COREflex® – Core Yarn Attachment for Ring Spinning Machines

ACP Quality Package

Premium Parts – News

HP-GX 5010

New Top Weighting Arms

Mill Reports:

– Nahar, India
– Danmao, China

Berkol – Part of Bräcker
Wilhelm Stahlecker GmbH
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Spindelfabrik Suessen GmbH
Front Cover: EliCoreTwist® – EliTwist® CompactSet with COREflex®
Dear Readers,

When we wrote the editorial for the previous issue of our SPINNOVATION, sometime before ITMA 2007 in Munich, our industry was going strong, and it appeared it would continue like this for a long time. There were a few faint signs of an upcoming downturn, but many ignored them.

By now unfortunately it has become clear that we are in the middle of a recession of the textile industry.

Like all recessions, this one will come to an end, too. If history is any guide, the present recession should not last too long, because it is so severe.

For a manufacturer of Technology Components research is one tool for survival. Also in an adverse economic environment, we must continue to do research and development. To demonstrate our continuing commitment, this issue contains an article about WST, the Research and Development Center for SUESSEN. Many of you have visited WST already, and can easily relate to the article, all others are cordially invited to visit WST.

R&D is useless, at most an academic exercise, if one does not have the manufacturing capabilities to covert the engineering ideas into sellable and useable hardware of the highest and most consistent quality. You will find a report about some of our manufacturing processes. We hope you will find this interesting, even if it is quite different from your kind of manufacturing.

The famous inventor Edison has said, that invention is 10% inspiration and 90% perspiration! This is certainly true in our field. We are proud to introduce to you two of our recent developments.

The addition of the HP-GX 5010 for worsted spinning now makes our family of top weighting arms complete. As with its ‘relatives’ the HP-GX 3010 / 4010, a good amount of testing (“perspiration”) was done, before we felt it should be offered to our customers.

Another outcome of much inspiration and perspiration is our ACP Quality Package. Numerous field tests have shown quality improvements, which are at times astounding. While a simple device at a first glance, we learned, that everything must be just right dimensionally for this to give the desired results.

Open End Spinning Technology is an important part of SUESSEN’s business. We are proud to present to you some further improvements in our line of Premium Parts.

A famous British physicist said at the end of the 19th century, when he advised a young man not to study physics that “all major discoveries in physics have been made, all that is left is to fill a few minor gaps” Little did he know about the Theory of Relativity and about Quantum Physics, which would revolutionize physics in less than 25 years after his dictum!

Sometimes people feel similar about our industry—and they are just as mistaken! Who would have thought about Compact Spinning 15 years ago, who would have thought about ACP, who would have thought about the CR coating for opening rollers …

All of our efforts will bear no fruit, if you, our customer are not satisfied with the "Package SUESSEN".

A good while ago we conducted Customer Satisfaction Survey and we have a summary report of the results. Broadly speaking, it told us that we are on the right track, but still have room for improvement. We would welcome your comments.

A highlight of every issue of our SPINNOVATION is the mill reports. Also in this issue, we are fortunate to present to you two reports. We are grateful to our customers, who agree to share their experience with our products.

Most of our customers stated, that the ITMA 2007 in Munich was a success. The show continues, so to speak and this year, there will be two major textile shows:
The ITMA Asia in Shanghai will surely attract very large crowds from China and elsewhere. Of course, we will be there, and we request you to visit us on our booth D 02-06 in hall W3.

A few months later, there will be the ITME India in Bangalore. While the event is well established, the venue is new, and we are eager to find out how Bangalore—this striving city in India—will handle this event. SUESSEN of course will be present and we request your visit on our booth.

This year is a milestone for SUESSEN: In 1998, just ten years ago, we delivered the first EliTe® Compact Spinning Systems to the Austrian customer Linz Textil. Thanks to him, and thanks to all of you we are now the leader in compact spinning technology with more than 2,800,000 EliTe® and EliTwist® Spinning Positions running in the world. This might be a reason to celebrate, but much more it is a reason to strive even harder to continue to earn your trust!

We hope, you will enjoy this 24th issue of our SPINNOVATION, and as usual, we welcome your comments on the articles.

Erich Casanova, Managing Director
Peter Stahlecker, Managing Director

SUESSEN’s Vision

– Be the global Technology Component and Conversion Supplier to the yarn manufacturing industries in ring spinning and open-end rotor spinning
– Create added value for our customers through reliability, productivity and quality
– Ensure a sustainable and profitable growth
For many years now, SUESSEN has been working successfully on core-yarn attachments for ring spinning machines.

With the development of the EliTe® Compact Spinning System SUESSEN designed the optional core-yarn solutions EliCore® and EliCoreTwist®. Following the aggregated experiences of our customers and our technologists our engineers redesigned the system.

COREflex® is a reliable and cost-effective solution and meets all requirements of any quality spinner be it in the conventional and/or compact ring spinning department.

The new design follows stringently the “Requirement Specifications” provided by our customers:

1. Designed to fit in their many different types of ring spinning machine irrespective of the top weighting arm used
2. For conventional and compact ring spinning
3. Parking position for filament packages
4. Feed roller adjustable in 2 planes in regard to yarn path
5. Roving and filament guided by the same elements installed independently from top weighting arm
6. Traverse motion with friction-free suspension to ensure jerk- and shock-free movement
7. Slowest traverse motion speeds
8. Suitable for long machines up to 1200 spindles
9. 100% congruent movement of roving and filament
10. All required electronic settings to be made at a central position

Fig. 1 EliCoreTwist®—Eli Twist® CompactSet with COREflex®
Description of the Design

1. Unwinding Device

SUESSEN decided for a solution with only one drive roller for the filament cones on each machine side. This provides the necessary independency from any machine design. The prerequisite for this solution is the patented filament cone adapter (Fig. 2).

The filament cones are separated by individual separators, which are the support of the cone adapters and also provide the parking position (Fig. 3).

The pivot position of the filament cones is not centred to the drive rollers – guide pivots of the adapters are always moving against a wear protection imbedded in the separator.

The individual filament cone separators also serve as roving guides.

One frequency-controlled gear motor for each machine side is fitted vertically (space saving) between the creel and the headstock or endstock of the ring spinning machine (Fig. 4). The motor is coupled directly to the drive roller. The inverter of the gear motor usually is installed into the control cabinet of the basic machine.

The draft setting of the filament is continuously variable within the draft range of 1.8 to 4.0 – the setting is made from the central control panel.

2. Traverse Motion

The COREflex® Swing Arms with filament feed roller are mounted on the roving guide rail. This ensures the congruent movement of roving and filament.

The friction-free suspension of the roving guide rail on two plate springs (Fig. 5) is a patented solution and...
guarantees a completely friction-free movement, ensuring a jerk- and shock-free traverse motion of roving and filament at slowest speed.

For the friction-free suspension we use a specially designed bearing slide for the back bottom roller.

There is one individual drive for each machine side, installed in the centre of the machine (Fig. 6).

The high gear ratio of the drives enables stroke time settings freely selectable between 15 minutes and 24 hours per double-stroke – the setting is made from the central control panel.

The lift (stroke) of the traverse motion may be set between 0 and 5 mm.

3. Suspension of Swing Arm and Feed Roller

The suspension of the swing arms and roving guides on the roving guide bars makes the system completely independent from the type of top weighting arm used.

The filament feed roller is supported by plain bearings (patented solution, Fig. 7). It is adjustable to the yarn path in longitudinal and transversal direction and can be set to the closest distance to clamping line.

The filament feed roller does not touch the top roller! Thus a easy visual control of the filament by checking the rotation of the filament feed roller is possible. Anyhow the adaptation of electronic filament control systems (optional) is possible.

For cleaning purposes a cleaning slot in the feed roller prevents scratching on the filament feed roller surface.

4. Electronics

Any setting of tension draft and traverse motion is made at a central control panel (Fig. 8; this panel also
contains the functions for the optional compact spinning applications EliVario and EliVAControl). A magnetic sensor on the front bottom roller detects the reference speed.

The drives of the unwinding devices have a capacity of $2 \times 260\,\text{W} = 520\,\text{Watt}$.

The drives of the traverse motion have a capacity of $2 \times 150\,\text{W} = 300\,\text{Watt}$.

The total rated capacity of COREflex® is 820 Watt, irrespective of the machine length.

**Feeding of the filament is the central issue in the core-yarn production.**

The feeding of the filament into the centre of the fibre strand before twist insertion is the crucial point in the production of core-yarns and most decisive for the final quality (Fig. 9). This becomes more difficult and important the smaller the fibre strand, as it is the case in compact yarn spinning.

False settings result in uncovered lengths of filament (Fig. 10 and 11), and eventually in serious complaints.

**Summary**

COREflex® is the new SUESSEN core-yarn attachment to spin soft core-yarn on any type of ring spinning machine. The attachment works completely independently from the top weighting arm and guarantees simultaneous and jerk-free movement of the traverse motion of fibre strand and filament.

The filament feed roller is independently adjustable in two planes and does not touch the front top roller.

