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"Put your jeans always on"

Interview with Fritz Legler, Vice President Marketing, Sales & Service, Stäubli

 Interview with Thomas Gries, Institute Director ITA and Stefan Schlichter, Managing Director ITA Augsburg
Interview with Paolo Gnutti, R&D Head of ITV DENIM

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From the editor

Dear Reader,

Summer and holidays are over in the northern hemisphere. We're back at work and paradoxically the really "hot period" now begins. In other words, the so-called year-end rally to achieve the company's set goals. Up until now 2016 has been a strong year in many textile sectors, and moreover it also seems to have been a year of innovation. Proof of this are the many successful collections, as well as the process changes along the textile value chain.

In this issue we want to have a closer look at the innovations in the denim textile sector. This is a highly fascinating sector which combines a great deal of tradition with innovation, and is always able to react quickly to trends and changes in the market. Only a few years ago denim seemed to be losing status and significance among consumers, but recently it's started to look good again. This is what the Munich Fabric Start announced in August 2016 in its show catalogue, giving an idea of what to expect from the fair.

It will also certainly be very exciting to see how China and Asia react to the large success of ITMA in Milan last year. The rush of visitors there showed that textile companies are extremely interested in modernising their production and making it more sustainable. And it is actually China's own great objective to transform the country's industry and to implement green technologies. On 3 September at the G20 Summit, China and the USA very much surprised the United Nations by delivering documents stating their acceptance of the Paris Climate Agreement – a crucial step for the agreement to completely come into effect. This should suit ITMA Asia + CITME nicely. For the first time it is going to be held at the new, futuristic exhibition grounds in Hongqiao and that could be the final touch for creating a legendary event. Our preview will surely whet your appetite.



Furthermore, we are proud to again be able to showcase interesting and exclusive interviews in this issue. Very fitting for our denim special, Mr. Paolo Gnutti, Head of R&D at ITV Denim, one of the world's leading denim mills from Italy, answers current questions regarding the sector and his company. Denim is also a subject for one of the most well-known manufacturers of weaving machines, Stäubli. Indeed, Stäubli has a lot of news and Vice President Fritz Legler tells us about it in this issue.

This time our country focus is on Pakistan. Pakistan is one of the largest textile countries in the world, but is sometimes slightly overshadowed by China and India. Quite unjustly in our view, since Pakistan has much to offer and a very innovative textile industry. Please recommend us to your colleagues and business partners, and do not hesitate to give us your highly esteemed feedback. Contact us, as always at: editorial@texdata.com.

We wish you successful business and an enjoyable time!

Best regards Oliver Schmidt

10.000

Kilograms move the cranes installed in our new production and assembly hall which is equipped with plenty of groundbreaking technology. In this modern facility we have started to manufacture our Krantz Syncro shrink dryer and Krantz K30 stenter frame. This major investment is our answer to serve the growing demand for these best-of-class machines even more effectively and to respond very fast to all customer requests. This represents our commitment to offer the best service to our customers worldwide, at any time.

We would gladly like to give you more details of our well-engineered machines and parts. Please contact us.

Machine programme and contact information under: www.interspare.com







Still the peak in finishing machinery.

"Put your jeans always on"

How the denim industry aspires to attract new customers and new markets

ince their emergence in 1873, denim jeans have gone from strength to strength, and have been a staple item of clothing in the wardrobes of millions of people for the last several decades. Consistent they are not, however, having undergone numerous changes in their cut, colour, fit and material and the textile manufacturing processes used to create them in order to adapt to suit new consumer demands, the fluctuating prices of raw materials and, above all, new ideas put forward by designers. The production of denim clothing is, of course, also subject to the overall developments in textile manufacturing. Such developments include boosting productivity at the same time as increasing wages, greater flexibility, more automated processes, the mega trends of "fast fashion" and the desire to improve sustainability. The global denim clothing market is estimated to be worth between 55-70 billion US\$, and its size alone quickly makes clear how important it is for all market participants continuously to identify and implement new innovations so as to preserve, or even strengthen his or her position in the market. Modern, expertly configured and highly productive machinery is absolutely essential in being able to hol down a position at the forefront of the industry. In terms of sustainable production, gaining such a position requires processes to be scrutinised constantly, and to be replaced by updated and more sustainable practices.

We would like to take a brief look at a few recent innovations.

Let us start with a few essential basics. Traditionally, denim is made of 100% cotton yarn, which is coloured with indigo to make warp yarn and then woven together with undyed weft yarn to make a cloth. 3×1 right hand weaving is the most common in selvedge denim, chiefly because any denim over a 10.5 Oz. per square yard weight is 3×1 .

There are ever more deviations away from this tradition that ultimately change the final product. During the 60s, teenagers would take a bath in their jeans so as to shrink them for a perfect fit; this was followed by flares and skinny jeans, then by pre-washed trousers, ripped designer jeans and, finally, labour-intensive used-look jeans. Of today's styles it can be said that, to begin with, every possible procedure that refines the textile is implemented, so that it can be at least partly destroyed again further along the production line.

Proven success.

The Monforts range combinations for denim finishing are now even more cost-efficient and eco-friendly: The Monforts ECOApplicator is now used for liquor application.

Drying, stretching and skewing functions for the denim fabric are performed by a modified Thermex-Thermo-Stretch unit. This configuration allows fabric speeds of up to 40 m/min to be achieved with 14.5 oz/yd² denim on the "single rubber" version.

The "double rubber" version comprises two compressive shrinkage units and two felt calenders in line. Together with the innovative Thermex stretching unit, fabric speeds of up to 80 m/min can thus be achieved with 14.5 oz/yd² denim.

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On both range versions, the denim fabric is stretched and skewed far more gently than with conventional range combinations. Ask our denim technologists. We will be happy to advise you.

A. Monforts Textilmaschinen GmbH & Co. KG Germany | A Member of CHTC Fong's Industries WWW.MONFORTS.COM



THINKING AHEAD for sustainable solutions

ITMA ASIA Hall 6. CO1

GERMAN **Technology**





Denim Première Vision Photo (c) Denim Première Vision

Amsterdam Denim Days PHOTO © 2016 TEAM PETER STIGTER

Beyond Denim Photo © Messe Frankfurt

These days even the consumer themselves can alter or personalise their jeans. Our modern lifestyle is both crazy and omnipresent, which, when combined with such a large market, offers plenty of room for ideas and new directions. With every new direction, new trends are set and the spectrum widened, so that for every target group there is an appropriate range.

Danger arises for the denim industry whenever the competition is not between trends and collections of the different denim clothing, but denim in general is losing market share in the apparel. This calls for large-scale adaptations. Competition can nevertheless stimulate business, and the same applies in the denim industry.

Denim lost market share

A few years ago, denim clothing gained new competition in the USA, in particular from sportswear and activewear. Cotton Incorporated wrote on the subject in an insight article 'Driving demand for Denim Jeans': "Despite high consumer favor, jeans have lost a significant amount of retail floor space to other bottomswear items like dresses and athletic pants, according to Cotton Incorporated's Retail Monitor[™] Survey. The popularity of women's dresses has increased in the past five years, while athleticwear's presence at retail has grown, in recent years, due to its popularity as a multifunctional apparel item among men and women." The article is pointing to poor quality and performance as particular problems.

It says: "Consumers are more than twice as likely to rate denim jeans negatively if they experience pilling, itching, or durability issues. While durability issues may be linked to improper textile processing, pilling and itching issues may be the result of blending synthetic fibers into jeans." What Cotton Incorporated with cotton in its name must see as a problem appeared to many others to be a solution - the combination of cotton and synthetic fibres in blends.

The answer: new yarns

Such cotton blends with nylon, polyester or polypropylene ought to help improve the performance of pure cotton denim by, for example, improving abrasion, thus also enhancing durability. Other blends with cupro, Modal, Tencel and rayon were created with softness in mind, and to achieve a smoother sensation next to the skin. Further blends with bamboo or hemp fibres also exist. Factors like softness and wearing comfort also depend on the type of yarn (OE or ring) used or on the type of finishing process.

Other improvements can also affect the fit and wearing comfort, even when in competition against sports clothes, and are to some extent more radical. The aim here is not just quality, but also adapting the benefits of other types of clothing. Stretch denim is a prime example of this, which combines cotton with elastane as its core yarn. Lycra or Spandex is used as the elasticated material, which provide extremely good stretchability with just a small proportion of the overall material (around 5%). Taking a look at the collections of leading denim cloth manufacturers at major industry events such as Denim Premiere Vision, the BLUEZONE at the Munich Fabric Start trade fair, the Beyond Denim Zone at the Intertextile Shanghai Apparel Fabrics fair, or even at the Kingpins Amsterdam Denim fair, it is easy to see that, as it used to be defined, denim is just one part of a range of products. Nowadays, these collections reflect an enormous range of choice. They haven't just incorporated individual trends and mixed them up like a proficient DJ - they also love to include new ideas and want to take the next steps. The industry has discovered new paths to tread, which it will continue to follow in the future, joining them together as it goes.

Stretch. Shape. Fit. Lightness. Softness. Colour. Applications. Extravagance. Look. Individuality. Added value. One might get the impression that the industry wants to pay back the attack on its share of the leisure clothing market - with interest. Denim is meant to be comfortable enough that you wear it round the house, boast the style factor of a trendy sport dress and even conquer the lofty world of business attire when combined with finest quality wool.



Denim Première Vision Photo (c) Denim Première Vision



BLUEZONE at MUNICHFABRICSTART Photo © MUNICHFABRICSTART



BLUEZONE at MUNICHFABRICSTART Photo © MUNICHFABRICSTART

"Anybody who wears sweatpants has lost control over their life" the fashion guru Karl Lagerfeld once said, but perhaps even he would be a convert to denim jeggings?

Moreover, all of this goes hand in hand with a commitment to sustainability. The denim industry aims to leave the old problems of cotton and dying processes behind and become a modern-day trailblazer. One example. At the 17th Denim Premiére Vision exhibition in Barcelona in 2016, in an open forum, Chantel Malingrey, Director of Premiére Vision, set out the aims of the new Smart Creation initiative. She said: "We want to allow industrialists to make the most of a new added-value - that of responsible production and creation. The denim industry is truly a centre for innovation and creative research. It is also one of the most advanced and daring in terms of responsible production, especially in the upstream branch represented at DenimPremiére Vision. The Smart Creation initiative wants to communicate, among other things, traceability of sourcing for raw materials and transparency in terms of production, energy use, waste, water management and social policies".

Statistic Brain puts the number of denim mills worldwide at 513, which produce around 2,700 million metres of denim every year. Roughly 80 companies presented their collections at BLUEZONE in the Munich Fabric Start fair in August, more or less representing the spearhead of innovation. What are the others doing now? If the range diversifies at a similar pace, and the mainstream increasingly follows the fashion of the day, the market for classic denim with little added value will likely become smaller.



,360 degree' denims by Zara and Orta © Photo Orta



Going nostalgic: Iconic Pinto Denim by Cone Denim / © Photo Cone Denim



ISKO ARQUAS[™] innovative activewear collection © Photo ISKO



ITV Denim Collection at MFS © Photo ITV Denim

This means keeping pace with the big players in the industry.

Let's take a closer look at one of the big trends. DenimPremiereVisione writes in its trend article "Full stretch: the '360 degree' denims": "New advanced technologies make it possible to create jeans that smoothly follow all movements of the body. [..] More and more of today's jeans come in supple, flexible and lighter qualities.

They offer a second-skin sensation thanks to the use of fabrics that effortlessly follow the movements of the body while remaining a perfect shape, all day long."

Challenges in denim yarn production

It is only logical that the invention of new yarns would require frequent changes to the textile manufacturing process, the corollary of which is that new machines will often better be able to meet difficult or specific challenges than outdated machinery. A recent example of this is the production of dual-core yarns, which are currently very much in-vogue. In contrast to core yarns, dual core yarns consist of three components: for eample an elastic polyurethane filament such as Lycra®, creora® or INVIYA® I-300, a multifilament such as Lycra® T400® and the sheath material of staple fibres, mainly cotton. They are spun in suitable counts.

The multifilament gives the yarn some interesting advantages which makes it interesting also for denim applications. Let's have a look on T400 to understand these advantages. Lycra writes on their website: LYCRA® T400® fiber is a multi-component yarn in which different polymers are joined together within each filament. When exposed to heat, each polymer shrinks to a different degree, producing a smooth helical crimp. Because the crimp is not mechanically induced, LYCRA® T400® fiber gives greater, more durable stretch and recovery, and a softer, smoother hand than textured yarns that are used for stretch. The unique structure of LYCRA® T400® fiber also provides the added benefit of good moisture management to help wearers feel cool and dry."

As far back as 2014, Saurer Schlafhorst pointed to the splice process for winding as a particular challenge for new yarns and emphasised the benefits of its new winder Autoconer X5: "The complex yarn structure presents a particular challenge to the splicing process when winding.

The staple fibre sheath on the dual core yarn is proportionately much thinner than for single core yarns, for example 70:30 instead of 95:5. A good spliced joint is only obtained if the elastic core does not spring back when cut and the filaments are once again uniformly sheathed by the staple fibres following splicing. Here the Autoconer can play optimally to its strengths in splicing. The dual core spliced joints on the Autoconer X5 produce a joint that is identical to the yarn. They have the same elasticity as the yarn, as both filaments can be joined reliably to one another. They are visually inconspicuous, as the sheath fibres securely cover the filament core. Uniform dyeing of the yarn with the resulting top quality of the final article is assured, as are maximum efficiency and processing reliability in warping and weaving." The new Autoconer 6, which was presented at ITMA 2015, honed the process even further.

