliable servicing of Graf components. Therefore, customers can perform service using their own staff or using Graf experts (Fig. 1) so they can focus on their core business.

Four service packages to meet every need

Graf offers four individual service packages, covering a wide range of applications, with always the same goal: extending card component lifetime and reducing machine downtime to a minimum (Fig. 2).

- Package A is designed for re-winding and grinding/activation of the card clothing
- Package B covers the equalizing and grinding of the flats on the card
- Package C includes the flat service in the workshop, with end shoe milling and clipping of the flat bars
- Package D is for the startup, providing all services needed to put the flat card back into operation

Service package solutions	Requirements	Purpose	Customer benefits
Package A: wiring, grinding/activating	GAV	Metallic wire mounting*	Resharpener of all card clothing and readjustments of each tooth back into nearly original condition, leading to a longer product lifetime
	TSG 40 – 60" pneumatic	Traversing grinding device	
	ASG	Doffer grinding device	
	ROD 35, ROD 35/1**	Roller mounting rack	
Package B: flat grinding/equalizing	DSW 40 – 60"	Flat grinding roller	Flat equalizing after 15 t and consistent grinding over the product lifetime, resulting in an optimal carding gap and sharp tooth tips
	DEW 40 – 60"		
Package C: flat clipping/milling/measurement	DAM 25/1	Flat clipping machine	Flat maintenance for a constant and perfect inshape and newly clipped flat sets, ensuring consistent quality
	DSM 20/1	Flat grinding machine	
	DKF 10	Flat end milling machine	
	ESM 150	Easy shoe milling machine	
Package D: startup	Service technician	Final setting and restart	Smooth card restart and optimum conditions to achieve the desired quality

* incl. DABW, butt welder

** incl. UAV 25

Fig. 2: Individual service packages to answer every customer's specific service requirement.



Fig. 3: Graf deploys its specialists around the world to accompany customers toward success.

Expanding the network of services to Bangladesh, Vietnam and Uzbekistan

Graf is ramping up its local presence with three new service workshops in Bangladesh, Vietnam and Uzbekistan. With a total of 40 service workshops worldwide, Graf brings its expertise to customers' mills (Fig. 3).

Graf servicing in action

The value of Graf services has already been proven by many customers. M. Halil Cetin, Mill Manager of MEM TEKSTIL SAN.VE TIC.A.S entrusts Graf experts with the maintenance of card clothing and sees a clear impact on the overall operation equipment effectiveness.

“We have completely outsourced our card clothing service to Graf agent for Turkey – Sarteks. The unmatched quality of Graf service machines combined with Sarteks’ specialist knowledge and local support allow us to extend the lifetime of our card clothing, achieving the highest yarn quality, while saving money. This win-win situation enables us to focus and invest our time in our core competence, confident that our card clothing is being properly managed at all times.”

Becoming the Amazon of Yarns

How TURKTEX responds in no time to customers' demands and offers over 1 000 different yarns

In the fast-paced market of synthetic yarns, answering the ever-increasing customers' demands in a timely manner is a crucial competitive advantage. Since 2002, the synthetic yarn manufacturer TURKTEX has excelled at finding newer, better, and faster ways to satisfy its customers' demands, almost in no time. With SSM DP5-T, TURKTEX takes its competitiveness and mission towards customers to the next level.



Fig. 1: With SSM DP5-T, TURKTEX provide high quality Air Textured Yarn (ATY).

The independent Turkish textile company, TURKTEX, focuses on the world of synthetic yarns, and is a brand of Turkuaz Tekstil San. ve Tic. A.Ş. group. Founded in 2002, in Bursa, Turkey's textile hub, TURKTEX has relied on SSM texturing machines from the very beginning, enabling the company to respond to customers' demands with innovative, fast and flexible solutions.

Due to its superior products, TURKTEX is now Turkey's leading company in the high value-added continuous filament sector, especially for polyester (PES) and polypropylene (PP) yarns. Its production portfolio includes yarns for home textiles (such as curtains, upholstery, mattress ticking and carpets), fashion, automotive fabrics as well as yarns for technical applications, outdoor and military. Besides supplying the local market, the company exports its products to more than 30 countries.

The largest portfolio to meet customers' demands at any time

TURKTEX has the ambition to become the Amazon of yarns, that is the biggest synthetic yarn retailer. With a huge portfolio including polypropylene (PP) or polyester (PES) in divergent forms (recycled, flame retardant and more), various final yarn counts up to 2 000 denier, each available in 50 different colors, the company is on track to succeed.

DP5-T: the right solution to handle large assortments

In order to provide its huge range of yarns with short lead times, TURKTEX is dependent on reliable, fast, flexible and easy-to-use machines that are also quick and simple to maintain.

SSM machines have proved to be the perfect solution. In 2020, TURKTEX acquired the last SSM texturing machine DP5-T to help the company meet the demand in Air Textured Yarn (ATY) made of PES and PP (Fig. 1). It then invested in a DP5-FT false twist-texturing machine to drive business in the Drawn Texturized Yarn (DTY) market as well.