Setting of tension draft and traverse motion for COREflex® is made at a central control panel.
Yarn Quality Improved by ACP Quality Package
Dr. Norbert Brunk, Head of Technics & Engineering RS, Spindelfabrik Suessen GmbH

1. Preliminary Remarks

Today, the well-known 3-roller double-apron drafting systems of ring spinning frames permit to draft rovings up to a total draft of 80 and more under optimum conditions. The task of the break-draft zone is to introduce the sliding process of the fibres of the twisted roving. In the subsequent main zone, the fibre strand is guided between the top and the bottom aprons and drafted to the desired final count of the yarn.

This mode of operation is already very old and has hardly been modified in the last decades.

With the ACP Quality Package by SUESSEN it is now possible, however, to improve the drafting process in the main zone and consequently the values of the most important yarn parameters.

2. The Drafting Process on the Ring Spinning Machine

2.1 The Break-Draft

The purpose of the break-draft zone is to prepare the main draft. The fibres in the roving are stretched and extended up to a degree which allows them to shift in the main zone immediately after leaving the cradle clamping line.

The basic correlation for each individual staple length between the setting of the break-draft zone and of the break-draft of a ring frame drafting system is shown in Fig. 2.

A long break-draft zone with the smallest possible break-draft must definitely be preferred. It reduces very clearly the wear of top roller cots and aprons and the load on the draft gearing, especially in the case of long machines.

In addition, the total system is less prone to climatic modifications, variations in fibre length and fluctuation in the drafting resistance of the roving.
2.2 The Main Draft

As a basic principle, each of the two pairs of rollers in a drafting zone produces a zone of fibre friction by pressure\(^1\). The fibre condensation caused by this pressure does not only have a vertical effect, but spreads from both sides into the formation of fibres (Fig. 3).

Both fields of friction are finally responsible for fibre guidance and the extent of regularity produced by the drafting process. The two fields of friction should not overlap, nor should their spheres of activity be too far apart.

It is beneficial to the draft and degree of regularity achievable, if within a drafting zone the field of friction of the back roller pair reaches as far as possible into the drafting zone to guide the fibres as long as possible. The front field of friction should be short and strong so that only the clamped fibres are drawn out of the fibre strand. This ideal is however restricted by relatively close limits in design as a result of the geometrical conditions.

The high degree of parallelism of the fibres achieved by the preceding steps of drawing, doubling and imparting of twist on the roving frame has in turn the effect that the inter-fibre friction at the cradle clamping line is still high. The drafting force therefore rises considerably at first. It reaches its maximum when the first...
fibres start to move and static friction turns into kinetic friction. This process takes place in the main zone between the two aprons. As soon as all fibres are moving, the drafting force is decreasing again considerably. This condition is reached in the front area of both aprons up to the clamping line of the front roller pair. Inter-fibre friction is very low in this area (Fig. 4).

Fibres are therefore dispersing as a result of the drafting process. Such a thin formation of heavily dispersing fibres can absorb only insufficient pressure from the front roller pair and is therefore unable to produce a sufficiently large field of friction.

The sector in which the inter-fibre friction of the fibre strand is at its minimum, has a length of at least 15 or 20 mm in current drafting system designs (Fig. 5).

This explains why this sector cannot contribute any more considerably to open undrafted bundles of fibres and to guide shorter fibres safely. As a rule, this disadvantage cannot be compensated by even closest cradle spacers and very soft top roller cots.

3. The ACP Quality Package

With an additional point of friction arranged in the sensible sector of the main drafting zone, the aforesaid disadvantages can be eliminated. When the fibre strand, after leaving the double apron guidance, is deflected, the friction field produced by the front roller nipping line is increased and shifted in direction of the cradle opening (Fig. 6). Fibre orientation and extension are improved. Parallel fibres still adhering to each other (fibre packages) can now be shifted relatively to each other even in this sector. Consequently, drafting defects are reduced, and the overall regularity of the drafting process is improved. At the same time, the tendency of the fibre strand to spread is suppressed. Inter-fibre contact is increased, and finally this results in a better utilization of fibre substance and better yarn strength.
Table 1

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<th>Ne</th>
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**EliTwist®**

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**Conventional Ring Yarn**

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By shifting the front field of friction towards the cradle opening, the apron nip can be closer. For this reason, the correct cradle design is important for the interplay with the point of friction. Numerous trials have confirmed again and again that a cradle with flexible leading edge is of advantage in the combination with the bottom apron nose bars offered today, most of which have a steplike design. Such a cradle compensates the practically unavoidable length tolerance of aprons and permits closest apron nips without the dreaded stick-slip movements of the aprons. A vast amount of trials was required to define the correct position of the friction point in relation to the flexible leading edge of the cradle and to translate this solution into technical design (diameter, coefficient of friction of the surface). It had to be ensured in particular that for all yarn counts both fields of friction (Fig. 6) can be shifted as closely as possible towards each other without direct contact.

The result of the optimum combination of both—Active Cradle (AC) with flexible leading edge and an optimally arranged pin (P)—is the new ACP Quality Package by SUESSEN for ring spinning drafting systems.

As shown in Fig. 6, a fibre friction pin is arranged immediately at the cradle spacer of the Active Cradle.
The ACP Quality Package is available—only for the time being—with the size of cradle spacers from 2 to 3 mm (in steps of 0.25 mm), and is principally suitable for yarns of combed cotton Ne 30 and finer. Assured industrial results for coarse yarns are not yet available.

ACP Solution types can be provided for Top Weighting Arms
- HP-A 310/320
- HP-GX 3010
- PK type
- P3.1 type

4. Spinning Results

The ACP Quality Package clearly improves the drafting process. The sector between the front cradle opening and the front roller nipping line, which has so far been critical, now contributes additionally to the drafting process in the main zone.

This substantially raises the quality level of almost all yarn parameters which are influenced by the drafting process. No disadvantages to the running properties of the ring spinning frame have been found. It has to be pointed out, however that the correct cradle setting is of utmost importance. The ACP Quality Package clearly reduces both frequent yarn defects (IPI) and rare yarn faults (Classimat), so improvements can be registered in all fault classes. Therefore the number of clearer cuts is substantially reduced, maintaining the clearer settings. The optimized drafting process is further reflected by an improved mass irregularity (Uster CV value) and results in an optimized utilization of fibre substance (yarn strength). Improvements achievable in every individual case depend on the raw material, staple length, roving twist and total draft.

Since the above-mentioned improvements are exclusively due to the improved drafting process, their influence on the quality of conventional ring-spun yarns, single EliTe® yarns and EliTwist® yarns is almost identical. Yarn hairiness is nearly unmodified by ACP.

Table 1 compares the spinning results of compact yarns from various spinning mills, once without and once with ACP.

5. Summary

On the traditional 3-roller double-apron drafting system of the cotton ring spinning frame, the drafting process in the main zone has not been optimal until now, due to the geometrically related long distance between the two aprons and the front roller nipping line.

The ACP Quality Package by SUESSEN improves yarn quality very considerably due to enhanced inter-fibre friction in this sensible zone.

ACP Quality Package therefore becomes an indispensable spinning accessory in the drafting system of a modern ring spinning machine.

1. Metal Washer for Magnetic Navels

Finally, the metal washer for magnetic navels is available again.

A long time ago, the former metal version of the washer for magnetic navels was substituted by a plastic washer.

The reasons for this substitution were the high effort of manufacturing the metal washer, accompanied by a high amount of second grade parts. Thus the manufacturing costs were high and the resulting price became unacceptable for the customers.

At that time, the succeeding design of the plastic washer allowed the production of homogeneous parts at affordable costs.

Ever since some customers have never been really satisfied with this design of the washer.

One of the reasons is a severe disadvantage of the plastic material:

- The plastic washer can deform thermoplastically when exposed to high heat

This phenomenon occurs when synthetic fibres are processed at high speeds, if a rotor is overloaded with fibre mass (due to a defective yarn detector) or if particularly modern navels (like the SUESSEN ProFil® navels, enabling higher speeds) are used, which can cause a temperature rise at highest speeds and eventually such deformation, too.

**New design of metal washer for magnetic navels**

The new design of the metal washer is not just a copy of the plastic one made out of metal. (Fig. 1)

Considering the arguments of the customers we have revised the design and have solved another problem any magnetic washer always had:

- After an end-break the yarn end always tended to enter the gap between washer and navel. There was a risk for the navel to be pulled out of the channel adapter and to drop into the rotor—causing even more damage….

The new metal washer for magnetic navels is equipped with a flange covering the gap between washer and navel. (Fig. 2)

Consequently no fibres can get between navel and washer any more, so that the a.m. problem is eliminated.

Further benefits of the metal washer for magnetic navels are:

- Thermal conduction: the washer is made of aluminium, so the thermal conduction into the channel adapter is possible. (The plastic washer actually blocked the thermal conduction).
The heat initiated by the yarn friction can now be transmitted, keeping the ceramic surface cooler and enabling higher production, especially with synthetic fibres / blends.

- Reasonable manufacturing costs: modern manufacturing methods and design allow cost-neutral production of the metal washer for magnetic navel compared to the plastic washer.

The new metal washer for magnetic navels, a good product with obvious benefits based on suggestions of you, our customers.