Another significant and persistent trend is for improving the softness of denim fabric. Blends with, for example, hemp or Tencel, lend themselves to fulfilling this challenge too. Another possibility - which may even please cotton purists - is to use fabric made of combed yarns, which are much softer than carded yarns. Given the large amount of effort required, however, and the fact that around 15% of the raw cotton is written off by combing, this method is somewhat more expensive. This is exactly where innovative machinery can lend a helping hand. The Toyota-Truetzschler TCO 12 combing machine is the perfect symbiosis of Toyota combing knowhow and Truetzschler draw frame technology and sets new technological standards.

And it also stands for consistently highest and reproducible qualities even at high production rates. With the TCO 12A, fully automatic operation in combing is possible for the first time. In Addition Toyota-Truetzschler combing allows the selection of larger, and thus more economical can formats up to 1,200 mm diameter which results in a significantly higher efficiency in newly designed installations.



Toyota Trützschler TCO 12A



Saurer Schlafhorst Autoconer 6



Itema Rapier 9500p

This is just one such example. Every innovation will benefit the spinning of denim yarn: this applies for yarn spinning as a whole, from the start of the process in the blowroom right up to twisting. True innovations are a matter of priority for larger suppliers such as Trützschler, Saurer, Savio, Marzoli, Rieter and Uster, who consistently manage to increase the productivity of their machines and further to improve individual components, or to find new ways of meeting current demands. The potential importance of these innovations is demonstrated by numerous examples of innovations in machinery, which boast an increase in productivity of 20% or more. In the best case scenario, this equates to access into new market segments, margin increases of 20% and thus a quicker return on investment. For further innovations in yarn production, we refer to respective articles in, for example, our ITMA 2015 review.

Improvements of the weaving processes for denim fabrics

In weaving, however, the outlook is somewhat different, since several innovations were presented at ITMA that were specifically developed for weaving denim fabric, or at least were presented in relation to weaving such fabrics. As is well known, all four kinds of weaving machines - projectile, rapier, air-jet and shuttle looms - can be used for weaving denim. But what about the numerous new types of yarn? Their introduction increases the demands on weaving, while modern machines configured expertly for the specific requirements of a particular yarn also offer the opportunity to create top-quality materials while maintaining excellent productivity.

Let's have a look on the leading manufacturers of weaving machines. Itema from Italy claims denim weaving their biggest market segment. The company offers a projectile, rapier and air-jet weaving machine especially for denim and has customers all over the world. The current machines for denim weaving are the P7300HP projectile, the R9500 rapier and the A9500 air-jet weaving machine. The P7300HP is ideal for heavy denim (>14 oz.) and stands for great value for money. It has a very long life span and comes with a top reliability, functionality and ease of operation. Furthermore it offers the lowest waste among all insertion technologies. The R9500 offers the highest versatility for the full range of Denim fabrics. It stands for the most advanced technology and a high quality of the fabrics.

Itema demonstrated a latest solution on the ITM fair in Istanbul showing the Rapier R9500p with a width of 220cm weaving a Super Stretch Denim. And last but not least the air-jet A9500 offers the highest speed and productivity of all three insertion systems.

Picanol celebrated in 2015 40 years of manufacturing rapier weaving machines with the global launch of its new OptiMax-i and TerryMax-i machines. At ITMA 2015 the weaving machinery manufacturer from Belgium presented an OptiMax-i (4 – R - 190) weaving a fancy denim.



Stäubli's automatic drawing-in machine, the SAFIR S40, proves that even the preparations for weaving can have a significant impact on the productivity of denim weaving. Main reasons why mills that weave denim should use automatic drawing in are to scale down the production costs, to shorten down time of the weaving machines and to increase the fabric quality. With an automatic drawing-in machine, one person can draw-in up to 10 warps per shift without any errors. A perfectly drawn-in weaving harness improves the operational performance of every individual weaving machine and reduces the time needed for correcting errors. Let' s have a closer look. The error-free drawing in of denim yarns in the weaving harness drastically reduces production downtime, thereby increasing the actual production time and output. And there is less second-quality production: A perfectly drawn-in harness prevents double threads and the resulting deflected warp threads at the weaving machine.

In addition quick style changes allow greater agility in the market, short delivery times and quick reaction to changing market conditions; this strengthens customer bonding by allowing a more attractive product range. And with automatic drawing in it is also possible to expand the textile portfolio by developing new weave patterns using the mill's current machinery.

The SAFIR S40 is designed as a mobile drawing-in system. In an optimal setup, the machine commutes between 1 or 2 stationary drawing in stations, where the warps to be drawn in are stretched.



While drawing in is being done at the first station, the next warp sheet is being prepared at the second station, so that the drawing-in machine is constantly in productive use. The modular design of the system allows the mill to gradually expand its drawing-in capacity as changing needs dictate. All these advantages make the SAFIR S40 the perfect solution of automatic drawing in of Denim fabrics.

Other machines designed especially for preparing denim for weaving include the WARPDIRECT beam warping machine and the LONG CHAIN BEAMER for ensuring a superior yarn opening performance created by the firm Karl Mayer. This market leader in warp knitting also boasts an outstanding portfolio of weaving preparation machinery.



Karl Mayer WARPDIRECT

Knitted denim?

The knitting machine manufacturer Stoll takes an interesting approach by producing indigo-dyed cotton-yarn knitwear that resembles denim fabric. The company released a "Trend Collection" for both the Spring/Summer and Autumn/Winter seasons in 2014. These had little to do with jeans as we know them, but embodied the logical continuation of the expansion of the industry. And the collections went down well with the market, as was demonstrated at the large denim trade fairs. Many brands and denim fabric producers incorporated knitted denim into their collections.

Now for some very recent news. In August 2016, during BLUE ZONE International Denim Trade Fair in Munich, four leading supply chain companies further enhanced the idea of innovative knit denim as a counterpoint to the traditional woven denim fabric and launched DEN/IM. This stretch indigo denim concept brings new innovation to the athleisurewear. In co-operation with Lenzing, Unitin and Tonello – Santoni sensed an opportunity within this market orientation and have created



Stoll sample of a knitted denim / © Photo Stoll

new stretch denim products using their class-leading seamless circular knitting machines. "This indigobased concept, not seen previously on seamless garments, fits perfectly into this rapidly evolving life-style concept. Furthermore the traditional denim market can benefit from the " just in time " production and semifinished garments tailored for the fast changing fashion world needs," said Patrick Silva, Santoni Marketing Manager during the presentation. The brandnew SANTONI machine SM8/EVO4J GG20 has been used for developing a new complete total look capsule collection that offers body hugging, comfortable, sporty, chic and trendy denim items from head to toe.

The genuine DNA of denim is maintained with contributions from Lenzing, Unitin and Tonello. "We are always looking to the future when thinking about embedding TENCEL ® fiber further into the denim market explained Michael Kininmonth, Business Development Manager for Lenzing, the reasons for the coorperation. A great attention has been given to environmental aspects from the class-leading manmade cellulosic fiber in TENCEL (R) to the low-impact finishes developed by Tonello, such as laser and ozone. In addition, SANTONI, with its " Green Label " seamless technology, guarantees to have fewer machines involved in the production flow chart, lower energy costs, smaller machine footprint and a shorter production process.

New possibilities for dyeing of denim

Let's move on to the dying process. In recent years this aspect has seen great, perhaps even the greatest, efforts made to change and incorporate new processes. It is common knowledge that

dying with indigo requires the use of chemistry and also necessitates a large amount of water. As part of efforts towards increased sustainability, many companies have proposed new processes for dying denim which do the job in a more environmentally-friendly manner. Some of these processes have already been integrated for several years and need to be either expanded or improved. Let's take a quick look at some of these. For pretreatment Archroma offers its Blue Magic bleaching system and CHT/BEZEMA the Vario Bleach 3E.



DEN/IM, an innovative knit denim Photo © Santoni



ITV Denim knitted sweater in the BLUEZONE of MUNICHFABRICSTART / Photo © MUNICHFABRICSTART

From low temperature bleach up to quality improvement in the HT bleach – with VARIO BLEACH 3E nearly all discontinuous bleaching processes can be diversified in a simple and inexpensive way. The secret of VARIO BLEACH 3E lies in the combination of innovative booster technology and special comb polymers. It offers economic and ecological advantages due to shorter process times, water and energy savings.

Since 2009, Archroma offers two breakthrough eco-advanced dyeing processes under its ADVANCED DENIM concept: the Denim-Ox and the Pad/Sizing-Ox processes. Archroma says that in an unlimited range of tones and shades with superior color fastness, denim retains the traditional jeans look people love but comes with a wealth of additional features that set it apart

from conventional indigo-dyed fabrics. The ADVANCED DENIM concept did not use Indigo. It uses a range of pre-reduced sulfur dyes with minimal sulfide content named Diresul® RDT. Apart from eliminating hydrosulfite in the dyeing process, it makes manufacturers more versatile by offering them the choice of solid or ring denim and a wider range of blues and navies, blacks and grays. And the process allows to use peroxide-based wash-downs in stead of using chlorine and permanganates. Archroma says that ADVANCED DENIM, compared to a conventional denim dyeing process, allows savings up to 92% in water, 87% in cotton waste and 30% in energy. The ADVANCED DENIM technology was honored with the prestigious 2012 ICIS Innovation Award and Innovation with Best Environmental Benefit Award. Of course Archroma goes on to develep new colors within the ADVANCED DENIM concept. In May 2016, at Denim Première Vision, they have debut solutions for brilliant blues.

DyStar has introduced and patented its Denim Package Indigo VAT 40% Solution already in 2004. This state-of-the-art in pre-reduced Indigo liquid allows a cleaner denim production and a reduction of the Sodium Hydrosulfite usage by 60%-70%. The solution is used for example at all Arvind Denim Manufacturing facilities Arvind announced in 2013. DyStar also offers coatings for different blues and Lava® chemicals for fashionable wash effects. At interdye 2016 DyStar presents coatings for different blues and Lava® chemicals for fashionable wash effects in addition to DyStar Indigo Vat 40%.

Huntsman recently relaunched the AVITERA SE Range of reactive dyes for Cotton fibers adding six new dyes in the range. AVITERA SE is designed to reduce water usage in dyeing by 50 percent and more and reduces Co2 emissions by up to 50 percent. With the additional products, AVITERA can cover all of color space including bright, brilliant shades and blacks. AVITERA SE was the Overall Winner of the 2014 ICIS Innovation Awards recognized for the best benefit to the Environment Award.



Jeans dyed with Archroma's ADVANCED DENIM concept Photo © Archroma

Festival in Blue' with DyStar's Indigo VAT 40% solution / Photo O DyStar

A large number of these processes try to carry out the dying process using materials taken straight from nature, or with the smallest degree of chemical interference as possible.

Once again Archroma introduced their nature-inspired clothing colors with full traceability EarthColors in November 2014. These high-performance dyes are synthesized from non-edible natural products such as almond shells, saw palmetto or rosemary leaves that otherwise would be sent to landfill. EarthColors, available exclusively to eco-conscious fashion brand owners, is the chemical company's patented new method of creating warm ternary shades from nature.

They can be used to provide rich red, brown and green colors to cotton and cellulose-based fabrics denim and casualwear. The new dyes have been four years in the making.

They have the overall performance of the company's existing range of sulfur dyes made from conventional raw materials. Archroma describes this new development as a step-change in dyes manufacturing and coloration technology. The new EarthColors* range is produced near Barcelona, Spain, with all raw materials sourced from within a radius of 500 km. EarthColors range of nature-inspired dyes has been named to the shortlist of entries being considered for a 2015 Innovation Award by ICIS Chemical Business magazine. Archroma presented together with Tonello a range of T-shirts dyed using Earthcolors in May 2016 at DenimPremiereVision.

Furthermore Archroma has answered on a direct question by TexData that their R&D is currently working on developing a specific Earthcolors blue dyestuff for use together with their Archroma's Advanced Denim dyeing technology, aiming for maximized ecological benefits. At this stage, Archroma can already offer a blueish grey shade, the Diresul® Earth-Stone, which they developed by combining 70% agricultural waste biomass with a compatible oil-based raw material, and which they synthesize using the EarthColors technology. This already represents a great alternative compared to conventional pure synthetic dyes. A collection of jeans made using this solution was also presented at Denim Premiere Vision in May 2016. Archroma is seeing very strong interest from the denim community for their new 'blue color solutions'.

In April 2015 ORTA introduced VEGAN Denim and stated that this is the first collection of denim fabrics ever to be produced exclusively with vegetable and natural dyestuff at an industrial scale. They wrote that the art of dyeing is as old as human civilization. Man learnt to use different kinds of natural coloring agents to dye cloths. The major obstacle for dyeing fabric with natural dyestuff has been the difficulty in producing good color intensity and shade consistency. This problem was due to the vegetal dyestuff's lack of efficacy when applied to cotton.