Today, the company stores approximately 1 000 different recipes in its SSM DP5-T machines and changes around every other second day the settings of the spindles. Any recipe can be removed and put back into production without any quality or repeatability issues. With its individual drive con-

cept, the DP5-T makes it easy to switch between recipes, an indispensable feature for TURKTEX as it responds to the ever-changing needs of its markets.

TURKTEX is very satisfied with SSM's support, service and technicians. Plant Manager, Mr. Ömer Efendioğlu (Fig 2.), highlights: *"SSM cares about our needs and supports us from the first negotiation to the commissioning of the machine and beyond."*

Flexibility, fast response and excellent quality

TURKTEX has a strong internal textile research and development department which ensures innovative products. To make these products a reality in the desired quality, the company can count on SSM. Mr. Dündar Cetin (Fig. 3), owner and



Fig. 2: Mr. Ömer Efendioğlu, plant manager at TURKTEX, is very satisfied with the great support from SSM.



Fig. 3: Mr. Dündar Cetin, owner of TURKTEX, appreciates working with a company who shares the same values and is dedicated to delighting its customers.

technical director of TURKTEX, is convinced that it is crucial to satisfy customers' requirements immediately and without delay. He states: *"Always keeping promises and ensuring excellent quality is possible for us, thanks to SSM DP5-T."*

Flexibility is another critical factor. While standard batches in the industry are usually over 2 tons, TURKTEX handles many small orders, as low as 50 kg. Changing raw material and parameters can be laborious, but with the DP5-T, it is easy for operators to switch between orders.

In summary, Mr. Cetin says: *"I am really very happy about the cooperation with SSM because we follow the same values with our identical slogan: Flexible, Fast, Safe."*

Convincing Results with COMPACTeasy at Arvind

Compacting system increases production by 10%

With compact yarns becoming the standard for shirts and trousers, Arvind Dyeing & Bleaching in India was keen to see improvements in their production output. In a trial series with Suessen's COMPACTeasy, Arvind was able to increase production by 10%. The compacting device reached performance levels close to ones obtained with a pneumatic system, without any additional energy consumption. The customer was impressed with COMPACTeasy's user-friendliness and reached the desired production level only 3 days after installation of the device.

As one of three divisions of the Marda Group in India, Arvind Dyeing & Bleaching was founded in 1982 and ventured

into spinning in 2012. The company, known as "Arvind," is managed and guided by third generation family members, Director Mr. Gopal Bhikulal Marda and General Manager Mr. Janardan B. Patil.

Arvind operates almost 45 000 ring spindles to produce around 17 tons of yarn in three shifts every day. Today, each machine runs with Suessen EliTe and the latest mechanical compact-spinning system COMPACTeasy (Fig. 1).

Keeping up the trend with proven solutions

Arvind produces carded and combed weaving yarn in the range of Ne 30 to 120, as well as rotor yarns, mainly in the coarser count range. Most of the yarns are used in their own