2. CR-Coating for B 174 and B 20 SOLIDRINGS

The CR-coating for SOLIDRINGS was introduced to the market at the ITMA Munich 2007

The CR-coating combines the durability of Diamond coated SOLIDRINGS with the sharpness of Nickel coated SOLIDRINGS. Sharper teeth naturally provide a better yarn quality, due to:

- better opening work / fibre separation, leading to better USTER – CV% and less imperfections
- improved trash extraction, leading to cleaner yarns

These advantages finally lead to less clearer cuts and less ends-down.

Since their introduction the CR-coated SOLIDRINGS have achieved a remarkable market share of 26% (for cotton applications) in the Premium Parts spare parts sales.

Application for CR-coated SOLIDRINGS

Based on extended field tests with different raw fibre materials and tooth forms the preferable application for the CR-coating is the processing of:

- 100% cotton yarns
- yarn count range universal, from Denim to fine count knitting
- tooth forms B 174 and B 20

Customers feedback approve these experiences comparing DN-coated vs. CR-coated SOLIDRINGS:
Denim spinning mills recognize more trash extraction and increased yarn strength and a lower end-break level due to better opening work. In some case higher production speeds were possible.

Knitwear manufacturers see a cleaner and more even appearance of the knit-fabric, while the supplying spinning mills recognize better yarn qualities with less imperfections and less end-breaks.

**CR-coating vs. N-coating**

In terms of yarn quality a difference between N- and CR-coated SOLIDRINGS never was expected, nor determined with any laboratory or field test.

This result is quite obvious, since the sharpness of the teeth is responsible for the degree of opening work and the resulting yarn quality and production parameters. The sharpness of the SOLIDRING teeth is the same with N- or CR coating (see Fig.1).

The advantage for the CR-coated SOLIDRING vs. the N-coating is its life-span, which is at least equal to those of Diamond-coated SOLIDRINGS.

**CR-coated SOLIDRINGS for synthetic fibre materials and Viscose**

Compared to the very smooth surface of a Nickel-coating the CR-coating has a more satiny surface structure – this is benefiting the processing of cotton fibres. The surface stays clean and no deposit built-up is observed.

On the other hand this satiny surface structure is not suitable when processing PES, PES-blends or Viscose. The spin finishes of such fibres tend to stick to the surface structure producing built-ups – finally causing fibres to collect to this built-ups.

**CR-coating**

CR-coating for B174 and B20 SOLIDRINGS.
A perfect application for processing 100% Cotton yarns from Denim to fine knitting yarn counts.
The CR-coating enables best yarn and production parameters for a long service-life.

3. **ProFil® Navels**

As well the new generation of navels, ProFil® Navels were also introduced at the ITMA Munich 2008.

During the phase of development and field testing all data were evaluated to provide some application guide lines for the spinning mills. These guide lines turned out to be very successful, the customers to precisely found the correct navel for their demands. (See Fig. 7 – example for cotton application)

Four different ProFil® navels have been introduced: ProFil®, ProFil®, ProFil®, ProFil® and ProFil® (for further information please refer to SPINNOVATION No. 23).
Of course controlled by the market demands for fine count knitting yarns, the most successful ProFil® navels have been the ProFil®6 and ProFil®SM.

- The ProFil®6 achieved especially at SE9 spinning machines an average production increase of about 9% (vs. the former used standard navels), maintaining the yarn quality and end-break level of former lower production with standard navels.
- The ProFil®SM—according to the application guide preferably used for weaving yarns—as well had a very positive impact in knitting yarn, too. This especially on the newest Open-End machines when exceeding speeds over 130,000 rotor rpm.

At speed levels less than 130,000 rotor rpm still the ProFil®6 navel for knitting yarns is preferably considering the end-break level.

For viscose applications the ProFil®S as well as the MIMA 2 navel were very successful.

- When processing European Viscose brands, the ProFil®S navel provides a very smooth yarn with best yarn quality at an acceptable end-break level vs. any standard navel.
- When processing Asian Viscose brands, the MIMA 2 navel achieves best yarn quality and produc-

tion. (Consequently the MIMA 2 should deserve to be listed as ProFil®navel, too.)

What is the success story of the ProFil® navels?

Due to new designs in the navel geometry and nowadays optimized ceramic technology these new navels reduce the spinning tension compared to the former designs of standard navels.

Since a certain level of yarn tension is required to ensuring the twist impact and therefore enabling spinnability, the ProFil® navels enable (demand) higher spinning speeds. Yarn quality as well is related to the spinning tension, the higher the tension is the worse the yarn quality becomes. Since the ProFil® navels maintain the level of spinning tension at higher speeds the yarn quality is not negatively affected—on the other hand when producing at the same speeds, like with the standard navels, the resulting yarn quality improves due to less spinning tension.
Compact Spinning has firmly established itself as THE method of making superior ring yarn, with SUESSEN's EliTe® being the world’s leading system.

The goal of compacting is to align the fibres in parallel and very close position to each other immediately prior to the twist insertion. This fibre arrangement will give compact yarn with all its characteristics. The elimination of the spinning triangle is merely a consequence of this arrangement.

Let me try to explain what is actually going on in the compacting zone.

All successful compacting systems are characterized by the following:

a.) Between exit of the normal 3-roller drafting system and a nipping line there is a compacting zone
b.) This zone consists of a suction tube with a slot inclined relative to the direction of the yarn path. Negative pressure is applied at this slot.
c.) A perforated transportation means (e.g. lattice apron, metal drum with holes) is used to move the fibres across this inclined slot.

There are two nearly independent physical effects which help to achieve the goal mentioned above:

1. The pneumatic effect

Fig 1 shows the airflow as it has been calculated (using FEM methods). The drawing might require some explanations: imagine the EliTube cut along the line AA, as indicated in the small picture in the right hand bottom corner of Fig 1. The arrows indicate the direction of the airflow as it enters the slot.

It is easy to imagine that the airflow tries to move the fibre strand towards the centre of the slot. The width of the fibre mass is reduced; a step in the correct direction. This effect is present regardless of the inclination of the slot. Adding a “lid” on top of the slot, as done by some systems, may enhance it.

This effect merely pushes the fibres closer together without any impact of them being parallel.
2. The effect due to the inclination of the slot (Fig 2)

This is a dynamic effect. Assume, fibre A has left the front nipping point. Its front portion is now on the lattice apron (perforated drum, or the like) and moving with the speed of the lattice apron. As its “head” H crosses the upstream edge of the slot nothing at all happens.

It gets interesting when it tries to cross the downstream edge:

The suction applied to the slot does not allow the fibre to cross the edge. It is therefore forced to move along the edge.

Now by the law of vectorial addition of speed (we are still well below Einstein’s Theory of Relativity…) the speed of the portion of fibres along the edge increases to

\[ V_H = \frac{V_0}{\sin(\alpha)} > V_0 \]

with \( \alpha < 90^\circ \)

This increase in speed of the portion of fibre moving along the downstream edge causes the fibres to be gently stretched.

Now, imagine a fibre B coming out of the front nipping point at a distance \( d \) from fibre A. It suffers the same fate so to speak. It will also be unable to cross the downstream edge of the slot and will align itself closely to fibre A, as they move to the end of the slot.

Thus, a fibre bundle having a certain width upon leaving the front nipping point, and with the individual fibres neither parallel nor stretched, is transformed into a bundle where the fibres are perfectly parallel and close to each other.

Naturally, the two effects complement each other, but it is obvious that the second effect is several orders of magnitude larger than the first one; also only the second effect stretches the fibres at the same time.

As may be imagined, there is a complicated relationship between the optimum angle \( \alpha \), the suction pressure and the properties of the various fibres.

If the compacting system allows \( V_p \), the speed of the perforated means to be varied relative to the speed of the front roller, the stretching of the fibres may be controlled further.

Much of these important details are not yet understood well theoretically, and—as so often in spinning—one must rely on experience, and on finds surprises every once in a while!

SUESSEN’s EliTe® has the largest population of any compacting system and therefore SUESSEN technical people have very extensive experience.
BERKOL®—Becomes Part of Bräcker AG, Switzerland

Josef Herger, PM and Customer Service, Berkol

Effective on January 1st, 2008 Bräcker AG, Switzerland extended their business activities by integrating the business unit BERKOL® from Huber+Suhner AG, Switzerland.

There are various suppliers both of cots & aprons and of machines for their maintenance. But only Bräcker AG is supplying cots & aprons as well as machinery for their maintenance from its own production facilities in Switzerland, all under the brand name BERKOL®.

BERKOL® top roller grinding system BGS

New spinning processes are conquering the market and confronting component suppliers with new challenges. Compact and Air-jet spinning are increasingly competing on the market with the two established systems of ring and rotor spinning.

The maintenance intervals of top rollers increased substantially since the introduction of the air-jet and various compact spinning systems. Soft cots are recommended for production of high quality yarns today. It is well known and apparent that the drafting process of the compacting systems is wearing out cots of the front line top rollers faster than the conventional ring spinning.

BERKOL® has made a timely response with its automatic grinding system. Only regular and efficient grinding of top rollers guarantees production of high quality yarns. Perfectly buffed and maintained top rollers reduce yarn breaks, minimize lap formation and as a result reduce downtime, resulting in higher productivity and thus profitability. Using the best method of maintaining cots influences directly their performance and the expense associated with their maintenance and replacement.