ORTA has developed a new dyeing technique that thoroughly overcomes the problems of affinity and consistency. As a result of long-term research and study, this technology ensures an increase in affinity of dyestuff to cotton. The results show greater stability and consistency in dyeing. Thanks to the VEGAN methodology, it is easy to obtain intense shades in both vegetal indigo and natural colors. ORTA VEGAN Denim complies with global standards and is highly sustainable. A responsible product, it uses less water, less energy and fewer chemicals than conventional dyeing methods. ORTA has obtained a legal patent for the process and it is subsidized by European Union Research Funds.

This sounds like an outstanding solution. A product video demonstrates, however, that the item can only be hand-washed, and should not be washed together with other items of clothing. Getting this message through to the consumer is no easy task.

Already in 2012 ITV Denim, known for its commitment to innovation, has partnered with INVISTA and ECOYAA to produce a new range of denim fabrics that uses wine and its derivatives to achieve color.







Archroma Jeans in a blueish grey shade, dyed with Diresul® Earth-Stone © Photo Archroma

Archroma Earth Colors © Photo Archroma

Denim jeans dyed with 'Vegan Denim' by ORTA ANADOLU © Photo ORTA ANADOLU

Wine-Tex' by ITV Denim © Photo ITV Denim

The new process replaces traditional synthetic indigo dyes with wine derivatives, resulting in a wide range of blue colours for dyeing yarn, fabric, and ready-made garments. ITV acquired a worldwide, exclusive patent on this process from ECOYAA, a Korean company specialising in natural dyeing.

The agreement also enables ITV Denim to distribute and market the products based on the ECOYAA patent under the WINE-TEX® brand. Backed by a cutting edge research laboratory and years of experience in the field, ITV Denim is developing a wide range of products and processes using the new technology at its Abruzzo base in Cellino Attanasio, in Teramo province. In addition to an exciting selection of fabrics, the company is also offering denim garments that take full advantage of the WINE-TEX® features and performance. Many of the samples ITV has made incorporate branded INVISTA fibres and technologies with the WINE-TEX® process.

ITV decided to work with INVISTA on this project because its offerings such as LYCRA® fibre, LYCRA® T400® fibre, and LYCRA® dualFX[™] fabric technology are widely used in the denim industry. Thus, it was important to demonstrate the compatibility of the new WINE-TEX® technology with other high quality ingredients and processes.

And what if it has to be indigo? The Swiss firm Sedo Engineering, the sister company of the better-known German company Sedo Treepoint, presented a method at ITMA 2015 that incorporates economic and environmental aspects of the indigo dying process.

The company proudly announced that their Smart-Indigo[™] revolutionizes the dyeing process for denim and calls it a global innovation! Smart-Indigo opens up the industrial production of leuco-indigo on the basis of electrochemical reduction for the first time. How does it function? Indigo is water-insoluble. So for the multi-step dyeing process it needs to be converted to water-soluble leuco-indigo. Sedo Engineering writes: "Whoever is familiar with the process knows that the current manufacture of leuco-indigo presents significant environmental problems and risks from handling chemicals because of the chemical reduction process, especially for suppliers and dyeworks. This is counterproductive and puts a shadow over the internationally beloved blue jeans."

After much research and development, Sedo Engineering has succeed in developing a solution for revolutionizing the leuco-indigo manufacturing using a new "electrochemical reduction" process.

This new approach is based on an ingenious discovery made by the Swiss David Crettenand. He found a way to use an electrical charge for manufacturing leuco-indigo more easily and smarter by using an electrochemical procedure. Smart-Indigo[™] is now a patented electrochemical procedure by Sedo Engineering ready for marketing. The three-dimensional electrode process produces "smarter leuco-indigo" simply with indigo powder, soda, and water. The automated procedure has been proven to be significantly cleaner and more environmentally friendly than all other production methods to date. Furthermore the new process offers simple "on-site production". While the leuco-indigo that is used for dyeing denim fabric at dyeworks today is often manufactured and delivered by suppliers the Sedo Engineering's Smart-Indigo[™] system is better done on-site.



That means that long distances for transportation and the ensuing high costs are eliminated. The new electrochemical process for manufacturing "smart leuco-indigo" is impressive because of its clear ecological advantages as well as its efficiency and profitably.

Since Middle of February 2016 the premium denim manufacturer ITALDENIM is using exclusively the Smart-IndigoTM in their production. Sedo wants to reach leuco-indigo suppliers as well as denim dyeworks, brand name clothes and jeans manufacturers of all sorts.

What's more, Sedo Treepoint offers further interesting solutions for the denim industry.

Morapex® is a powerful instrument that provides rapid material testing by collecting an extraction liquid under controlled pressure and temperature from the test material. Particularly in the denim industry Morapex® can be widely used both in denim fabric production and in garment processing. The main applications areas related to the denim industry are pH fabric control, test of the washing fastness, sizing or desizing analysis, check of the degree of fixation ratio for resin applications and trace analysis of all types of harmful materials (e.g. Formaldehyde, Chlorine). Let' s have a closer look to pH fabric control becuase it is one of the main applications for Morapex® and is extremely important for denim fabrics. This is due to the fact that the majority of denim fabrics produced nowadays, especially for high end markets, are mercerized or caustisized during dyeing and finishing processes.

Variations in the neutralization process greatly influence fabric appearance and properties. As an example, stretch denim fabrics which have been poorly neutralized often show yellowish backstaining after final drying processes. Morapex® is the only direct and rapid method for analyzing and controlling fabric pH at various production stages.

Previously, the analytical laboratory needed several hours to complete the test and results were not reproducible. Morapex® provides results within minutes and with superb reproducibility. In addition it can be used for optimizing and "fine tuning" the neutralization processes, avoiding excessive use of acids which reduces the environmental impact in a more sustainable way. Another product is Flex. It controls the dyebath by spectrophotometric analysis. Consisting of a highly precise spectrophotometer and automatic dilution system it can be used alongside existing potentiometric methods to give better dyebath control thus reducing offshade production. Using Flex in the production situations increases right first time production and increased competitiveness for the denim producer.

There are even possible solutions for dying with indigo that place emphasis on improving sustainability. The PRODYE by Karl Mayer, for example, offers a complete machine for weaving preparation. PRODYE is the perfect solution combined with the best technology for indigo dye. It offers Double Vario, ECO-Wash and a quick oxidation.

Mills benefit from a darker indigo shade, a reduction in water consumption and waste yarn, a double productivity in the case of lightweight denim, 25 % less dye bath, a drastic reduction in % of second choice and an easier repair of broken ends and facilitated cleaning. The reduction in water consumption is up to 30 %.

The maximum beam creel diameter flanges are 800, 1000, 1250 and 1400mm, the working width 1800-2200 mm and the maximum speed 50 m/min.



Karl Mayer PRODYE

Countless sustainable options for fabric and textile finishing

Next, we come on to the finishing machines for making textiles and clothing. Here, too, great efforts have been made in recent years to make environmentally harmful techniques more sustainable and thus more ecofriendly. The aim here is clear: use less water, less or if possible no chemical products, and consume far less energy. The best known example is surely bleaching with the help of bleaching agents, which has been replaced by ozone bleach. We would like to begin, though, with textile finishing machines, and specifically with the German textile machine producer, Monforts, which has been producing systems that are optimised for the production of denim for many years. One of their most recent developments is the Matex EcoApplicator. Eco-Applicator has been designed by Monforts to enable the extremely precise application of functional finishes to fabrics and dry them in an extremely efficient and compact single-stage unit. It offers significant energy savings with reduced liquor application. The multifunctional and multi-purpose process ensures the lowest energy input for consecutive drying to its minimal liquor application. It has been developed to apply a liquor to one side of the fabric; to both sides of the fabric; a different liquor to either side of the fabric; or to apply two different liquors consecutively to a single side of the fabric.

Berto Industria Tessile, a leading vertically integrated manufacturer of denim products from Italy, was quick to recognise the economic and ecological advantages of the Matex® Eco Applicator range by Monforts. They were the pioneer in adopting Monforts' innovative technology, which enabled them to significantly reduce the amount of liquid needed in finishing denim fabrics, leading to energy savings and a huge reduction in waste water produced. At ITMA, Berto won the 'Silver ITMA Sustainable Innovation Award' for economical treatment with the integration of Eco Applicator in a Monforts stenter range.

Another company who invested in a Monforts Eco-Applicator is Soorty, a major producer of denim fabric and jeans in Pakistan.



Monforts Eco-Applicator

Soorty is employing some 22,000 people across its operations which are centred around Karachi, and with a new, award-winning garment makingup department and office in Bangladesh, as well as a design studio in Amsterdam. Its denim weaving operations make over 3.5 million metres of fabric each month and between 70 - 80 % of our manufactured denim is being converted into finished pairs of jeans. In order to be most effective, the Eco-Applicator was installed at the end of the finishing line before the sanforizing unit. In addition Soorty has introduced a raft of measures aimed at ensuring it is a world leader in eco-efficiency. This has been proven in a special, in-depth sustainable production study carried out with Archroma. The result has been that the installation of the Eco-Applicator – in combination with the latest high-efficiency Archroma eco-friendly finishing formulations – has made a miraculous difference. It replaces four previous processes, significantly reducing the overall process time to just 40 minutes. Furthermore the plant's energy requirement has been cut by 31% and its water consumption by 50%, compared to competing operations.

Furthermore Monforts has introduced a combined stretching and drying system last year and the denim industry has been very quick to recognise its potential because the drying of denim is extremely energy intensive. The new system can result in savings of up to 60% of the heating energy usually required in the drying process during the single or doublesided coating of such textiles. The key to the new coating system is in reducing the initial moisture content in the material prior to drying.

The system is based on intelligent automation and a design that is a completely new to the market - the coating unit is an integral component of the stenter frame. The largest manufacturer of denim in the world a Turkish company- purchased five of these extremely complex special systems.

Monforts furthermore emphasises its considerable commitment to the denim industry by publishing its own magazine, "World of Denim", the three editions of which have so far focussed on trends and new solutions in the production of denim.

More leading manufacturers of finishing lines offering first class solutions for the finishing of denim fabrics are Brückner and iNTERSPARE. The Brückner POWER-SHRINK Sanforizing line, for example, allows the sanforizing and compacting of very different types of woven fabrics including denim.



Finishing on a sanforizing line gives the fabric a more stable structure, a silky shine, a smooth hand and minimum residual shrinkage values. BRÜCKNER offers single or double sanforizing lines and combinations with felt calenders depending on the product and the customer's requirements.

Mechanical processes are increasingly being used as an alternative to chemical finishing techniques in order to give a fabric particular qualities. At the ITMA Milano the German company matchpoint, well-known for leading diamond finishing technology, presented its new sueding machine diamondTec. End users get the enormous economic and ecological benefits by using the diamondpeach technology at diamondTec sueding machine. diamondTec is ready for the treatment of all woven and stable fabrics, in particular for Denim. The machine creates an even soft touch at front and back sides of fabrics in one process way. In combination with diamondpeach plus it is possible to get the most eaven soft touch at DENIM fabrics by physical treatment. Matchpoint says that this was possible only by a chemical process up to now expects huge benefits for their clients and also for endusers from economical and from environmental care side.

This brings us on to the finishing of clothing. One company that has been setting standards in recent years, and has made many processes more sustainable by introducing innovative technology, is Jeanologia. The Spanish company was founded by Jose Vidal & his nephew Enrique Silla in 1993. Located in Valencia, Barcelona and Turkey Jeanologia is today composed by a team with abroad experience in laser and eco-efficient technologies and a true specialist in sustainable technologies for garment finishing. At ITMA 2015 in Milan Jeanologia made an exclusive presentation of the zero discharge production center, the first Jeans finishing plant that guarantees ZERO®Ø contamination. ZERO®Øtechnology recycles 100% of the water used, eliminating the need for water treatment and also the use of pumice stone.



Using the diamondpeach technology at diamondTec sueding machine © Photo Matchpoint Textilmaschinenbau

Jeanologia underlined that a zero discharge production center could revolutionise the textile industry because, for the first time ever, a Denim treatment plant could achieve ZERO @Ø waste, thanks to the efficient combination of Jeanologia's three technologies: the light of the laser, wet and dry Ozone G2, and the nano bubbles of the reactor eFlow. This identifies three major process changes in garment finishing. They are being introduced for several years and are increasingly establishing themselves.

Laser treatment is an alternative to convential treatments like stone or sand washing and bleaching for achieving faded look and worn-out effects. Laser is excellent for localized effects, but less beneficial for overall bleaching, because it is more expensive than other treatments. In the field of laser Jeanologia offer three differnt systems: TWIN HS, FLEXI e and FLEXI HS 3D. Equipped with 2 laser resonators of maximum power, twin is the most productive and fastest laser in the market. The TWIN has been designed for large productions of 5 pocket jeans. It takes just one operator per working shift to process up to 4000 jeans a day. Each operation is controlled by an artificial vision camera. Flexi E can deliver multiple marking combinations thanks to its rotating head and optical system that allows working either on horizontal or vertical mode. FLEXI HS 3D stands for absolute versatility and higher productivity in one machine. And with Nano, the shop laser, brands can offer fast & easy customization at shops.

Ozone or oxygen bleaching uses the natural bleaching effect of ozone to bleach denim to lighter shades. Jeanologia G2 Cube reproduces ozone gas conditions to give garments the real look of outdoor usage, by using the air from the atmosphere. Its possibilities range from cleaning and anti-back staining to fashion, and vintage effects. And it reproduces same physical and chemical conditions wash after wash, thus standardizing all outcomes.