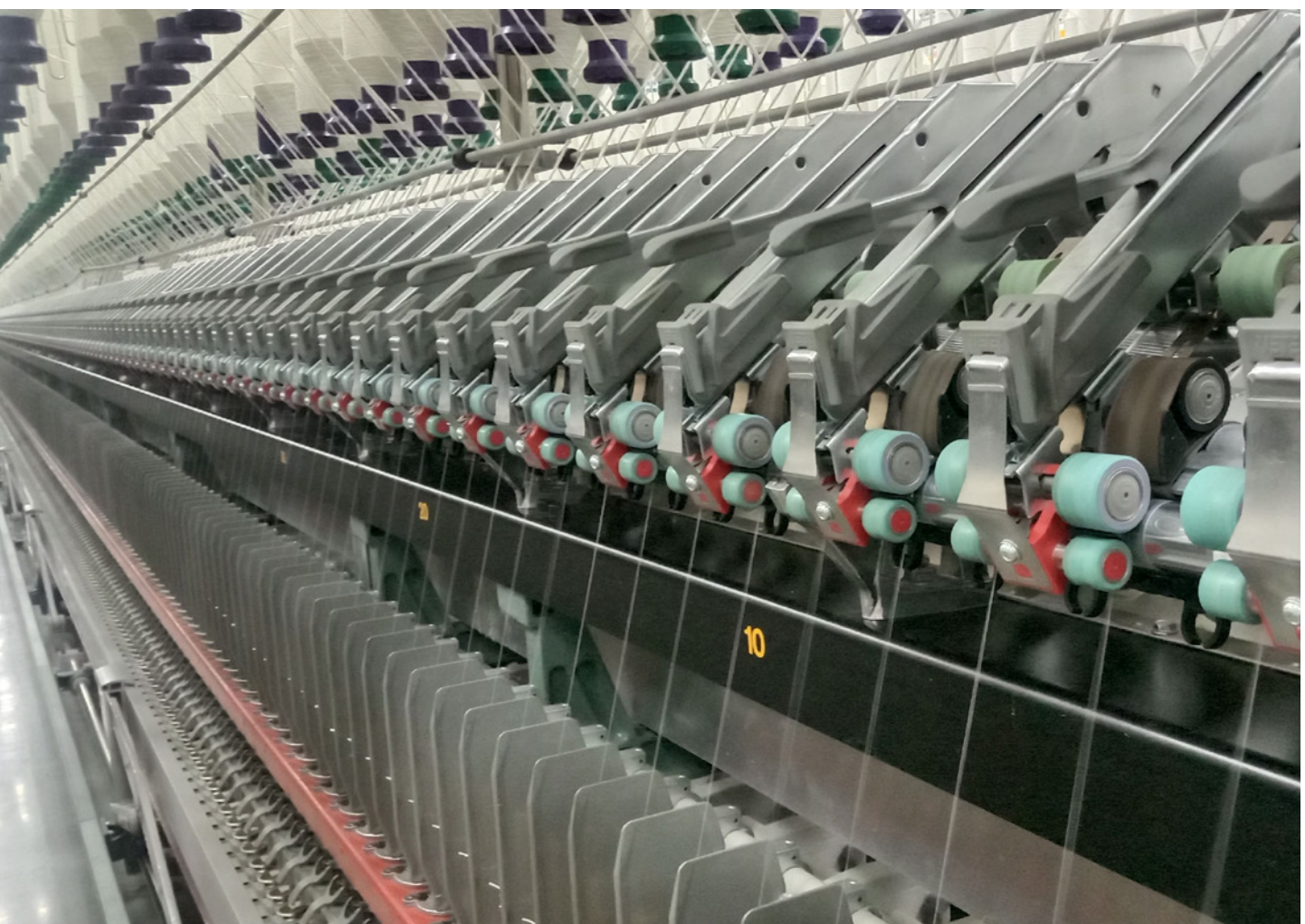


Fig. 1: Almost 45 000 ring spindles equipped with Suessen EliTe and the latest mechanical compacting system COMPACTeasy, delivering outstanding results.

weaving, to produce 40 000 meters of fabric every day – such as poplin, cambric, bottom weights, and Lycra fabrics that are exported internationally.

Responding to the growing demand for compact yarns, which has become the standard in shirts and trousers, Arvind was very interested in quickly optimizing its production. A trial series proved that Suessen’s compact yarn offered many advantages for their weaving – the customer use it both in the weft and in the warp. Mr. Janardan Patil (Fig. 2) explains: “Compact yarn leads to a better appearance of the final product and increases the loom efficiency by around 5%”.

Delivering on promises

Arvind is driven by innovation and is always open to new opportunities to boost its competitiveness. The company was eager to test COMPACTeasy, which is promising cost optimization in compact spinning. After one day and a half of installation, the first trial on one of its Rieter ring spinning machines G 32 with 1 632 spindles delivered remarkable results, close to results with a pneumatic compacting system, but with no additional energy consumption.

Results in detail:

Ne 41’s combed 100% cotton for weaving, with a spindle speed of average 21 500 rpm: COMPACTeasy significantly reduced the twist from 27.3 to 2.5 TPI only.

	Conventional ring spinning	Pneumatic compacting	COMPACTeasy
CSP	2 882	3 140	3 163
IPI (-50%/+50%/+200%)	110	69	76
Hairiness	3.5	2.6	2.7

Ne 32’s carded 100% cotton for weaving, with an average spindle speed of 19 800 rpm and a TPI of 23.8.

	Conventional ring spinning	Pneumatic compacting	COMPACTeasy
CSP	2 690	2 780	2 730
IPI (-50%/+50%/+200%)	1 134	690	766
Hairiness	3.5	2.7	2.7

“Compact yarn leads to a better appearance of the final product and increases the loom efficiency by around 5%”.



Janardan B. Patil
General Manager, Arvind

Only three days after the installation of COMPACTeasy, Arvind saw a production increase of 10% in spinning and a very consistent quality level, with lower hairiness and a higher yarn tenacity (CSP). Furthermore, the customer achieved power savings of around 0.2 to 0.3 unit consumed per kilogram of yarn (UKG). This coupled with the low investment, the fast plug on and plug off feature, and the continuous support of Suessen which allowed the machines to run at speeds above 20 000 1/min convinced Arvind who ordered COMPACTeasy sets for 14 machines. The smooth deployment of these sets with minimal disruption persuaded Arvind to place a follow-up order additional sets for the 5 remaining machines.

Mr. Patil emphasized that COMPACTeasy allowed a significant increase in productivity. In addition, spare parts consumption is much lower and the performance in downstream applications has been at least as good as with compacting systems with suction.

Further collaborations are now in the pipeline, aimed at helping Arvind and the entire Marda Group to take their profitability to the next level.

Explore our Virtual World to find out how we are improving the attractiveness of our ring and compact-spinning systems to strengthen your competitiveness.



virtualworld.rieter.com



Accotex

Bräcker

Graf

Novibra

SSM

Suessen

TEMCO