The fully automatic BGS grinding system stands for a new generation of grinding machines that meets the highest demands. The BGS grinding system has been specially developed for the fully automatic grinding of top rollers for ring spinning, all existing compact systems, roving- and air-jet spinning machines. The concept is based upon a modular design, which can be adapted to customer’s specific requirements.
Grinding and maintenance of EliTops of the SUESSEN EliTe® Compact Spinning System

Experience has shown that the quality of the maintenance of the front top roller and the EliTe® Roller of the EliTop is influencing the performance of the EliTops and subsequently its yarn quality produced.

Especially the essential outside diameter relation of the 2 top rollers needs to be kept constant and precise in order to achieve the required tension draft.

Grinding complete EliTops, i.e. without disassembling the 2 rollers, is not recommended by BERKOL®, as the required parallelism and concentricity of the 2 rollers in such a procedure cannot be achieved. Spinning Mills having a larger amount of spindles equipped with SUESSEN EliTe® Compact Spinning System confirm this fact.

As the gears of the EliTop rollers have to be maintained in regular intervals, it is recommended to grind the 2 top rollers individually on the fully automatic BERKOL® grinding system BGS series equipped with measuring module.

Both cots of the top roller are being measured simultaneously before the grinding process, thus ensuring that indeed both cots are being buffed and that a minimal amount of rubber is being removed. In case a cot diameter falls short of the minimal amount of 0.15 mm to be removed, the top roller is being rejected and sorted out, so that only perfectly and correctly buffed top rollers are being fed to the magazine; ready to use!

Maintaining your EliTops with the BERKOL® grinding system BGS offers you substantial cost savings due to automated grinding and assures best performance thanks to its control functions!
The NAHAR Group of Companies, headquartered in Ludhiana (North India) is a vertically integrated, well-established and highly respected textile conglomerate. They have a large portfolio of products, ranging from spinning to knitting to weaving, processing and garmenting. All this is done on the latest state of the art machinery.

As one of the largest spinning mills in India, the group has over 500,000 ring spindles, including about 65,000 SUESSEN EliTe® Compact Spindles and 5,000 rotors. They are located in various parts of India.

The stand-alone textile complex in Lalru (Punjab), sitting on a piece of land of more than 550 acres, is probably one of the best anywhere in the world.

The range of the products this company makes, as well as the quantity of the output is mind-boggling:

- Yarns ranging from Ne 6 to Ne 120
- Made from cotton (carded and combed), blends with synthetics and 100% synthetic yarns
- Grindle yarns, space dyed yarns, slub yarns, core spun yarns, high twist and reverse twist yarns, and of course compact yarns
- Over 30,000 kg/day of knitted fabrics, produced on circular and flat bed knitting machinery
- More than 40,000 pieces of knitted garments/day are produced
- More than 100,000 linear meters of fabric are produced on NAHAR’s looms
- More than 10,000 shirts and trouser are produced in one day

Quality being on top of NAHAR’s priority list, the testing laboratories are equipped with all the modern testing facilities needed to ensure uniform and high quality of the output.

The emphasis, which NAHAR puts on quality, is further evident by the fact that all production facilities are IS/ISO 9001-2000 certified by the demanding Bureau of Indian Standards.

Meet Mr. Kamal Oswal, Vice Chairman and Managing Director in his modern, functionally designed head quarter in Ludhiana. It is obvious that Mr. Kamal Oswal is a busy man with a tight schedule, where time is at a premium. After a very short wait, Mr. Oswal comes to see us. While it is clear that he has no time to waste, he appears relaxed, but the conversation quickly turns to the business, and you notice quickly that Mr. Oswal has a complete understanding even of small technical details. Soon you notice, that you are meeting a person with a clear vision and the will, the means and the energy to make his vision come true. He is truly an industry leader, not a follower.

Starting out as a tiny hosiery and worsted unit in Ludhiana it was incorporated as a private limited company in 1980, and—a short three years later—as a public limited company.

Mr. Oswal’s leadership qualities built the present NAHAR Group of Companies from those modest beginnings in a short 25 years.

NAHAR’s outstanding success is further evidenced by the official recognition as an Export House, followed by Recognized Export House by the Government of India, all in the short span of 8 years after incorporation.

Good leadership “breeds” excellent teams of dedicated professionals, and this is clearly evident the minute one enters any of the production facilities. Everyone we have met there is dedicated, hard working and very skilful.

Mr. Oswal knows that we have only one environment, and we must preserve it for posterity. Since for Mr. Oswal good ideas must become reality, all his facilities are ISO 14 001 certified, for
good and responsible environmental management—again by the Bureau of Indian Standards.

Many international brands—GAP, Arrow, Old Navy, Pierre Cardin, Van Heussen, IZAD, Quick Silver to name a few—regularly source their needs with NAHAR.

In addition, NAHAR launched their own brand labels, Monte Carlo, Canterbury and Cotton County, which have proven to be very successful. (The author of this article can wholeheartedly attest to the quality of the shirts and trousers!)

The cooperation between NAHAR and SUESSEN began some four years ago, and has proven successful. SUESSEN of course feels honoured to count NAHAR as a customer, and Mr. Kamal Oswal tells us that he is satisfied with the performance of SUESSEN’s products and services. His satisfaction is evidenced by the fact that NAHAR has ordered 65,000 EliTe® and EliTwist® Compact Spindles for LMW ring spinning frames.

At NAHAR one knows that standing still means falling behind, and therefore further installations of compact spinning are in the pipeline.

For SUESSEN, the recognition by Mr. Kamal Oswal and his company does not mean, SUESSEN will rest on its laurels! It is a challenge to earn this trust every day!
The spinner earlier has always been perplexed with the simple question whether he was over-spinning, or under-spinning with the cotton provided to him. He was always asking himself as a sensitive spinner whether he was doing justice to the cotton while he was spinning a yarn count—in terms of cost effectiveness, productivity, quality and sales revenue.

Cotton being a natural fibre has a considerable variation in its properties even in the same category—which is known to all. The spinner as a team leader had to optimize his process to get the best yarn from his cotton, but the question: “Well, am I doing this right?” always was coming to his mind. He had been in search all the time of a key process answering this highly important question.

Ring spinning as the most acceptable yarn spinning system has seen several changes to improve quality and productivity within the course of time but the changes so far could not satisfy the spinner's needs.

The revolutionary change came in 1999/2000 when SUESSEN and others introduced their compact spinning systems globally; the full exploitation of cotton fibre in terms of quality, productivity, end breakage rate became possible and gave relief to the spinner.

Compact spinning (the system ensures optimum utilization of costly raw material with minimum loss and damage to the fibre) improves the yarn quality tremendously, most importantly on the hairiness aspect.

We introduced SUESSEN’s EliTe® Compact Spinning System in 2004, converting 2 ring frames and in due course of time, realizing the advantages of the system and the market acceptability of the yarn and end product, we ordered for total capacity for EliTe®CompactSet and EliTwist®CompactSet on 35,000 spindles.

The yarn results achieved with SUESSEN EliTe®Compact Yarn Ne 50/1 and Ne 40/1 compared to normal spun combed yarn of same counts are as tabulated in table No. 1.

The results achieved with SUESSEN EliTwist®Compact Yarn Ne 40/2 compared to normal TFO yarn Ne 40/2 are as per table 2.

These tables speak about the superior quality achieved with compact yarn and EliTwist® Yarn and apart from this quality improvement there is gain in

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production in ring frame by applying optimum twist multiplier for a particular cotton, say: even with a twist multiplier of 3.5 one is able to spin the yarn.

Compared to TFO yarn, there are considerable savings when producing EliTwist®. As assembly winding and the TFO process are eliminated, the cost of power and labor associated with these processes is eliminated. Also the production rate of the ring spinning process is more than double.

We are marketing a very popular brand of garments. The compact yarn has enhanced the brand value of the product because of its excellent contribution to the fabric structure in terms of

- extra smoothness on fabric surface
- resistance against abrasion and pilling
- dense fabric
- superior draping characteristics
- lustrous appearance of fabric because of excellent dye pick-up.

We have replaced classical T.F.O. double yarn in certain market clusters with EliTwist® Yarn completely. In some other markets the EliTwist® Yarn has replaced the requirement of gassed hosiery yarn.

We find SUESSEN EliTe® and EliTwist® Systems very user friendly, easy to maintain and consistent viz-a-viz certain other compacting systems available in the market. Though rarely needed, SUESSEN Service Teams stand by the mill for quick help with queries and problems.

The added advantages we find with compact spinning systems is a clean atmosphere in department, better yarn realization because of less invisible loss, increased workers’ job satisfaction due to less fatigue while maintaining negligible end breakage rate in ring frame and a sense of mental satisfaction having worked with a sophisticated instrument.

Of course, nonetheless, we feel a continuous training to the technicians, workmen, and laboratory personnel is necessary to get best results from the system and for this a joint venture from SUESSEN and mills management is the demand of the time and the endeavor should continue.