In the Jeanologia e-Flow technology, air from the atmosphere is transformed into nano-bubbles. Products and water are then naturally distributed and create the nanobubble skin, a perfectly homogeneus mix between water, products and air. The skin of the nano-bubbles is responsible of transporting the properties of the product to the garment in an optimal & efficient way. Applications are softening, resins for 3d effects, easy care wrinkle free and water repellence finishes.



JEANOLOGIA Laser Dynamic

Another innovative product of Jeanologia is Light Scraper. This is a new optical technology that modulates Jeanologia lasers and allows the cloning of worn or scraped looks, and creates authentic virtual slubs on jeans. Thus, with the same fabric, Light Scraper creates open end denim, ring spun denim, crosshatch or slub just by pressing a button.

At Bangladesh Denim Expo in April 2016 Jeanologia presented its latest release, Light PP Spray. With this technology they have managed to eliminate the process of potassium permanganate spraying, replacing the most damaging technique to workers and the environment.

A further well-known example of the modifications made to finishing processes in the clothing production industry is provided by the NoStone® process used by the Italian firm Tonello. Together with Levi Strauss & Co., Tonello won first prize in the ITMA 2015 Sustainable Innovation Award. The NoStone® system is based on a stainless-steel abrasive drum, which is fastened to the washing-machine cylinder.

This drum is specially treated to make it more or less abrasive, depending on the intensity of treatment required, and thus on the effect desired. Due to the mechanical rather than chemical nature of the process, the NoStone® effect is the same as that of stone-wash and almost entirely eliminates the carbon footprint (CFP) of pumice stones. NoStone® was developed to be applied in all Tonello machines, to which it fits perfectly, maintaining the same load capacity. The lining can easily be removed, so the machine can be used for normal washing or dyeing processes. The NoStone® process reduces water consumption, production costs, emissions, processing time and manual labour. It produces neither dust nor sludge, it doesn't damage the machine, and it creates a uniform effect in both sampling and production machines.



JEANOLOGIA G2 Cube



ITV Denim Washing seminar © Photo ITV Denim

Levi Strauss & Co. has started preliminary development work in their Plock facility in Poland using Tonello's NoStone® technology. They were able to achieve the same authentic vintage look on their denim garments with the NoStone® process, but without the environmental, economic and mechanical disadvantages.

Of course it is also very important to bring the latest technogies to the brands and retailers all over the world. ITV Denim, for example, organized the seminar on washing "Watch Your Wash" in July 2016 in Los Angeles featuring major brand names in USA fashion. Three days dedicated to innovations and washing techniques, designed to achieve extraordinary effects and highlight the ITV collection fabrics with one overriding focus: sustainable washing. The technical partner of ITV Denim for the washing process, from selection to finishing, was NEARCHIMICA, an all-Italian company specializing in chemical fabric processing, distributed on the American market by the prestigious DURACHEM GROUP.

A very interesting technical application designed by NEARCHIMICA is the product called "Booster NCS", a solution designed to boost laser efficiency, making it unnecessary to use permanganate later on, while achieving the same outcome; in combination with a fabric with a white internal fiber, because indigo does not penetrate, the result is a unique product which requires just two laundering phases.

That's the end of our look at textile finishing processes. Thanks to such a profound innovative spirit, not to mention diversity of ideas, the denim industry has an enormous potential for growth, provided that consumers take to new trends and added value. It therefore seems that, for high-quality denim jeans at least, the future is bright.

Market outlook

For example the research analyst Technavio forecast in the latest edition of the 'Global Premium Denim Jeans Market 2015-2019' report the global premium denim jeans market to grow at a CAGR of 8.12% during 2014-2019. The premium denim jeans market includes all those denim jeans which cost \$160 and above. The end users for these products are usually the HNWIs who are willing to spend more money for a good pair of jeans. What sets it apart from the normal jeans is the comfortable fit and premium quality of the cloth, as well as the label attached to them.

The Chinese and Indian markets should help to promote growth too. China is now the second largest jeans market in the world, valued at \$12 billion in 2015, while consumers' affinity for denim jumped from 39% to 63% from 2003 to 2016, Cotton Council International (CCI) and Cotton Incorporated's 2016 Global Lifestyle Monitor Survey shows. Messe Frankfurt HingKong recently announced in a news that this favourable market has attracted an increasing number of industry-leading denim suppliers to partake in the Beyond Denim hall at Intertextile Shanghai Apparel Fabrics – Autumn Edition 2016. In addition the 'Global Lifestyle Monitor: China' says that the top 5 clothing purchase drivers in China are fit, comfort, quality, style and fiber and also sustainability is an important factor in their purchase decisions. In comparison to these Chineses figures in India denim jeans is still a development market with a high potential. WWD wrote in an article 'India's Denim Market Seen Primed for Growth' in January 2016: "Yet as J. Berrye Worsham, president and chief executive officer of Cotton Incorporated, noted at a two-day summit on 'Denims: A Democracy in Fashion' in Ahmedabad, in Western India, only 32 percent of people in India like to wear denim. Sharing a recent study by Cotton Inc., he said 71 percent of people in Europe and Latin America enjoy wearing denim, followed by 70 percent in the U.S., 58 percent in China and 57 percent in Japan." On the other hand the article says that the film industry from Bollywood has led the trend for city residents to totally accept Denim Jeans, with rural areas not far behind. It remains to be seen, though, whether exponential growth is indeed possible.

New denim applications

Additional potential could nevertheless still offer the hope that denim could become a mass market in other textile products other than trousers, shirts and jackets. Above all, this requires groundbreaking new ideas. The so-called "killer application".

The World School of Design (WSD) was engaged in this search together with Archroma and the Society of Dyers & Colourists (SDC) as part of the "Do the Denim" competition. It is a huge challenge, but one which has already been overcome. The 70s hit "Jeans On" by British singer David Dundas caused huge waves in the denim market. Denim bags and shoes hit the shelves, and there were even car seats made of the cult material.





LUGGAGE BAG WITH A SOLAR SUNROOF

SILVER-CONCEPT: **GRAIN PORT BAG**

BRONZE-CONCEPT:

VW brought the Jeans Beetle onto the streets of Germany in 1973. Even today there are denim variants of a multitude of different products, such as baby seats and pushchairs.

Some of the ideas submitted by the competition's finalists proposed similar ideas. Manan Grover from the Design And Innovation Academy presented a Vespa denim seat cover, Aksshaya Venkat from Amity University Mumbai developed denim boot sandals, Vibhuti Nilesh Aarte from School Of Fashion & Textile Design in Mumbai created an elephant money bank from denim and Ananya Praveen a lounge chair cushion.

The winners have been Ankush Umeshprasad Tripathi from University Of Mumbai with a luggage bag with a solar sunroof from denim (Bronze), Harshit Goel from Design & Innovation Academy with a grain port bag (Silver) and finally Robin Roy Pursuing, who studies fashion design at Nift Patna with a concept for a reclaimed denim- trans jacket bag (Gold).

Perhaps new ideas for denim will come from an entirely different direction, such as from start-ups that aim to convert used jeans into a useful resource. This is a market for the future, as is the idea of making denim fabrics out of recycled materials.

© Photos Archroma

Recycled denim and denim recycling

There are already a wide range of promising concepts for using recycled pre-consumer and post-consumer cotton in the production of new denim fabrics. Jimtex Yarns, a division of Martex Fiber Southern Corp., in August 2016 announced a sustainable denim collection called R₃ DenimTM in cooperation with Denim North America (DNA). The R₃ DenimTM line utilizes certified Martex Fiber ECO₂cotton[®], a sustainable fiber solution for



The Lenzing 4S Denim Collection with Deconstructing Denim pencil skirt and jacket in Lenzing Modal® © Photo Lenzing/Richard Cordero

today's environmentally conscious manufacturers. ECO2cotton® is manufactured through a unique process utilizing pre-consumer cut cotton knit waste, which is refiberized and spun into a beautiful yarn, which competes at the highest levels of sustainability, using no chemicals or additives to alter the fiber structure.

Lenzing, a worldwide leader in wood-based cellulose fibers, had launched their "4S Denim Capsule Collection" at Kingpins 2016 show in Amsterdam. Produced in partnership with Jeanologia, and featuring fabrics from several mill partners, the collection showcases original denim silhouettes for both womenswear and menswear. The name of the collection 4S stands for Softness, Stretch, Science and Sustainability. The supply chain partners for 4S are Lenzing, Jeanologia (Spain), Advance Denim (China), Atlantic Mill (Thailand), Blue Diamond (China), Orta (Turkey), Toray International (Japan).

Lenzing wrote that companies are pioneering techniques and practices based on sound scientific research, reducing the use of energy, water, chemicals in the denim supply chain as they strive to reduce their overall environmental impact. None of these advances would be possible without collaborations within the supply chain.

In August 2016 Lenzing announced they will launch a new TENCEL® fiber made from cotton waste fabrics to drive 'circular economy' solutions in the textile industry. The new generation of lyocell fibers will be the most ecological wood-based fiber on the planet – combining cotton waste recycling with Lenzing's pioneering closed-loop TENCEL® production on a commercial scale. Furthermore Lenzing wrote that the new TENCEL® fiber introduces an innovative approach to marketing. The fiber is not sold directly to yarn or fabric manufacturers.

It will be exclusively offered to leading retailers and brands that in turn could produce their garment collections in the most sustainable way by engaging the right value chain partners. This ensures close co-operation and transparency in the entire textile value chain.



TENCEL® - enabling 'circular economy' in the textile world & next-generation ecological fiber © Photo Lenzing

Furthermore Lenzing is especially counting on making use of the exceptional softness of Modal and Tencel.

In September Lenzing presented a new method to measure softness together with the German instrument manufacturers, Emtec Electronic. The reasons for Lenzing whave been that the "look" itself is no longer the only important factor. The comfort that fashion should offer now also has priority.

The softness of the textile is an important parameter for comfortable clothing and an increasing number of customers have asked Lenzing for measurements to explain the softness of their fibers in physical terms.

Jeans from 100% recycled cotton has been done before. Blue Loop Originals have introduced garments made from recycled denim already in 2014 to the market. The Dutch label lives by the motto "born to reborn" and states that they discovered a way to give worn-out clothing many new lives. After a number of outstanding product innovations with the inclusion of worn jeans (up to 50%), Blue LOOP Originals in 2016 have joined forces with TenCate in Nijverdal. Together they produced a two-person tent made of worn jeans. This ambitious project - the aptly named BlueCAMP - is a great addition to the field of sustainable camping.

However, the R-Denim 100% recycled cotton jeans from Blue LOOP Originals comes from pre-consumer denim waste.



BlueCAMP by Blue LOOP Originals and TenCate / © Photos TenCate

In May 2016 Levi Strauss & Co. announced that they have partnered with textile technology startup Evrnu[™], SPC to create the world's first jean from post-consumer cotton waste – in the form of pair of Levi's ® 511 ® jeans – using five discarded cotton T-shirts to make new fiber.

The cutting-edge method not only converts consumer waste into renewable fiber, it also uses 98 percent less water than virgin cotton products, according to Evrnu data. Although some virgin cotton was used, this represents a huge breakthrough in recycling technology.

Each year in the U.S. alone, 13.1 million tons of textile waste is created, with 11 million tons ending up in landfills. Until now, there hasn't been a viable solution to turn old clothes into new without compromising quality or strength. But by being able to breathe new life into used clothes, both companies are embracing the vision of creating a circular economy that extends the life of cotton and eliminates waste.

Very interesting in this context is a news from Australia. Researchers at Deakin University have found a way to separate blends of cotton-polyester material, providing a major breakthrough for recycling textile and other waste. Using an ionic liquid (a salt in a liquid state) the researchers Dr Nolene Byrne and PhD student Rasike De Silva have developed a simple process to separate polyester-cotton blends into their individual components.

Unlike harsh solvents which have previously been used to dissolve polyester, ionic liquids provide an environmentally friendly solvent to chemically separate polyester/cotton blends. Another benefit of using ionic liquids, says Mr De Silva, is the ease with which the polyester and cotton can be separated.

The first steps have therefore already been taken. Now, we must press ahead with these individual methods and combine them so as finally to make new jeans out of old jeans, just as we pledged in a recycling article in 2013. Let's take a look at a couple of the trends emerging from the technical textiles sector.



The world's first Jean (Levi's® 511® jeans) from post-consumer cotton waste Photo © LEVI STRAUSS & CO.





Piedmont from R3 Denim collection Photo © R3 Denim

Norton Hoodie by Blue Loop Originals made from 50% Cotton, 6% Nylon, 5% Polyester, 25% Recycled denim and 14% Viscose. Photo © Blue Loop Originals

Ideas for denim from technical textiles

When Levi's had the idea to make jeans stronger for people who push their clothing that bit harder, or need more protection, they decided to use Dyneema by DSM. Including just 7% Dyneema fiber more than doubled abrasion resistance and boosted strength by 25%. Yet they still felt like a Jeans. The Ultra High Molecular Weight Polyethylene (UHMWPE) fiber branded as Dyneema®, is the world's strongest fiber. Dyneema® offers maximum strength combined with minimum weight. It is up to 15 times stronger than quality steel and up to 40% stronger than aramid fibers, both on weight for weight basis. Dyneema is mainly used for a wide range of technical textiles applications. Meanwhile other brands and fabric manufacturers like Berto, Saint, Cone Denim or Draggin are using Dyneema for very strong jeans. Markets are for example motorcycle wear or street sportswear.