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1 Under-spinning: Using too good a cotton for a given yarn count
Over-spinning: The opposite.
SUESSEN products are designed and manufactured based on our customers’ suggestions and the ideas of our R&D Centre WST—and they are appreciated all over the world. Developed by creative engineers, manufactured with passion on high-end manufacturing plants applying unique methods, our products are apt to bring about high customer benefit through productivity, reliability and quality. This demand of our customers has top priority in our production plant at Süssen/Germany, where the SUESSEN technology components are manufactured (Fig. 1).

Our philosophy of producing technology for the textile industry focuses on:

- Utmost precision
- Innovative manufacturing technologies
- Intelligent quality assurance and quality management
- Professional training and continuing training on the job of our employees

We generally understand utmost precision as the constant and consistent machining of components and structural groups in the micrometer range. One micrometer is the thousandth part of a millimetre, i.e. 0.001 mm (a human hair for example has a diameter of 0.060 mm). The manufacturing tolerances of the most important SUESSEN technology parts are in the range of 0.25 to 10 µm (Fig. 2).

We achieve this high precision by using high-end CNC machines and other equipment. CNC means “computer numerical control”, i.e. a computer program is controlling the machines and equipment. Based on the CAD drawing, the machining program, which accounts for all the parameters...
required, is programmed at a programmer’s workplace, controlled and optimized by means of computer simulation. The program is finally transferred by means of encoded radio data transmission to the relevant machine or equipment to produce the technology components with high and consistent precision (Fig. 3).

To ensure this precision at any time, fully automatic systems in form of robots are applied in many positions. So handling errors are virtually impossible, and our customers can benefit from unchanging and consistent yarn parameters in every spinning position (Fig. 4).

Development and application of unique and innovative SUESSEN manufacturing technologies make the difference to conventionally produced technology components. Our “original components” stand out for their high quality and extremely long service-life in everyday industrial practice of our customers’ mills world-wide (Fig. 5).

All our activities are subject to a sophisticated quality assurance system, which ensures and controls quality, starting with development/design, over raw material analysis and through all steps of production up to final inspection. This system is ISO 9000 based, but we have adjusted and completed it to meet the specific requirements of our customers. Consequently, a consistent quality system is at our customers’ and our disposal. At numerous milestones between product development, first laboratory tests and wide-scale field tests, extensive inspection is made to analyse and verify the expectations made in a product. As soon as all hurdles have been jumped, the SUESSEN technology component is released for series manufacture and for sale.

Supervision of our series production starts with raw material purchase; only certified suppliers deliver the raw material, which in many cases is specifically
SUSSSEN, and the corresponding certificate. Right in the goods receiving department, the material is subjected to extensive analysis and measurement, which is subsequently evaluated. (Figs. 6, 7, 8)

Depending on the type of manufacture, production is controlled in different ways. All steps of manufacture are defined in detail by process instructions. Each step is ruled by a separate inspection instruction detailing the amount of inspection to be carried out. All inspections relating to manufacturing processes are recorded by our production planning and quality assurance system and used for statistics. Data for each dimension, each process step...
can therefore be recalled consistently at any time from a central data store (Fig. 9).

In addition, we use special measuring methods designed for SUESSEN to control certain quality features of our products. These tailor-made measuring methods and characteristics ensure a high and consistent quality, which practically cannot be copied by other manufacturers (Figs. 10, 11, 12).

All our equipment, machines, systems and methods are just as good as the employees using them. This is the reason why we attach great importance to our employees' training, which we carry out in our training centre at Süssen. We distinguish between professional training of apprentices and continuing on-the-job training of our employees.

In professional training we train our apprentices during three years to learn a recognised profession like production technologist. Training comprises theory and practice and takes place partly in our training workshop, but also actively in our manufacturing plant.

As a matter of course, all colleagues in manufacture, administration and development/design are trained at regular intervals. So we can ensure that apart from applying modern and state-of-the-art equipment, all our employees always maintain an up-to-date standard of knowledge (Fig. 13).

In addition, we at SUESSEN benefit from a very dense network of other well-known companies of the machine tool industry and automotive industry (Mercedes-Benz, BMW, Schuler, Trumpf, etc.) and their sub-suppliers in close vicinity to our location in Süssen.

To make a long story short: Based on our clear and strict manufacturing philosophy, we are producing “technology for the textile industry” day after day in our production plant in Süssen/Germany, and this by now for over 80 years.
Produce More and Better
High Grade Worsted Fashion Fabric

Xu Rong Liang, President Danmao Spinning Mills, China

The 16,000-spindle worsted yarn production line of Danmao Textile produced a total of 6.2 million square metres of fabrics in 2007, 85% of which were sold to Europe, America, Japan, Korea, Australia, South America, Hong Kong, Taiwan and other countries and regions.

**Aomeiya** (Danmao brand name) worsted wool fabric was listed as “Jiangsu Famous Brand Product”, “Jiangsu Hi-Tech Product” and “National Inspection Exempt Product”.


With the development of the global economy, the consumption in clothing increases continuously, and the trend of products moves more and more towards high grade, light, casual, comfortable, fashionable, individualized, ease of maintenance worsted fabrics.

China is gradually changing into a large textile country more in the strength of quality than merely the quantity in the past, with the product quality and grade improving quickly, the increasingly intense competition, and R&D in new products and innovation becoming a trend.

Fig. 1
To meet the requirements on development, expand the scale and improve the quality and execute the strategy of differentiation and individualization, we introduced SUESSEN’s EliTe® and EliTwist® Compact Spinning Technology from 2001, and started spinning the EliTe® Compact Yarn, resulting in optimization and improvement of the product design and the entire production process, as well as the development and production of worsted high grade fashion fabrics. The advantages of the EliTe® Compact Spinning System, especially in improving the product quality, substantially promoted the reputation and rapid development of Danmao Textile.

1. Introduction of compact spinning technology and equipment

In conventional ring spinning, when roving is drafted and twisted into yarn, the fibre strand will form a spinning triangle. The uncontrolled fibres at the edge of the spinning triangle will generate the fly, or the fibre ends sticking out will cause higher yarn hairiness. The fibres at the edge and in the middle within the spinning triangle are under the different strain during spinning. The fibres under higher strain will break first, so the yarn strength will be affected and the fibres at the edge of the triangle cannot be twisted smoothly into yarn, affecting the yarn evenness and elasticity.

EliTwist® Technology is siro spinning based on EliTe®, in which the 2-roving feeding device is adopted, for 2 rovings to feed in with a spacing; 2 drafted strands pass the V-shaped negative pressure suction port to form the compact strands under the negative pressure, and then they are combined and twisted to form the yarn. Either compact strand is provided with the individual twist with the same direction of the yarn due to transmission of the yarn twist, then the EliTwist® yarn similar to the ply yarn is formed.

EliTe® Spinning eliminates the spinning triangle and provides the EliTe® Yarn with advantages unrivalled in the common ring spinning yarn, with less hairiness, high strength, better elongation and elasticity, and significant improvement in CV value, thick and thin places and neps. EliTe® Yarn and EliTwist® Yarns are featured with the following characteristics:

1) With the improved spinning strength, the designed spinning twist can be reduced to achieve the softer yarn, high yarn output and low energy consumption;
2) The yarn breaks are reduced to improve the production efficiency and the finished product rate;
3) The fly generation is reduced and the production environment is improved;
4) The spun yarn can be used as single warp and single weft to reduce the production cost and greatly improve the spinning efficiency;
5) The sizing is not required in weaving to reduce the processing costs;
6) The woollen fabric is in bright finishing, good lustre, high strength and performing excellently in regard of fuzzing and pilling.

EliTe® and EliTwist® Spinning can greatly improve the quality and grade of the worsted fabrics, reduction of costs and others, so we introduced 12 EliTe® Compact Spinning Sets (5,000 spindles) and 2 EliTwist® Sets (800 spindles) on Shanghai Erfangji EJ519 spinning frames. The investment was greatly saved and the costs were reduced significantly.
2. Development and production of compact spinning products

With SUESSEN’s technical and technological support we started to use the EliTe®Compact Spinning Technology to optimize the spinning process and the low temperature dyeing. Together with the introduction of the rapier looms from Italy suitable for weaving fine yarn count and single warp and single weft fabrics, the state-of-art dyeing and finishing equipment, innovation in process, development and design of product types, etc., we started the production of high grade fashion fabrics.

EliTe®Compact Spinning showed the expected advantages over the conventional ring spinning. The yarn evenness was significantly improved in the Company. The yarn became obviously bright, and the hairiness reduced by up to 80%;

1) The yarn strength was improved by 10 to 20%;
2) The yarn evenness (USTER CV %) was improved by about 10%, thin places decreased by 20–40%, thick places by 30–40% and neps by 60–80%;
3) The abrasion proof performance was improved significantly, fuzzing and pilling of the single warp types, especially woolen types, decreased significantly, to realize the single warp weaving.

We are using EliTe®Compact Spinning for spinning 120S/2 and other high yarn count EliTe®Yarns, which greatly improve the quality and grade of our products to exquisite, gentle, tender and luxury products.

Our compact yarn tweed and 100% wool two-side elastic tweed were listed as 2005/06 Fall/Winter trendy fabric, and our fine count 100% wool tweed (product number E236016) was awarded the 2nd Prize in 2007 Weierjia New Product Assessment.

We have developed various fine count single warp and single weft worsted fabrics with different raw materials, spun yarn up to 60s/1 and many functions, featuring light and thin structure, soft and smooth hand, high tightness and elasticity, good suspension, high permeability and woolen finish, which are ideal fabrics for high grade suits, casuals, fashion wears, etc., favoured by customers and keep the pace with the development trend of the high grade fashion worsted fabrics:

- fine count single warp and single weft 100% wool valitine (product number 25498) and wool/polyester fine count single warp and single weft tweed (product number 331152) were listed as 2005/2006 Fall/Winter China Trendy Fabric
- fine count single warp and single weft 100% wool valitine (product number 25945 ) was listed as 2006 Spring/Summer China Trendy Fabric
- wool/polyester fine count single warp and single weft valitine (product number35645-1/2) was awarded with 1st Prize in Weierjia Cup competition of the wool spinning industry in China
- fine count single warp and single weft valitine (product number E352073) was awarded the 1st Prize in 2007 Weierjia New Product Assessment.

The output of single warp and single weft worsted fabrics are high, and no plying or winding is required in spinning, to reduce the production cost and improve the efficiency. In addition, the development, production and technology of high count single warp and single weft worsted fabrics shall greatly facilitate the development and production of worsted wool fabrics, also promote the development and production of single warp and single weft product types, spun yarn weaving, new spinning technologies and relevant equipments.

To better develop and utilize the special animal fibre resources in China, we have started the development and production of multi-component worsted fabrics with wool and some high-grade special animal fibres, including cashmere, rabbit hair, camel wool, spun silk, etc., according to guideline of 11th Five Year Wool Spinning Development Planning. With the compact spinning...
technology established in the production process and technology of high grade special animal fibre worsted fabrics, we applied for the patents for development and production of special animal fibre fabrics:

- Cashmere serge was listed as 2005 Spring/Summer Trendy Fabric\(^2\)
- machine washing cashmere tweed was listed as 2006/07 Fall/Winter Trendy Fabric\(^3\)
- cashmere rabbit hair serge was listed as 2007/08 Fall/Winter Trendy Fabric\(^3\)
- silk/wool tweed and wool-terylene-hemp ironing tweed were listed as 2008/09 Fall/Winter Candidate Trendy Fabric\(^3\)
- silk-wool herringbone was listed as 2008 Spring/Summer Candidate Trendy Fabric\(^3\).

We also adopted the compact spinning in development and production of fine count high twist worsted fabrics, keeping in pace with the trend of high grade worsted fashion fabrics:

- 100% wool high twist weft elastic tweed was awarded 2006/07 Trendy Fabric\(^2\)
- wool-terylene high twist stripe valitine was listed as 2008 Spring/Summer Candidate Trendy Fabric\(^3\)
- wool-terylene high twist tweed (product number E334780-1) was awarded with 2\(^{\text{nd}}\) Prize in 2007 Weerjia New Product Assessment\(^1\)
- 100% wool high twist tweed (product number E236570P2) was awarded with 3\(^{\text{rd}}\) Prize in 2007 Weerjia New Product Assessment\(^1\).

3. Compact spinning technology promoting development of enterprises

With introduction of SUESSEN EliTe\(^{\text{®}}\)Compact Spinning equipment with the advantages of the compact spinning and EliTwist\(^{\text{®}}\)Spinning, we substantially improved the product quality and grade and make great achievements in product development. We have developed and produced the pure wool, spun silk, cashmere, mohair, hemp, bamboo fibre, Tencel, viscose, lycra, XLA, T400, Sorona Coolmax Thermolite stainless steel wire Kuralon and other functional fibres for high grade fashion fabrics, in the forms of single warp and single weft, fine count light and thin, fine count high twist, special animal fibres, etc.,

Development of special animal fibre fabrics will significantly increase the technical content of wool spinning products and uplift the taste and grade, further promote the economic growth and increase the benefit of the companies, spur the new product development and improve the competitive edge of the enterprises. Furthermore the project will help adjust the structure of the special animal fibre products in China and upgrade the wool spinning products and their production technology.

Fig. 2
also with the functions of machine wash, anti-static, nano Lotus Effect Function, nano antisepsis, high elastic, anti-shrinkage, suits for travel, moisture absorption and quick drying, odor proof, extreme black, refrigerating and extreme black, silk protein finishing, etc., forming the product features, realizing the better economic benefit, improving the corporate competitiveness and upgrading the image and strength of Danmao Textile.

With EliTe®Compact Spinning technology, we shall further proceed in new product development and fully utilize the advantages of the technology. We shall, according to Guideline of National 11th Five Year Wool Spinning Development Planning, be paying close attention to the domestic and foreign progress in wool spinning technology and the trend of wool spinning products, enhance construction of the innovation team and system, and the cooperation with the universities and institutes and experts in wool spinning, train and introduce technical personnel, and improve the ability of self innovation of the Company. We shall make full use of Worsted Wool Spinning Fashion Fabric Development Base of National Textile Product Development Centre, follow the differentiated and individualized development mode, place more importance on innovation and new product development, and focus on the high grade, light and thin, casual, fashionable, individualized, functional and ease for maintenance products, especially the worsted wool spinning fashion fabrics.
To meet the requirements of modern worsted ring spinning, you do not just need good preparatory machines up to the finisher to produce uniform sliver, but also a sturdy ring spinning machine. Almost all machines on the market today come up to this requirement; they are mechanically reliable over many years.

But to produce a high-end yarn quality, more than a sturdy basic machine is necessary, because the yarn is produced in the drafting system. And here it is of importance, which top weighting arm is installed.

Today, many new types of raw material break into the market, like bamboo and milk fibres, or new cellulose fibres like Lyocell. And well-known material like cashmere and angora, which are rather demanding in spinning, get increasingly popular. Many an old cheap or pneumatically loaded top weighting arm is no more in a position to fully meet the demands.

A top weighting arm should offer the following important characteristics to satisfy the high demands of a worsted spinning mill:

- sustainable production of optimum yarn quality over a very long period of time
- high consistency of all yarn parameters
- minimal variation between spinning positions
- no restrictions in regard to raw material
- free from wear
- easiest operation and low maintenance

Spindelfabrik Suessen have been supplying top weighting arms with these characteristics to customers all over the world for many years. Our current model HP-GX 5010, shown for the first time at ITMA 2007 in Munich, is already being delivered to the market, and first installations are running perfectly as expected producing the high-grade yarns as anticipated.
The HP-GX 5010 is an improved top weighting arm with even closer tolerances and better top roller retainer than its predecessor, on which it is based. This is the well-known HP-A 510 top arm which has satisfied even the highest demands since its introduction in 1988. It has been installed particularly often in Chinese spinning mills. The HP-A 510 has been applied on hundreds of new ring spinning machines world-wide and it has frequently been used to modernize existing ring spinning plants.

The HP-GX 5010 is going to continue this success. This type of top weighting arm, too, can be specified with OEMs and retrofitted to all types of existing worsted ring spinning frames.

Being equipped with plate springs as all its predecessors, the HP-GX 5010 offers one of the main features of a modern top weighting arm: transmission of load from weighting spring to top roller free from wear. This avoids loss of load due to friction in the course of time. To the plate spring, guaranteeing the reliability of the HP-GX 5010, a particularly wide top roller retainer is applied, in which the saddle of the top roller is milled by a special process, and which guarantees parallelism between the individual top rollers on the one hand and to the bottom rollers on the other hand.

The top weighting arm offers the feature of partial load relief.

The approved new handle, successful already in short-staple spinning (HP-GX 3010, HP-GX 4010), provides the whole HP-GX family with a striking characteristic.

All top rollers are adjustable with regard to pressure load and position. Distance or load on all weighting units are set with the units being installed.

Top rollers are available for spindle gauges of 75 and 82.5 mm.

Corrosion tests carried out by independent laboratories showed that the
non-corrosive surface coating has three times more resistance than ever achieved.

The back and front top rollers can be obtained either without cots or with buffed cots of all popular brands. They can have diameters of 40 mm or 50 mm.

The cradle is made of steel. The high-stability principle guarantees a uniform load on the fibres at the front edge of the cradle.

The Distinctive Features of the HP-GX 5010:
- position of the top rollers completely parallel to the bottom roller axles
- load transmission without friction
- loss of load and load difference on the bosses is avoided
- minimal variation between the spinning positions
- reliable fibre clamping and guidance
- all fibre materials can be spun
The rounded edges of low-friction polymer create a minimum degree of friction on the top aprons.

The redesigned retention system provides for the safe position of the cradles when the top weighting arm is opened.

HP-GX 5010 is always supplied together with our proven top rollers with microseal, which have a long operating life with low maintenance and are free from play even after many years of operation.

The SUESSEN HP-R Top Rollers are of the loose boss type with non-removable bosses. The standard saddle will provide additional support to the guidance and precision of the top roller position.

The precise apron top rollers have a rubber cot reducing the slippage between apron and roller. The top roller boss diameter is adapted to the specification of the other top rollers. It ensures a perfect smooth running of the apron and avoids the accumulation of dirt.

The recess of the apron top roller can be chosen between 0.5 and 1.5 mm.