Another example comes from functional apparel. In 2015 Westex by Milliken and Cone Denim announced an exclusive partnership to provide innovative flame resistant denim apparel fabrics. Both leaders within their respective industries, Cone Denim and Westex by Milliken wanted to merge fashion with protective, reliable industrial workwear fabrics. The result of the partnership are the Westex Indigo[™] flame resistant fabrics. They are certified to NFPA 2112 and meet NFPA 70E PPE Category 2 protection.

Guaranteed flame resistant for the life of the garment in either hightemperature industrial or home washing procedures, $Indigo^{TM}$ provides protection from electric arc and flash fire exposures as well as multipurpose protection from molten ferrous metal and welding exposures. Markets are for example workwear.

Counter-trends

Despite the enthusiasm for the many new fibres, processes, qualities and possibilities, a pre-existing counter-trend persists nonetheless, which unfortunately is only partly sustainable. The idea behind it is to produce jeans with "originality", in other words by hand, and when possible using old-fashioned machinery and indigo-dyed pure cotton denim. The trend is embodied by, for example, the Japanese company Momotaro, and is increasingly popular around the world. And the counter trend is mutating. Companies such as Noble Denim, 3x1 denim and S.M.N. in the USA, Kings of Indigo in the Netherlands (albeit with a slightly different concept) and Selfnation in Switzerland already offer a small collection of bespoke unique pieces for a price of roughly €200. In Germany, Fairjeans offers a small collection made of organic cotton with GOTS certification. Since, generally speaking, these companies lack large marketing budgets, these labels place emphasis on social networking, sharing rudimentary videos of their production processes that are more easily absorbed than some top-level and star-studded commercials.

Another part of the trend for high-quality fabrics is Selvedge (Selvage in the US). The word comes from "self-edge" and refers to the automatic development of fabric edges. In the original shuttle weaving process, a small bobbin of yarn is carried inside a shuttle that travels back and forth across the loom. Since the yarn is not cut after each weft insertion, the tightly bound edge cannot unravel.



Cone white Dyneema yarn PHOTO © Royal DSM



Including just 7% Dyneema® fiber more than doubled abrasion resistance and boosted strength by 25%. Yet they still felt like 501®s. PHOTO © Royal DSM / LEVI STRAUSS & CO.



Saint Unbreakable Denim is a blend of Dyneema® and natural fibers that outperforms aramid-lined jeans and jacket combos. PHOTO © Royal DSM / SAINT



Chrome Industries' Wyatt Collection featuring Cone Dyneema-infused denim PHOTO © Cone Denim





Heavy weight selvage jeans by Noble Denim PHOTO © Noble Denim

Momotaro jeans with selvadge PHOTO © Momotaro

The selvedge which can only be seen in cuffed jeans represents a unique variant of jeans. In addition fabrics woven on these vintage looms contain a depth and dimension that is completely unique.

Conclusion

Some denim manufacturers, especially those at the forefront of fashion, have long since developed lines for the individual big trends of denim clothing, and thus started using many new techniques and technologies. The 16th trend letter of the Deutsches Mode Institut (German Fashion Institute) thus reports to the Denim Premiere Vision about the intriguing freedom of movement in items of clothing with up to 150% elasticity, the softness of velvet, the chenille effect and omnipresent softeners. It also highlights the widespread use of lasers or oxygen in modern processes to create bleached and used effects. All of this only goes to show just how quickly the industry as a whole is moving. It also shows that these manufacturers are very much ready to invest in new and groundbreaking methods. You get the impression that the industry has only just really set off in the right direction with the realisation that anything is possible.

As a result, exciting times lie ahead for the denim industry, where the momentum of developments in fibres and processes will come face to face with a yearning for innovation and ever larger markets. To begin with, many of the largest trends will be mixed together even more. The industry has already achieved or will soon achieve innovative, stylish products made of organic cotton mixes with other sustainable or recycled fibres produced using completely sustainable manufacturing processes. The next steps must be to achieve full transparency during the manufacturing process, and for all of the important operating figures. In the long run, a link will be made to Industry 4.0, so that every consumer can produce their own personalised and, ideally, tailored jeans - perhaps even with their signature, monogram or embroidered design. All of this might be possible as early as 2023, for in that year, good old jeans will be celebrating their 150th birthday.

"Major changes expected at the ITMA Asia + CITME 2016"

Transformation meets innovation at the leading trade fair in Asia

Not quite one year since the ITMA in Europe, the ITMA Asia + CITME 2016 is about to throw open its doors, providing Asian textile manufacturers in all relevant segments with an opportunity to gain a first-hand insight into the latest developments in the machinery sector. China, still the uncontested leader of the textile manufacturing and export industry, has set itself some ambitious goals in the latest Five-Year Plan (FYP). And this time the focus is on quality rather than quantity.
China plans to press ahead with the transformation of the high-tech sector initiated in the last FYP and to manufacture not only the most, but also the best textiles in future. This will, of course, alter China's global competitiveness in the high-end and premium segments – particularly with respect to Europe. However, it is almost more important for China to increase its production of premium merchandise for its own domestic market. This is true in the case of clothing for an already sizeable and growing middle-class section of the population as well as high-quality technical textiles needed for making improvements in other industrial sectors or in the field of environmental protection.

For a long time during China's rapid industrialisation, environmental protection was attributed little importance for the development of the country, but according to the current FYP it is now to play a key role in further development. The desire for greater sustainability was strikingly underlined by the signing of the World Climate Agreement negotiated in Paris in December 2015. Once the parliament of the People's Republic had voted to ratify the agreement, the USA was quick to follow suit, and in the run-up to the G2O summit in September the presidents of the two largest economic powers, Barack Obama and Xi Jinping, were able to present the UN Secretary-General Ban Ki Moon with the documents required to formalise the agreement.

The speed of this ratification demonstrates just how committed China is to environmental protection. Industrial transformation is equally high on the agenda. Both these issues are integral parts of the overall plan to make China a clean high-tech country.

Said Mr. Gu Ping, Vice President of China Textile Machinery Association (CTMA), "As China's textile industry continues its transformation, the demand for advanced machinery and technology is on the rise. For textile manufacturers to keep ahead of the industry, they need to readjust their strategy to enhance overall production efficiency. They should adopt a longer-term outlook to focus on the quality of their products which will ultimately contribute to their company's bottom line. This will lead to a demand for new machinery and technology to modernise and upgrade their existing textile equipment."

The strategy is therefore clear-cut and unwavering. Now it is all a matter of implementation, and the ITMA Asia + CITME 2016 is soon destined to provide the Chinese textile industry with an excellent opportunity to put words into action. However, what is somewhat loosely referred to in economics as "transformation" can pose a major challenge to individual businesses. One thing for sure is that rising wages make it increasingly difficult to engage in mere price wars. Hence, individual textile companies will need to realign themselves, seek other lucrative segments and press ahead with specialisation – either in the export market or the domestic market, where purchasing power has been boosted by the rise in wages. "In combination with Microsoft HoloLens we are entering a new world of Customer Services solutions with highest benefit for our customers."

Marcel Bornheim Head of Customer Services Oerlikon Manmade Fibers Segment

The Future is Now

Oerlikon Manmade Fibers Segment with its brands Oerlikon Barmag and Oerlikon Neumag again is setting the benchmark for the production of manmade fibers. The latest Oerlikon Industrie 4.0 solutions will give our customers the decisive competitive advantage.

Be inspired by our innovative team at ITMA Asia + CITME in hall 2, booth A 16.



Follow us on Facebook! www.facebook.com/OerlikonBarmag www.facebook.com/OerlikonNeumag

For further information visit us at **www.oerlikon.com/manmade-fibers**





Miss Maria Avery, Secretary General of CEMATEX, said: "The combined show is now well-entrenched in the textile machinery exhibition calendar. It draws all the leading textile and garment manufacturers and is an essential showcase for the Asian market, offering plenty of business and networking opportunities. We would like to encourage our visitors to plan their trip early and purchase their badges online via PayPal."

So much for the situation in the run-up to the fair and the event organisation. Let's now take a look at the key elements – the exhibitors and their machines.

The **Oerlikon Manmade Fibers** segment (Hall 2 / Booth A16) primary focus is on the innovative Oerlikon Manmade Fibers Industrie 4.0 system control and customer services solutions. With new features and offerings for the intelligent 'POC – Plant Operation Center 4.0' system control software, producers can now maintain a constant overview of all processes – from the polycondensation, spinning and texturing all the way through to downstream further processing procedures. This helps clients increase the productivity of their systems, save energy and deploy resources efficiently.

Oerlikon Barmag – which focuses on CP, POY, FDY, DTY, industrial yarn (IDY) as well as tape and monofilament products and services – alone will be presenting 12 new manmade fiber spinning solutions at the trade fair. The WINGS POY family now has a further new member, now also including the WINGS POY HD available for processing high titers.

With its expanded godet system, the new winder has been designed especially for the requirements of high yarn titers of up to 500den polyester POY. In conjunction with the EvoQuench radial quenching system, microfilament yarns with high titer ranges can now also be manufactured with outstanding properties.



OERLIKON BARMAG WINGS POY HD is designed for the requirements of high yarn titers of up to 500den polyester POY.

Combined with the eAFK texturing machine – also designed for high titers – Oerlikon Barmag therefore offers a total 'From Melt to Draw Textured Yarn' concept that produces polyester DTY with up to 450den in accustomed Oerlikon Barmag DTY quality. Also being unveiled at the trade fair are 'specialists' for semi-dull and trilobal bright (WINGS FDY SD / WINGS FDY BR) tailored to the specific requirements of customers. And there will be the flexible WINGS FDY PLUS and WINGS FDY PLUS eco variant for a broader application window. EvoQuench is now also newly available for polyamide processing. With this development, Oerlikon Barmag is the first-ever supplier of systems for high-quality polyamide 6 micro-titers both for the POY and the FDY processes.

With the eAFK HQ, Oerlikon Barmag will be presenting the world's most productive automatic texturing machine. The eAFK HQ is designed with 12 sections, each with 48 positions.

For the industrial textiles growth market, Oerlikon Barmag will be unveiling its latest developments for the production of yarns used in airbags, safety belts and tire cord. Here, the focus will, above all, be on polyamide 6 and polyamide 6.6 solutions.

Oerlikon Neumag will now be presenting its fully-comprehensive staple fiber production plant portfolio as the leading supplier of technologies and plants within the global staple fiber market. For the nonwovens (spunbond, meltblown and airlaid) sector, Oerlikon Neumag will be premiering the new, multifunctional forming table for the Oerlikon Neumag meltblown systems which is characterized by its considerably reduced footprint. The FAUS operating unit for automating meltblown systems ensures an increase in both their productivity and reliability. Five different modes of operation with a total of eight different programs guarantee that future meltblown nonwovens can be manufactured even more efficiently.



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With SUN – SERVICE UNLIMITED Saurer sets new service standards for the entire textile value chain. SUN is a bundle of differentiated services that add real value to Saurer machinery throughout its entire life cycle. Highly trained staff accompanied by state-of-the-art tools improve our customers' daily business in a flexible and individual way. We provide the owners of Saurer machinery with innovative products and best services to improve production and profitability.

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- Installation
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- Original Parts
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WE LIVE TEXTILE.



And with its BCF systems, the three-end S+ and the single-end Sytec One, Oerlikon Neumag fully covers all requirements of internationally-active carpet yarn manufacturers.

The Swiss based **SSM Schärer** Schweiter Mettler (Hall 1 / Booth A18), inventor of the electronic yarn traverse system, will continue their trendsetting tradition with the presentation of breakthrough technologies. SSM will show their latest technologies and inventions for the first time in Asia.

Special focus lies on the new XENO-platform with the enhanced DIGICONE® 2 winding algorithm, enabling a 10- 20% increase on dye package density with same dyeing recipe. For the first time ever the SSM X-Series will be shown to the public. The machines (TWX-W/D, PWXW and PSX-W/D) are the most economized winding solution, reduced to the max yet maintaining highest flexibility for any cost efficient winding application.



Machines for the following applications will be presented: Dye Package Winding/Rewinding (including Technical Textiles), Assembly Winding (doubling), Air Texturing and Sewing Thread Finish Winding. Besides the displayed applications, SSM offers renowned machines for False Twist Texturing, Air Covering, Draw Winding, Yarn Singeing and Conventional Covering. Together with the introduction of the XENO-platform and the X-Series, SSM is demonstrating their market leadership.

Rieter is showing solutions for processing of synthetic staple fibres as well as machines of the latest generation, which are able to process all commonly used fibre types. Visitors to the exhibition learn more about the comprehensive portfolio of the After Sales services, about components for the economic manufacture of high-quality yarns as well as the extended SPIDERweb for the optimal use of the spinning mill. Highlights are the new RSB-D 50 single-head draw frame generation, the J 26 air-jet spinning machine with P 26 polyester option and the new combing set, comprising the E 36 OMEGAlap and six E 86 combers for the 540 kg/h set production, which will be presented for the first time in China.







Due to its intelligent concept, the TWIN version is compact and requires little space.

Is it possible to achieve maximum economic efficiency and reliability in the smallest spaces?