The HP-GX 5010 top weighting arm, like the HP-A 510 in recent years, is one of the successful features of our EliTe® Compact Set-L for the modernization of existing worsted ring spinning frames. With this design, the original front top roller is replaced by the EliTop specified to fulfill the requirements.

First installations with the new top weighting arm have already been completed and they are operating as expected to the entire satisfaction of the customers.

### Mill Fibre Material Yarn Count Processing Twist T/m Uster CV% Thin -50% Thick +50% Neps + 200% cN/tex Elongation % Hairiness Uster (H) Hairiness Zweigle (S3)

<table>
<thead>
<tr>
<th>Mill</th>
<th>Fibre Material</th>
<th>Yarn Count Nm</th>
<th>Processing</th>
<th>Twist T/m</th>
<th>Uster CV%</th>
<th>Thin -50%</th>
<th>Thick +50%</th>
<th>Neps + 200%</th>
<th>cN/tex</th>
<th>Elongation %</th>
<th>Hairiness Uster (H)</th>
<th>Hairiness Zweigle (S3)</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>100% wool</td>
<td>21.5 µ</td>
<td>28</td>
<td>HP-GX 5010</td>
<td>397</td>
<td>18.4</td>
<td>189</td>
<td>53</td>
<td>28</td>
<td>5.8</td>
<td>10.1</td>
<td>7.3</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>HP-A 510</td>
<td>401</td>
<td>18.7</td>
<td>191</td>
<td>61</td>
<td>29</td>
<td>5.6</td>
<td>10.0</td>
<td>7.9</td>
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<tr>
<td>B</td>
<td>100% wool</td>
<td>20.5 µ</td>
<td>48</td>
<td>HP-GX 5010</td>
<td>600</td>
<td>18.2</td>
<td>188</td>
<td>50</td>
<td>25</td>
<td>6.3</td>
<td>11.5</td>
<td>6.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HP-A 510</td>
<td>592</td>
<td>18.3</td>
<td>199</td>
<td>52</td>
<td>31</td>
<td>6.1</td>
<td>11.1</td>
<td>6.1</td>
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<tr>
<td>C</td>
<td>100% wool</td>
<td>17.5 µ</td>
<td>96</td>
<td>HP-GX 5010</td>
<td>950</td>
<td>21.2</td>
<td>624</td>
<td>169</td>
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<td>5.5</td>
<td>11.7</td>
<td>4.1</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>HP-A 510</td>
<td>958</td>
<td>21.2</td>
<td>632</td>
<td>174</td>
<td>19</td>
<td>5.4</td>
<td>11.2</td>
<td>4.3</td>
</tr>
<tr>
<td>D</td>
<td>55/45% PES/Wo</td>
<td>68</td>
<td>HP-GX 5010</td>
<td>780</td>
<td>20.4</td>
<td>422</td>
<td>181</td>
<td>79</td>
<td>11.9</td>
<td>13.8</td>
<td>3.4</td>
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<td>HP-A 510</td>
<td>787</td>
<td>20.6</td>
<td>444</td>
<td>193</td>
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<td>11.8</td>
<td>14.1</td>
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<td>D</td>
<td>40/60% PES/Wo</td>
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<td>HP-GX 5010</td>
<td>780</td>
<td>21.0</td>
<td>609</td>
<td>181</td>
<td>60</td>
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<td>13.8</td>
<td>4.2</td>
<td>1685</td>
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<td></td>
<td></td>
<td></td>
<td>HP-A 510</td>
<td>774</td>
<td>21.4</td>
<td>622</td>
<td>192</td>
<td>58</td>
<td>8.1</td>
<td>13.1</td>
<td>4.4</td>
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<tr>
<td>D</td>
<td>100% PAC</td>
<td>34</td>
<td>HP-GX 5010</td>
<td>374</td>
<td>13.9</td>
<td>14</td>
<td>5</td>
<td>11</td>
<td>15.6</td>
<td>22.5</td>
<td>8.8</td>
<td>3684</td>
</tr>
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<td></td>
<td>HP-A 510</td>
<td>379</td>
<td>14.0</td>
<td>17</td>
<td>8</td>
<td>10</td>
<td>15.6</td>
<td>21.7</td>
<td>9.4</td>
</tr>
</tbody>
</table>

**EliTe® Compact Spinning**

| E    | 100% wool      | 19.5 µ        | 40         | HP-GX 5010 | 660       | 15.1      | 29        | 11          | 8     | 6.3         | 11.8                | 2.8                  | 539                  |
|      |                |               |            | HP-A 510   | 657       | 15.0      | 29        | 12          | 11    | 6.4         | 11.5                | 2.9                  | 577                  |
| C    | 100% wool      | 17.5 µ        | 96         | HP-GX 5010 | 903       | 20.6      | 562       | 121         | 14    | 6.0         | 13.6                | 3.3                  | 341                  |
|      |                |               |            | HP-A 510   | 912       | 20.9      | 579       | 123         | 17    | 5.9         | 13.2                | 3.3                  | 356                  |
Wilhelm Stahlecker GmbH (WST) –
Centre for Research and Development

Gerd Stahlecker, Managing Director

Wilhelm Stahlecker GmbH (WST) was founded in 1948. Right from the start, the main concern of WST was the spinning of staple fibres. Demands for better utilization of fibre substance, better yarn quality, increased efficiency, energy saving, subsequent yarn processing without problems, higher or specially adapted quality of textile articles have always been the impetus for new developments. WST designed units, components and automated systems, which fulfilled the customers’ desires, and sometimes exceeded all expectations. Not only the technologists dealing with spinning at WST, but also the engineers responsible for design, measuring technique or trials are familiar with every detail of spinning.

However beautiful the rural environment of the Swabian Alb as location of WST may be, it was hard for earlier generations to survive in this barren landscape. Without inventiveness this was almost impossible. This characterized the people living here. Most WST employees are living in the near neighbourhood. They all harbour this “Swabian Tinkerer”, and so WST continues a tradition and culture determined by ingenuity, inventiveness, and pioneering spirit.

In six decades of continuous research and development we gained new findings in technology by a multitude of trial series, and subsequently tried to put them into practice by sophisticated design. Be it ring, rotor, air-jet or friction spinning—we at WST are familiar with every spinning method. WST’s sphere of competence reaches far beyond spinning technology and mere mechanics. The fields of activity are manifold and cover, for example, techniques dealing with bearings, drives, surface and air-flow.

In the year 1952, the two companies Spindelfabrik Suessen GmbH and Wilhelm Stahlecker GmbH started their most successful cooperation. WST now developed exclusively for Spindelfabrik Suessen. From then on, the two enterprises have made a successful team setting out on ever new targets of development with never-ending enthusiasm up to the present time.

SUesseN engineers accompanied and optimized WST inventions finally manufactured by SUesseN, so that the products could be sold successfully in the market. New directions of development opened by SUesseN marketing experts met our customers’ demands. SUesseN, WST and their customers form a team of partners complementing one another to the benefit of all. More than 5000 patents filed in many countries in these six decades bear eloquent witness to extensive activities of development at WST and to the ideally fruitful partnership between SUesseN and WST.

Customers’ demands changed over the decades. The general technical progress opened ever new possibili-
ties of satisfying them with increasing refinement.

Until the late sixties, spinning was synonymous with ring spinning. Our customers then claimed more yarn production in addition to better yarn quality. WST was asked to improve spindle bearings and drafting systems. The seventies saw the rise of rotor spinning. SUESSEN and WST immediately recognized the potential of this spinning method and became pioneers of rotor spinning.

Fig. 3

The middle of the seventies marks the beginning of spinning machinery automation. Today’s automation of rotor spinning machines is based on fundamental WST patents. SUESSEN-WST supplied the first piecing-up automats for rotor spinning machines.

A real renaissance of ring spinning took place in the late eighties, and this was mainly due to the relocation of spinning mills to Asian countries which started then. SUESSEN-WST launched new components for ring spinning machines.

Fig. 4
The introduction of compact yarn at the end of the nineties ushered in a new era. Today, ten years later, the only question spinning mills are confronted with is how high the percentage of compact yarn should be to allow them to compete successfully.

For every period WST and SUESSEN jointly found products which were received by our customers all over the world with great enthusiasm.

Examples:
in the fifties and sixties
- UT Top Weighting Arm
- SH Roller Bearing Spindle

Top rollers: DSN (loose boss type) and HSL (fixed boss type in the seventies and eighties)
- TwinDisc Rotor Bearing for rotor speeds up to 150,000 rpm
- SE 6, SE 7, SE 8, SE 9 and SE 10 Rotor SpinBoxes including various spinning accessories
- SpinCat/CleanCat Automation of Rotor Spinning Machines
- HP-S 68, NASA-HP-S 68 Spindles, YarnCatcher (together with NOVIBRA)
- HP-A Top Weighting Arms
- ParafiL (Wrap Spinning Machine)
- PLYfiL (SpinAssemblyWinder)

in the nineties up to the present time
- Fiomax ring spinning machines (short- and long-staple version)
- EliTe®Compact Spinning Systems
(short- and long-staple version)

- EliTe CompactSet for modernizing ring spinning machines
- EliTwist® Technology
- HP-GX Top Weighting Arms

Since WST has become part of the Rieter Group, WST now occupies the position of a partner in development also in other Rieter Business Units, a partner whose competence in all respects of spinning is highly estimated.