The answer is a definite Yes when it comes to our new TWIN breaker Draw Frame TD 9T. It is a twin draw frame, but also available as single TD 9 version. Thus it is possible to implement each even and uneven number of drawing heads.



For the first time in short staple spinning, it also features a new can format: JUMBO CANS with 1,200 mm diameter reduce the number of can transports and significantly improve the efficiency of the downstream machines.

Getting fibers into shape – since 1888.



A slight reduction in quantity in exchange for greater specialisation and improved quality is what will be demanded of the textile industry in future. The realignment process will require many companies to re-equip their machinery park with the latest market-leading technology. This brings us back to the forthcoming ITMA Asia + CITME 2016, which could be poised to become a historic event – one that marks a turning point, so to speak.

Given the fair's possible future significance, it is more than fitting that the event be staged at the new National Exhibition and Convention Centre (NECC) in Shanghai. Based in the booming Yangtze River Delta region, the NECC aims to serve China and the world with its cutting-edge design and multiple facilities. It should help drive China's economic restructuring, fuel the transformation of economic growth patterns, and contribute to the fast and healthy development of the Chinese economy and society.

NECC will be the largest single block building and exhibition complex in the world with a total construction area of 1.47 million square meters, among which 1.27 million square meters are above ground. This large complex offers 500,000 square meters of exhibition space, including 400,000 sq m of indoor exhibition space and 100,000 sq m of outdoor display areas. The indoor exhibition space include 13 large exhibition halls (28,800 sq m each), and 3 small halls (10,000 sq m each).

With China aiming to conquer new segments of the textile industry, it may wish to abandon old ones or even find itself compelled to do so. Rising wage costs are pushing down margins, and for several years numerous Chinese companies have been shifting manufacture of nonvalue-added mass products to other low-wage countries in Asia, such as Vietnam or Bangladesh. In addition, some African countries, such as Ethiopia, have an emerging textile industry and are attracting business with the help of low wages and generous funding programmes. Consequently, a highly diversified demand for machinery may be observed at the ITMA Asia. All these factors are destined once again to make the leading trade fair in Asia a very special event for the whole of the global textile industry.

Cematex announced in March that at the close of space applications, over 90 per cent of the 180,000 square metres of exhibition space had been sold. Chinese exhibitors make up the biggest country group, booking over 65 per cent of the total exhibition space. The other top participating economies are Germany, Italy, Japan, Switzerland and Taiwan. As always exhibits are organised into sectors based on manufacturing processes. Spinning machinery forms the largest sector, followed by finishing, knitting and weaving. In addition, the nonwovens sector has seen a 20 per cent increase from the last combined show in 2014.

Let's list some basic information. The show will be held from 21 to 25 October 2016 and the opening hours are from 9am to 6pm daily. The fifth edition of the combined textile machinery show, is expected to attract a trade visitorship of around 100,000 from around the world. As two years ago visitors can purchase badges online at www.itmaasia.com and www. citme.com.cn until 1 October 2016 and enjoy a discount of 40 percent.



RIETER E 36 OMEGAlap

Bräcker, **Graf**, **Novibra** and **Suessen** are presenting components and systems for the economic manufacture of high quality yarns from natural fibres, synthetic fibres or their blends.

The new STARLETplus traveller from **Bräcker** with its improved coating shows a better resistance against corrosion. This is of high importance in challenging spinning conditions like high humidity or aggressive fibres. As a result the service life can be extended up to 50 %. Another highlight will be the redORBIT spinning rings, which are designed to produce high quality yarns at top speeds. The system consisting of spinning ring, ring holder, and support ring is a cost-optimized solution for ring spinning machines. It allows increased speed and thereby a higher production. Other products will include TITAN spinning rings, PYRIT and ZIRKON travellers, and the well-known range of BERKOL cots and aprons.

Graf now offers a new flat top system, which can reduce the stoppage time by up to 70 %. The so-called EasyTop is applied on flat bars designed for magnetic attachment. The flat tops, equipped with a metal carrier, are attached securely and precisely by means of a magnetic connection. Hipro metallic card clothings ensure top performance and precision together with an exceptionally long working life. Hipro metallic card clothings are suitable for all standard man-made fibres in the nonwoven sector and also for wool. The X-Comb segments can be used on comb-bodies requiring individual segments from other manufacturers and thus now make the leading Graf technology also accessible for these conventional combs.

Novibra is introducing the new LENA (Low Energy consumption and Noise Absorption) high-speed spindles. Another new product presented is the clamping and cutting crown CROCOdoff, which is also available as the version CROCOdoff Forte for coarse yarns. The crown is operated by the spindle speed and has been designed for machines with autodoffer.



Suessen will exhibit various new components for ring and rotor spinning machines. In ring spinning one of the highlights will be the EliTe®CompactSet Advanced, a compact spinning system, which can be installed on nearly all types of ring spinning machines. The system includes various innovations resulting in better yarn quality and increased productivity.

Suessen will also present various new Premium Parts for rotor spinning machines. The new TwistTrap Navel is a modified navel with a patented twist-retaining element. The navel, which is applicable to all types of spinboxes, provides an additional false twist, which results in better spinning stability. The production increases by 10 % to 15 % due to the possible twist reduction. Another new Premium Part is the PS7 TwinDisc.

The **Saurer Group** are proud to present their technologies in fiber processing from raw material to a multitude of yarns and finishing. The E3 label representing triple added value - Energy, Economics and Ergonomics, ensures that all innova tions are based on customers' key demands. The Saurer Group is the only full range supplier in the world offering complete automation from roving with an interspersed transport system to ring spinning and up to linked winding.

Zinser will present future-oriented strategies for personnel-free, processoriented and highly efficient production. With the Autoflow automation solution, ZinserSpeed 5A roving frame as well as Zinser 72 and 71 systems, the textile machinery manufacturer paves the way to a more profitable future for its customers.



SUESSEN TwistTrap Navel



SAURER SCHLAFHORST Autocoro 9

Schlafhorst will present the new Autoconer 6 and the new Autocoro 9 – both must-see exhibits for spinners. The Autoconer 6 is the final piece in the jigsaw for completing the textile technological value creation in the spinning and winding processes of Zinser and Schlafhorst. With its smart sensor technology, it is ideally equipped to deliver perfect, individually automated processes. Innovations such as Launch- Control, SmartCycle, SmartJet and Speedster FX boost productivity by up to 12 % compared with previous models. The new Autocoro 9 is a strong driver of optimised textile value creation in the textile process chain: 25 % lower energy consumption, 19 % reduction in spinning costs, proven rotor speeds of 180,000 rpm, take-up speeds of 300 m/min and a 60 % lower servicing outlay are just some of its outstanding per- formance features.

The semi-automatic BD product series produces extremely economical packages in Autocoro quality up to 320 mm in diameter. Up to 10 % less energy consumption, extremely fast take-up speeds of 230 m/min on all lengths of machine and improved use of available space reduce spinning costs and increase the profitability of spinning mills in the semi- automatic segment.

Spinning mills should have a look at the Plant Operation Center (POC) from Saurer Schlafhorst and Zinser. They can use their production and quality data to improve efficiency.



Allma and Volkmann will be presenting innovative products and solutions in the following segments: staple fibre yarns, carpet yarns, tire cord, industrial yarns and glass filament yarns. The CompactTwister is a high-performance twisting machine for staple fibre yarns. Energy savings of up to 40 % can be achieved with the eco-drive concept and eco-spindle technology with coordinated spindle combina tions. The systematically integrated HD feeds set new standards in energy savings and optimised feed weights for efficient downstream processing. The productivity of the CompactTwister is 30 % higher thanks to high delivery speeds of up to 120 m/min. Operating costs drop as a result of lower energy, space and maintenance costs.

The CableCorder CC4 cabling machine offers energy savings of up to 50 % in the tire cord cabling process. The higher economic efficiency is also increased by up to 50 % fewer yarn breaks, improved quality and high machine efficiency. An innovative enhancement of the machine to the production of 2-ply tire cord is the option for producing also 3- ply tire cord in a single-stage process.

Furthermore the business unit Saurer Components presents reasoned solutions for staple and manmade fibres. To name a few: Accotex® AccoSmart the new sandwich cot based upon a completely new revolutionary technology platform. Texparts PK 2630 SE and PK 2630 SHE weighting arms are designed to be retrofittable with the two compact systems of well-known suppliers. Fibrevison® Fraytec FV2 broken filament monitoring boasts increased trigger optics with software selection of fault size. And the latest high speed roller-bearing Separator Roller Temco® VR50300-00-HS is designed to replace air bearing separator rollers and therefore saves high compressed air costs.



Savio (Hall 1 / Booth B28) will exhibit breakthrough innovations in the winding segment: the new Eco PulsarS automatic winder, the drumless Multicone technology and well-proven Polar winding machine.

Eco PulsarS will be showcased in China for the first time. With its innovative platform it can save up to 30% power bill, reduce yarn waste, air conditioning costs & noise inside the spinning room. Energy is a major cost component in the textile industry and suction represents 75% of the total energy of a winding machine.

EcoPulsarS's solution of the "individual and independent suction unit per spindle" represents a real break-through versus the conventional system. Each unit operates at optimum suction values without influencing the rest of the spindles. In addition, independent suction systems are provided to the auxiliary devices for fully automatic machines. Since suction is generated only when needed, customer can save up to 30% power bill costs, while a better efficiency, a smoother winding process and overall superior package and yarn quality are achieved too.

EcoPulsarS combining all new features and design has created an environment in which each part of the machine can operate at its optimum level. Spindles and bobbins feeding systems set independently the level of suction required. Suction is generated as needed and used without losses. The new Controlled Cut System, Yarn Tension Control System, Waste Collection&Separation System and Upgraded Splicing Solutions, each contributing to the overall reduction of process downtimes. Savio's thread-guide technology, Multicone (drumless), represents the proper solution to achieve flexibility in package formation, for an easy and fast change in the winding process to prepare all formats. Packages for dyeing, warping, weft, knitting, double twisting, require a different and flexible package formation in terms of geometry, edges shape and density. "Multicone" system represents today the proper solution. Savio's thread guide electronic control allows to set winding angle, traverse stroke, position on the package tube and the yarn distribution over the package. The user can interact with a visual interface on the PC screen for drawing the final package and is able to customize and tailor the package design, according to his requirements for the downstream process.

SAVIO VolufilMulticone Control de la contro The Polar winder is absolutely the Savio bestseller in the traditional standard winding platform and still the #1 winder in many world markets. All Polar models (manual feeding, stand-alone autofeeding, automatic link feeding) represent the utmost technology available. The model pioneered the use of efficient and reliable electronic servo controls to boost performance.

Savio says that this state- of-the-art machine has been designed keeping in mind the demands of their customers in terms of increased productivity, reduced energy consumption, reduced waste and production of yarn package of top high quality. Further emphasis has been given to realize machines friendly use and almost maintenance free for any type of working environments.

Reiners + **Fürst** will (Hall H1 / Stand B 30) present new travellers for Siro-Compact with optimized geometry and new surface characteristics. The end-users benefit from low yarn hairiness and longer traveller service life.

Trützschler will exhibit innovations from all four divisions of on a 550 sqm booth and many machines will be exhibited for the first time in Asia. Visitors will see a lot of highlights. The first, in spinning preparation, of course will be the new card TC 15. A whole range of individual measures ensures a performance increase of 15% compared to the predecessor machine. One example is the new web doffer with significantly reduced tension drafts. The result: Increased sliver evenness and improved running behaviour.

Next highlight is T-MOVE which stands for space saving and increased efficiency. The new moving head allows a can change at high delivery speeds. This improves card efficiency. The service life of the cans increases because they do not have to be moved during can change. Naturally, T-MOVE is designed for the new JUMBO CANS.

The new JUMBO CANS with 1,200 mm diameter hold 43% more sliver than regular cans with 1,000 mm diameter. The new Trützschler cards, draw frames and combers have been designed for this new, more economic can format. This means less can transports and increased efficiency of the downstream machine due to longer runtimes in the creel. The quality is improved by a reduction in sliver piecings. Depending on the size of the spinning mill, this results in several hundred thousand piecings less per year.



With the Integrated Draw Frame IDF 2 it is possible to produce cotton rotor-spun yarns in the entire yarn count range without additional draw frame passages. These cost savings are simple to achieve without compromising yarn quality.

The TD 9T - TWIN breaker draw frame – is a new concept. This Trützschler TWIN draw frame has no efficiency coupling of the two deliveries. This results in approx. 15% increased overall efficiency compared to double head draw frames. TD 8 is the new can changer for the established autoleveller draw frame. Now, for the first time, there is also an underfloor can changer for small cans. This simplifies the operation significantly. TD 8C is a single head technology with the space advantages of a double head draw frame. The space-saving COMPACT installation of the leveller draw frames is achieved without the disadvantages of conventional double head draw frames.

More flexibility is not possible: The Toyota-Trützschler TCO 12A, the comber for automatic lap change and automatic piecing, offers manual, semi-automatic or fully automatic flap transport. It is equipped with an automatic lap change with automatic piecing.

When dealing with fiber blends, the accuracy of weighing systems is unbeatable. The new Trützschler development T-BLEND also relies on accurate weighing instead of indirect volumetric measurement methods. Based on a series of measures it was possible to double the performance per weigh pan. The new Modular Fiber Blending System T-BLEND combines maximum precision and high production.