The future will present new challenges. At WST, 50 engineers and technologists are busy with new developments in spinning, which will result in new products enabling the customers of Spindelfabrik Suessen to defend their successful position in the market.
... it is hard to win a customer, but very easy to loose one!

Research by marketing consultants, but also by academic institutions has shown that there is a significant discrepancy between the assessment of the customer/supplier relationship made by the supplier and made by the customer; invariably the supplier’s assessment is more positive than the customer’s.

This difference in assessment may have dangerous consequences: The supplier is not favored with the pending order, but his competitor gets it instead. The salesman is shocked; after all he is of the opinion that his service is

<table>
<thead>
<tr>
<th>CUSTOMER COUNTRY</th>
<th>very good</th>
<th>good</th>
<th>fair</th>
<th>poor</th>
<th>n.a</th>
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</thead>
<tbody>
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<td>0. General statements:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. How would you assess our overall performance, products and services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Given what you know about other suppliers would you recommend our products and services to business partners or friends?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Given what you know about other suppliers would you repurchase our products and services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Your assessment of our products with respect to:
   - Quality
   - Does our product range meet your requirements?
   - Userfriendly application
   - Product range in general
   - Price / performance ratio
   - Availability / delivery times
   - Innovations

2.a Quality of our sales and technical support provided by our staff, with respect to:
   - Technical expertise of your contact person
   - Practical support in solving problems
   - Competent handling of queries
   - Availability of your contact person
   - Authority in decision-making
   - Sufficient visits and contacts

2.b Quality of our sales and technical support provided by our representative, with respect to:
   - Technical expertise of your contact person
   - Practical support in solving problems
   - Competent handling of queries
   - Availability of your contact person
   - Authority in decision-making
   - Sufficient visits and contacts

3. Quality of our marketing with respect to:
   - Product documentation
   - Presence / presentation at trade exhibitions

4. Quality of our web site (www.suessen.com) with respect to:
   - Information available from our web site
   - Userfriendlyness
   - Practical use of our technical support section (on the web site)

5. Quality of our sales support and processing with respect to:
   - Response to queries (price, delivery time, availability)
   - Comprehension of sales documents (offers, acknowledgements, invoices)
   - Timely information of delays
   - Handling of complaints
   - Observance of your requests

6. Quality of our technical support: services and installations with respect to:
   - General level of skill and competence of service engineers
   - Availability in case of emergencies
   - Efficiency and general appearance
   - Training of your operators and maintenance staff

Further comments and personal suggestions:

Place: ……………… Date:……………… Name:……………… Occupation: …………………
excellent, while—quite obviously—the customer does not share this opinion!

The SUESSEN management is well aware of this discrepancy and decided to poll our customers’ opinion about the quality of the various SUESSEN activities.

With the help of professionals, an elaborate questionnaire was designed. It asked a total of 36 questions, which were grouped under eight different headings. For each question, the customer could select five answers: Very good, good, fair, poor, no reply.

The questionnaires were sent to our representatives in the relevant countries, and they forwarded them to the person responsible within the organization of each customer.

All in all, about 235 questionnaires were distributed, and we received about 95 responses; so 40% of our customers replied. According to the professionals, this is a very acceptable rate of return, considering the complexity of our questionnaire.

The customers responding represent considerably more than 50% of our EliTe® installations. With our Premium Parts business such a percentage is more difficult to give: These are technological parts having a finite life cycle, and any percentage might be difficult to interpret; still a large portion of our PP customers returned the questionnaire.

The responses to the individual questions are summarized in Fig 2.

We feel that this survey permits a number of conclusions to be drawn:

a) Generally speaking, our service seems to be ‘Good’, with ‘Very Good’ and ‘Fair’ more or less balancing each other. The ‘Poor’ grade was given sparsely

b) Some issues are definitely more important than others, e.g. the quality of the website seems to be unimportant; it has by far the most ‘No Reply’ entries. We conclude that also in our age of electronics, the personal contact cannot easily be replaced.

c) The above finding is corroborated by the fact that the headings 1., 2a., 2b., have the lowest ‘No Reply’ entries: All three, too, deal with personal communication.

d) If, as was implicitly done in b.) and c.), we take the relative amount of the ‘No Reply’ entries as a measure of the importance of this particular heading for the customer, we can see, where SUESSEN has the largest need to improve, namely for the items collected under heading 1, particularly in the sub-heading: Availability/delivery times.

To come around full turn, so to speak, it must be emphasized that this article and the conclusions drawn are for the supplier’s point of view! As we saw before, customer and supplier do not always agree in their opinions.

We therefore invite and request you, our customers, to please give us your comments on this article.

Let us conclude by thanking all those customers and individuals, who took the time to respond to our questionnaire. Their responses and comments will help us to become a better supplier.

![Fig. 2](image-url)
New ASC-Homepage:
www.americansuessen.com

For several months American Suessen Corporation (ASC) has been constructing a website specifically for ASC and the US-American Market, independent from the official SUESSEN homepage (www.suessen.com), but still closely associated with it.

While the US textile market has shrunk considerably the past several years, the remaining spinning companies are stable and have tremendous capacities. The new ASC-webpage offers a more efficient means for them to find the offerings and increase the amount of ASC business.

Therefore, within the new website, the most important area are the pages showing pictures of all the parts offered by ASC. Here the customers have different opportunities to find what they are looking for: visually by pictures, search by description or individual part number.

10 Years SUESSEN
EliTe®Compact Spinning

Here again is a real milestone in the long history of SUESSEN’s successful contributions to the world of spinning technology:

In 1998, just ten years ago, SUESSEN delivered the first EliTe®Compact Spinning Systems to the Austrian customer Linz Textil. Thanks to him, and thanks to all of the many other customers, SUESSEN is now the leader in compact spinning technology with more than 2,800,000 EliTe® and EliTwist® Spinning Positions running in the world.

Other markers in the history of EliTe®Compact Spinning:
- 09/2005 – 1,000,000th EliTe®Compact Spindle to EJAZ SPINNING MILLS, Pakistan
- 04/2006 – 1,500,000th EliTe®Compact Spindle to Super Spinning Mills Ltd., India
- 03/2007 – 2,000,000th EliTe®Compact Spindle to MATESA Tekstil A.Ş., Turkey
- 09/2007 – 1,000,000th EliTe®Compact Spindle into the Indian market to GTN Textiles Group

This might be a reason to celebrate, but much more it is a reason to strive even harder to continue to earn the trust of the customers!

The world renowned South India Textile Research Association (SITRA), located in Coimbatore, South India, has acquired some EliTe®/EliTwist® modernizations from SUESSEN, to further strengthen their excellent research capacities. Amongst the many scientific publications of SITRA is “An Investigation on the Performance of EliTwist Yarn During High Speed Weaving and Properties of Fabrics Made Therefrom.” SUESSEN is very proud to be associated with this prestigious Research Institute.
Product range:

01 Card Clothings for Flat Cards and products for Short Staple Spinning
02 Service Machines for Flat Cards
03 Card Clothings for Roller Cards
04 Service Machines for Roller Cards
05 Clothings for Raising Machines

01 梳棉机针布与短纤 纺纱产品
02 梳棉机包磨工具
03 罗拉梳理机针布
04 罗拉梳理机包磨工具
05 起绒机 针布
Compact Ring Spinning

EliTe® CompactSet V5
Modernization of ring spinning machines

EliTwist®
Two-Ply Compact Yarn directly from the ring spinning machine

EliCoreTwist®
Two-Ply Compact Yarn with Core Yarn directly from the ring spinning machine

Optional Applications: EliVario, EliVAControl

Conventional Ring Spinning

HP Drafting Systems and Spinning Components

HP-GX 3010 Top Weighting Arm— for short staple spinning
HP-GX 4010 Top Weighting Arm— for roving frames
HP-GX 5010 Top Weighting Arm— forworsted spinning
with top rollers, cradles, bottom rollers, bottom apron nose bars

Customers buying new ring spinning machines or roving frames may specify these components directly with the machine maker

COREflex®— core yarn attachment for conventional and compact ring spinning machines

ACP Quality Package— Active Cradle with special PinSpacer

ACP Solutions available for Top Weighting Arms HP-A 310/320, HP-GX 3010, PK-type and P3.1 in compact and conventional ring spinning

Open-End Rotor Spinning

Open-End SpinBoxes
for OEMs Rieter and Savio

Premium Parts— Modernization

SC/ SQ SpinBoxes for Autocoro rotor spinning machines

Premium Parts— Packages

Modernization Packages for Autocoro rotor spinning machines

Premium Parts— Components

Spinning Components for Autocoro rotor spinning machines

Premium Parts— Parts

Spare Parts for SpinBoxes SE 7-10/ SC/ SQ

Testing Equipment

Microdust Trash Analyser MDTA 3— Fibre dust and trash testing equipment

QuickSpin Unit— Prediction of yarn properties

QuickSpin System— Combination of MDTA 3 and QuickSpin Unit

…market oriented solutions…

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