In the new Foreign Part Separator T-SCAN TS-T5, five detection technologies work hand in hand and ensure an all-time high separation efficiency: the F-module detects coloured parts, the G-module shiny parts, the P-module transparent and semi-transparent parts, the UV-module fluorescent parts and finally the LED-module smallest thread-shaped parts.

The quality and production data system T-Data processes more than just the regular data. Trützschler sensors are used to determine neps in the card sliver, distances of carding elements or actual energy consumption of the machines. The webbased T-DATA ensures mobile availability of all these data.

And last but not least visitors looking for Made in China – for China will find the Card TC 10. This Trützschler card in the traditional working width of one metre has been specifically designed for the Chinese market. Trützschler Man-Made Fibers informs about two new developments in the area of carpet yarn systems. The first one is a high-performances, three-end machine concept and the second one an inline system for the production of BCF quality yarns from recycled polyester.

The M30 is the latest member of the symTTex system family. The 3-end machine completes the range of 2-end and 4-end BCF machines. Thus, the optimal machine configuration for every application can be custommade.

Furthermore Trützschler Man-Made Fibers and EREMA Engineering Recycling Maschinen und Anlagen have entered into a cooperation in the area of recycled materials,

particularly R-PET. For the new inline BCF solution, EREMA supplies a VACUREMA basic system and secondary components that produce a decontaminated polymer melt. The downstream spinning positions from Trützschler Man-Made Fibers spin the material into high-quality carpet yarns.



itema



Itema: 3 Technologies, 1 Brand

Itema is the only weaving machine manufacturer to provide the market with the top three weft insertion technologies: rapier, airjet and projectile.

Choosing Itema is the first right decision that leads you to success.

Itema weaving machines set a new technological benchmark with high speed and precision, exceptional fabric quality and ultimate versatility.

At Itema, we inject innovation in every step when creating our looms to unleash your creativity.

Our mission is accomplished only when exceeding your expectations.











Because we believe

Italy · Switzerland · China · Hong Kong · India · Japan · USA · Dubai



Trützschler CARD CLOTHING flats selection has been expanded by two products for special applications. NOVOTOP 58 is optimally suited for the application in the area of fine combed yarns at production speeds of up to 65 kg/h and machine width of one metre. A significant positive influence of the carding process is achieved by improvements in terms of tooth geometry, wire height, surface smoothness and the wire tips themselves. The air flow in the carding zone between cylinder and flat is optimised. This also significantly reduces fiber adherence and fiber breakage. And the flat clothing NOVOTOP 30 has been newly developed for the processing of coarse and/or dyed fibers and reclaimed fibers for rotor spinning. It is ideally suited for use with yarn counts below Ne 10 and realises high production speeds. The flat types NT 30 and NT 58 are available as MAGNOTOP and CLASSICTOP. The new GX1 clothing has been specifically developed for use in the area of carded and combed cotton. Thanks to improved fiber guidance it allows an optimal fiber transfer and thus significantly better nep separation.

Assistant Q can be observed in action at the **USTER** booth. Visitors will be introduced to him in his workplace, the Total Testing Center. Here, accurate test results are combined with real-time information from yarn clearers and additional testing instruments. Assistant Q's knowledge, experience and working practices are integrated in the USTER QUALITY EXPERT which is incorporated in the USTER TESTER 6 evenness tester. With Assistant Q, the Total Testing Center is an indispensable tool for modern mill management, making the leap from traditional data collection to powerful analytics and informed decision-making.



ITEMA Rapier R9500terry

Itema (Hall 3 / Booth E01) will showcase exciting, brand-new evolutions in both rapier and airjet product portfolios and officially present to the dynamic Asian markets the highly acclaimed ITMA novelties. Visitors to ITMA ASIA will have a total of 15 Itema weaving machines on display, of which 6 in Itema booth and the rest in Partner booths across Hall 3.

Itema will unveil the R9500denim - the brand-new product concept dedicated exclusively and especially to denim mills in search of customized solutions to enable them to respond faster, more effectively and efficiently to changing denim trends with versatile, high-performance, ad-hoc machinery. The R9500terry, already a big favourite of sophisticated premium terry weavers worldwide after its debut in Milan in 2015, will be officially presented for the first time in Asia. In airjet, a much-expected, all-new Jacquard application for the already successful Itema A9500p, weaving African Damask on show will, no doubt, be highly appreciated by devoted Itema airjet Customers worldwide. Furthermore there will be a rapier R9500p (width: 190cm) weaving a shirting fabric, another rapier R9500p (width: 220cm) weaving a heavy denim 14 oz. and an airjet A9500 (width: 230 cm) weaving a grey cotton. At the **BONAS** (Hall 3, Booth C01) booth a Rapier R9000 (width: 340cm) will weave a home textile and another Rapier R9000 (width: 190 cm) will weave a label fabric.

In an unprecedented move, Itema releases a manifesto to match even better than before the exact weaving requirements of Customers with latest and most advanced technology, designed with Customer needs in mind and delivered in faster-than-ever delivery times.

This commitment is supported by the Company's move to assemble the latest generation machinery in the world-class manufacturing sites both in Europe, as well as in China, with the same attention to detail and quality, reliability and performance guarantee that Itema Customers look for when they purchase Itema machines.

Itema Group is present in China since 2003 with extensive sales and after-sales teams, world-class production and assembly facilities with a mission to ensure the highest possible standard of weaving solutions and a complete product and service offering available for all Itema Customers.

A TOUCH OF DORNIER

"Quality creates value" – when it comes down to safety and precision, the DORNIER rapier weaving machine is unequalled. With technical woven fabrics produced from glass, carbon and aramid and also in the airbag field, it has served as a reliable tool for pioneers and market leaders for 40 years.



Quality creates value

DORNIER WEAVING

www.lindauerdornier.com

Lindauer DORNIER will present three market-leading machine concepts for the production of highly sophisticated fabrics. Each of these machines will prove its performance capability through the production of especially demanding fabrics in compliance with DORNIER's basic principle "Quality creates value". A focal point will be comprehensive solutions for "green technologies".

DORNIER will present a further new type of rapier weaving machine for the first time. The new P2 type TGV combines the reliability of the previous P1 PTV model with the future-oriented modular P2 machine concept. With a reed impact of 3.7 tons, a special reinforced cloth take-up in sturdy design and absolute filling insertion evenness, the new weaving machine generation shows its technical superiority, especially when producing high density filter fabrics. The fabrics produced maintain constant mesh counts per cm2 and are therefore completely homogenous. This, together with the density, is a basic demand on a high-quality filter fabric which the P2 manufactures in heavy duty design at the ITMA Asia.





DORNIER air-jet A1 with DORNIER SyncroDrive®

Apart from that, DORNIER will show an air-jet weaving machine of the latest generation A1 type AWS. It produces a suit fabric made of highquality wool as used by worldwide leading fashion houses for the menswear sector. Special highlight: The suit fabric with a yarn from Südwolle Group, of Chinese production and designed by the Chinese Shandong Ruyi, is already being produced in China on DORNIER weaving machines. The special challenge here is to produce a fabric with this quality whilst meeting the most demanding requirements with high productivity. The DORNIER air-jet weaving machine achieves this with a gentle filling insertion ("senza pelosità", i.e. no fabric hairiness) combined with automatic filling break clearance. And in industrial use it weaves with a speed of up to 1,000 rpm.

The heart of the DORNIER "weave-by-wire" technology is the patented drive concept DORNIER SyncroDrive®. It is a very low maintenance weaving machine drive based on servomotors without clutch-brake unit.

At the **Stäubli** stand, an air-jet weaving machine type A1 produces an airbag fabric "one piece woven" as a hollow body. This very special demand is mastered optimally by the Jacquard weaving machine with its very high flexibility. 12,228 lifting hooks are used here. The machine has the patented DORNIER SyncroDrive® fitted as standard. During Jacquard weaving with the DORNIER SyncroDrive®, the weaving machine and Jacquard machine have separate drives and servomotors whereby the cardan shaft is not required.

As one of the world's leading weaving machine manufacturers, **Picanol** (Hall H3, booth C20) has always had a very close relationship with the Chinese textile industry. Beginning business in China already in the early 1950s, in 1994 Picanol has set-up PST, Picanol Suzhou Textile Machinery Works, thus starting its career as a Chinese textile machinery manufacturer. PST was Picanol's first production line outside Belgium, and the technology and organisation were based entirely on the assembly concept employed at the company's headquarters in Ieper. Today PST houses a complete production unit with 3 assembly lines for 3 product types (GT-Max, GTMax-i with rapier technology and the OMNIplus-X with airjet technology), a mechatronics division, a sales, service and spare parts organization. Machines produced in PST aim at the top layer of the mid segment and are besides in China, also quite succesful in the new emerging textile regions outside China. The Belgium produced machines are built for the top segment.

On the fair Picanol will present a wide variety of weaving machines, both airjet and rapier. In total 9 Picanol machines will be on display, of which six on its own booth. The highlight will be the OptiMax-i, for the first time on display in the Asian continent. The first OptiMax-i 4-R 190 will weave a fancy denim to show the top performance achievable with this new machine. The second OptiMax-i 12 - J 190 will weave an upholstery fabric.

Two other rapiers on display: one GTMax-i 190 cm (weaving a shirting denim) and one in wider width version of 340 cm (weaving a deco fabric). Picanol will demonstrate that the narrow width GTMax-i in the new execution, thanks to the technological evolutions, again sets the standard for denim as well as shirting fabrics.

As for the airjet machines 2 OMNIplus Summum and one OMNIplus-X will be shown. The OMNIplus Summum 6-R 190 weaving a shirting fabric is equipped with a high speed dobby. It combines performance, flexibility and energy effectiveness. Waste control and style changes are simplified thanks to the Blue22 EasySet prewinders. And the OMNIplus Summum 4-P 280 weaving a sheeting fabric brings the answer to the increasing demand to weave sheeting fabrics on a type 280 at the highest speeds thanks to the air tucking version for continuous reeds. And

Furthermore one Picanol OMNIplus Summum with jacquard will be on display at the Bonas booth and one OptiMax-i on the Stäubli booth.







PICANOL OptiMax-i 4-R 190

As a technological market leader, Picanol constantly invests in R&D to assure the highest performance of its weaving machines, both for new machines and for those already installed in the field. For each new product development launched on new machines, the Picanol aftermarket team investigates how the new feature can bring a solution or benefit to get the most out of the weaving machine. Also the after market upgrade possibilities will be presented on the Picanol booth.

Stäubli will be presenting a selection of its most modern products dedicated to the specific requirements of the Asian market, as well as to the worldwide weaving and knitting industry.

Three complete Jacquard installations with different types of weft insertion will show their quality weaving capacities at the two-level Stäubli booth featuring excellent vision on the whole machinery.Two set-ups showing the re-engineered Jacquard SX and LX machines will be weaving terry cloths and upholstery on rapier weaving machines. On another set-up with air-jet weft insertion the production of OPW airbags will be demonstrated by the Jacquard machine LXL for heavy payload with a weaving width of 280 cm. While the set up at the booth is equipped with a Stäubli harness with 12288 cords, this machine offers the possibility to achieve formats up to 36'864 by combining two machines in a tandem set-up.

In addition Jacquard weavers can discover the redesigned version of the highly appreciated Jacquard machine DX, especially dedicated to the requirements of Chinese weaving machines. As redesign at Stäubli goes with improvement of capabilities and characteristics, keeping always in mind the increase of the weaver's ease and production performance. The machine will be showcased in combination with different types of Stäubli harnesses for most versatile applications.

As a novelty, Stäubli will be presenting newly developed dobbies S3062/ S3061 for water jet applications. These dobbies feature the sophisticated Stäubli rotation principle with high-end locking system of the 3rd Stäubli dobby generation. On the weaving machine they can be installed in high position with the new harness motions de82/83 for high-mounting, offering e.g. maintenance free bearings. To complete the picture of Stäubli shedding systems, further upgraded dobbies as well as refined cam motions are being demonstrated at the booth. The new mobile automatic drawing-in machine SAFIR S40, dedicated particularly to cotton weaves like denim and other standard fabrics, will be operating on the booth. With its unique and compact format it can fit in any traditional weaving mill. Like all of the SAFIR family members the S40 offers unequalled features like double end detection.



In addition at the Stäubli booth exclusive carpet samples woven on ALPHA 400 and 500 Series, some with the recently developed "Magic Shadow Effect" or the "Traditional Carpet Effect", can be seen.

At the separate booth D15 in hall 4 Stäubli with its brand DEIMO is showing two circular sock knitting machines in operation, featuring the automatic toe-linking device D4S, and which is driven by the controller 2900 SL. Visitors can see as well a selection of electronic control solutions, input/output devices, and related programming tools mainly for the textile industry. KARL MAYER will exhibit its latest innovations in two locations simultaneously, i.e. in hall 4.1, stand A 30 in the National Exhibition and Convention Centre in Shanghai, and simultaneously at an in-house exhibition at KARL MAYER (China) in Wujin. A free shuttle service will be available between the two locations.

KARL MAYER's Warp Preparation Business Unit will be showcasing an innovative sectional warping machine for processing shirtings and cloths. This machine operates at an impressive level of productivity. It improves efficiency in weaving preparation by up to 30% and by up to 3% in weaving compared to other models on the market. KARL MAYER will also be showing the innovation Size Box HSB with pre-wetting. The key feature of the PROSIZE® sizing machine operates with three highly turbulent application zones based on spraying technology, and offers many advantages compared to the immersion bath process. Savings can be made in sizing additives, energy consumption during desizing, and effluent loads, and the uniformity of the size application is improved.

In the tricot sector KARL MAYER continues the generation change that has been initiated at ITMA 2015 in Milan. There is a high demand for the first model to feature the upgrade, the HKS 2-SE, with a modern machine design, KARL MAYER's new KAMCOS® 2 platform with additional App functions, camera monitoring system and the LEO® Low Energy Option for up to 10 % less energy consumption, reducing costs and environmental loads. HKS machines with EL provide simple and rapid pattern change for producing short runs and development of new products. An almost limitless range of long pattern repeats, and consequently pattern designs, can be produced.

Lust but not least warping machine that can be used for conventional direct warping as well as sectional warping will be shown. The warp-for-warp technique requires only a few packages.

This saves space and offers maximum efficiency when producing short warps for product development, when using expensive yarns for processing production warps, and when processing small batches.

The KARL MAYER Technical Textiles Business Unit will focus on the subjects of lightweight construction and geotextiles. The visitors will be presented with a range of impressive examples of applications and all the relevant information.



Groz-Beckert (Hall 4 / Booth D29) will be presenting products and solutions across the entire textiles value chain. For knitting they present the "transparent" large circular knitting machine, with a gage gradient of E10 to E50. Two other "transparent" machines from the flat knitting and warp knitting fields will round off the product presentation. Another highlight is the litespeed® plus needle. It impresses with its optimized needle geometry, which increases the service life, reduces oil consumption, reduces the machine temperature and leads to energy savings of up to 20 percent.

Products from the Weaving segment ranging from healds, drop wires and heald frames, to machines for weaving preparation. The WarpMaster fully automatic drawing-in machine and various tying machines from the KnotMaster range will be presented. A transparent weaving machine will be presented, too. The jacquard heald, a new addition to the Groz-Beckert product range, will be a special feature at this trade fair exhibit.

Of course there also will be all types of needle innovations for tufting and felting. For example the GEBECON® and the EcoStar® needles. And there will be more innovations like Loop Control® technology, the gage part system, a knowledge database for sewing technology, a newly developed product catalog and the INH quality management.

KARL MAYER HKS 2-SE



VANDEWIELE (Hall 3 – Stand 01) will present machinery and technology for its 4 application areas: flooring, home textiles, apparel and technical textiles. The Vandewiele-Cobble tufting machines will present the Myriad and TuftFX machines. In the field of carpet weaving a highlight will be the RCE02 Rug & Carpet Expert carpet weaving machine. This is the newest generation of double rapier face-to-face carpet weaving machines, equipped with a new Jacquard machine and Smart Frames. A particular successful machine of Van de Wiele in the Chinese market is the MAX91: the axminster carpet weaving machine, combining high productivity with superior carpet quality.

In addition there will be presentations about the BXE: BCF extrusion line for carpet yarns. Bonas will introduce during ITMA Asia the 'Ji' Range. The 'Ji' is available in formats from 1920 hooks till 5760 hooks and is the most compact machine on the market. And Superba has developed a unique and performing heat-setting system based on saturated steam. **Stoll**, for the first time, will present the prototype CMS 330HP W multigauge in the area of knitting machine technology. This type of machine is the suitable answer for the special technical requirements of shoe-fabrication. Further machines will be exhibited include the ADF 530-16 multi gauge, ADF 530- 16 BW, CMS 502 HP+ multi gauge and CMS 520C+ multi gauge. The ADF-technology has many beneficial features, one of which is the implementation of body-monitoring functions (pulse, heat, temperature) into the knitted piece. Some examples of intelligent fabrics are jogging bras and the award-winning Balaclava – a face mask for special demands of athletes in the winter time. The area of Technical Textiles will show a unique interesting prototype – a chair coat knitted with a CMS 330 HP W multigauge machine.



STOLL CMS 520C+ multi gauge

The German knitting machine manufacturer **Mayer & Cie.** will show the OVJA 1.6 EE and the MSC 3.2 II. Mayer & Cie.'s spinitsystems spinning and knitting technology will be represented by an info stand. The MSC 3.2 II Single Jersey machine with its technology based on that of the S4 3.2 II, was specially developed for the Chinese market. It is assembled at Mayer & Cie. China.

The OVJA 1.6 EE, a Jacquard machine with double electronics is much in demand for the manufacture of, for example, high- quality mattress cover fabrics, in the creative fashion industry and for knitted footwear.

Benninger (Hall 6 / Booth E31) will show the manifold possibilities of washing based on a TRIKOFLEX washing compartment.

The German textile machinery manufacturer **BRÜCKNER** (Hall 6 / Booth E01) shows their orientation towards their customers and the future and presents mainly new developments and products concerning the sector of woven fabrics. BRÜCKNER offers among other things sanforizing lines, continuous dyeing lines, infrared dryers, relaxation dryers, compactors and stenters for coating, drying and heat-setting.

Highlight is the POWER-SHRINK Sanforizing line for the finishing of woven fabric. This rubber belt compacting line allows the sanforizing and compacting of very different types of woven fabrics. Finishing on a sanforizing line gives the fabric a more stable structure, a silky shine, a smooth hand and minimum residual shrinkage values.

Typical end products are fabric for shirts and trousers, jeans, bed linen, working clothes, home textiles or upholstery material. BRÜCKNER offers single or double sanforizing lines and combinations with felt calenders depending on the product and the customer's requirements.

With a continuous dyeing line by BRÜCKNER the customers will achieve uniform and reproducible dyeing results. The lines ensure a crease-free fabric flow without shading and migration. The symmetrical structure of the air circulation zones prevents a different shade on the two fabric sides. In addition the installed power is adapted to the low air flows required for dye drying which leads to a considerably lower energy consumption. Typical end products dyed on BRÜCKNER lines are fabrics for shirts and trousers, working clothes and home textiles.

Continuous research and development efforts have made BRÜCKNER machines today even more efficient and increased their service life and support the customers in minimizing their ecological footprint. Only one example: an indirect gas heating system has been developed particularly for the finishing of knitted fabric, which saves in combination with a special heat-recovery system energy and prevents the yellowing of the fabric. And BRÜCKNER developed a new minimum application unit. This application unit works with a minimum liquor tank of approx. 2.5 l for each m of working width.

The minimum application quantities require in the following processes (for example drying or curing) clearly less water evaporation which has a positive effect on the energy requirement at the respective dryer. BRÜCKNER also offers the possibility of retrofitting for example a heatrecovery or exhaust air cleaning system.



BRÜCKNER POWER-SHRINK

Mahlo (Hall 6 / Booth A23) will introduce latest technologies in textile finishing and drying processes. On display will be a working demo plant with the new generation of weft straighteners Orthopac RVMC-15 and Orthopac MFRC-15.

Monforts (Hall 6 / Co1) will present a wide range of new products and solutions, continuing its aim to ensure energy savings and other sustainable benefits. The booth is incorporated into the joint CHTC Fong`s presentation.

The company will present its latest developments for heat recovery and exhaust air cleaning following the trend towards further reduced energy consumption and the growing demand for exhaust air purification. The new Eco Booster is also available as a retrofit version for installation on existing stenters or as an integrated version into the new Montex 8500 stenter. Low maintenance and no standstill times, due to automatic cleaning processes, are the key benefits for Monforts Eco Booster.

An exhaust air cleaning unit can be directly linked to the Eco Booster heat recovery unit. Smell and visible particles in the air will be extracted by this system. VOC`s (volatile oxygen compounds) can be filtered out with an additional UV-C system.

Monforts will also present its latest modules for coating. The recently acquired TImatec company has already resulted in first orders from Italy, Germany, Mexico and Colombia. Cut models of different coating options will be on show for 'Knife over Air', 'Knife over Roller', 'Magnetic Knife' and 'Screen Printing' versions of coating units as well as the multifunctional unit incorporating all options into one most versatile unit. Special focus will also be given on Monforts competence in Denim Finishing Ranges especially featuring the new 'Eco Denim' range and the High Speed Denim Finishing version.

Monforts Technologists for continuous Dyeing and Technical Textiles will be available on the exhibition to for provide detailed advice.



soft-TRD SIII has been specifically developed to meet the requirements of stringent international and local environmental protection regulations with simultaneous consideration of its economic efficiency.



THIES soft-TRD SIII



MONFORTS Eco Booster

SETEX (Hall H6 / Booth E07) makes Industry 4.0 potential accessible in textile production and will demonstrate the new SETEX OrgaTEX X1 system which provides entire new possibilities to realize an efficient digital workflow. The root-data management deals with all kind of informationtypes and attributes used in modern textile enterprises, including maintenance, energy or efficiency information. The process and recipe module received a concept of using smart collections of recipe and process segments.



SETEX OrgaTEX X1

TEXTECHNO Herbert Stein (Hall 1, booth E18) and their subsidiary company LENZING INSTRUMENTS introduce the latest testing instruments for fibres and yarns. The focus will be on the enhanced fibre bundle length and strength tester FIBROTEST, the Micronair Station FMT, the microdust-, neps-, trash-, and fibre-length tester MDTA 4 as well as the new automatic capacitive evenness and count tester for slivers and rovings COVASLIVE.

AUTEFA Solutions will inform about energy saving technologies. The Solutions V-Jet, is a new hydroentanglement system which saves up to 30% of the hydraulic energy required for the Spunlace process. The patented Jet-strip design enables a pressure reduction while keeping the tensile strength constant in comparison to a standard Jet-strip.

The Spunlace process is optimized with the Square Drum Dryer SQ-V, which has a significantly better energy efficiency and drying performance than a common Drum Dryer – at the same footprint. In regards to efficiency and sustainability fiber and material recycling is in focus. The Tearing Machine UniRec is based on a modular design with additional available opening units. UniRec opens a large variety of nonwovens and textiles, even such made of Carbon fibers, while maintaining an adequate staple length of the fibers. With the Automatic Needle Exchanger 2.0 AUTEFA Solutions has a unique service machine for every needle loom. The Needle Exchanger enables a fully automatic process of needle rotation and exchange without manual intervention.



AUTEFA Solutions Automatic Needle Exchanger

The Web Master FUTURA card is specially developed and designed for high production speeds, tailored to the worldwide requirements for Nonwoven Lines.Furthermore AUTEFA Solutions offers a complete recycling process for carbon waste, including opening of fabrics, web forming and web bonding, this being able to supply turn-key lines to create carbon nonwovens out of carbon fiber waste. And AUTEFA offers a new hydro laced airlaid process lines which was developed by partnering with Campen machinery.

Trützschler Nonwovens puts emphasis on machines and concepts that are particularly sought-after in the Chinese market. For nonwoven installations, the joint development with Trützschler Spinning includes bale opening, high-precision and simultaneously high-productive weighing units as well as the advanced conveyor belt with blending opener.

One innovation will be structured nonwovens from the thermobonder . A patent-pending, exchangeable structuring shell allows the production of bulky webs with permanent 3D structures during bonding in the through-air thermobonder.

Hydroentangled wipes are often produced on large systems. For this area of application, Trützschler Nonwovens developed the master roll winder SkyWind. Equipped with surface drive, it is characterised by robustness, simple operation and high availability.

And last but not least Trützschler Nonwovens will feature the wet-inwet process for nonwovens with special characteristics. Flushable wipes, standard cleaning cloths, coating substrata and technical felts are only a few examples of the end uses for wet-laid and hydroentangled webs. Meanwhile the second Voith-Trützschler system has been successfully put into operation in China.

Trützschler CARD CLOTHING is presenting in the area of Nonwovens the new NOVOBOND clothings. The use of this clothing on the condensed roller is recommended when processing PES and PP with CV blends. Groz-Beckert carding segment' focus will be on a synthetic doffer wire for carding fine to extremely fine fibers. It has a high tooth density and a special geometry. Even abrasive materials like matt synthetic fibers can be processed with the synthetic doffer wire D40-30-52C CBF. This brings us to the end of our preview of the ITMA Asia + CITME 2016. A brief glance at the exhibitors and, above all, the machines shows that all the exhibitors will be presenting their latest innovations in Shanghai.

This represents a major break with

tradition: at previous events, it has been common practice to showcase lower-priced alternatives intended specifically for the Chinese market. The exhibits demonstrate that the machine builders are well prepared for the transformation of the Chinese textile industry and that there is a degree of expectation on their part that the transformation is about to gain momentum.

This is creating somewhat of a buzz, which is generally a very good sign for a trade fair aimed at transforming the textile world by means of new technology.

Viewed from a broader perspective, it is fair to say that the resounding success of last year's ITMA has generated high expectations and that, at the ITMA Asia + CITME 2016, Asia will be demonstrating whether it intends to maintain its prominent global position in the textile manufacturing industry or indeed strengthen it. This would require Asia to have the best possible technology at its disposal.

However, this consideration will no doubt be of secondary importance for the individual textile companies. Their main priority will be to derive maximum benefit from the visit and to find an optimal way of satisfying their own requirements in line with the overall strategy. Importantly, companies will have to start thinking in terms of ROI and TCO as opposed to price. Viewing and testing the best technology and discussing customised solutions with the machine builders will be the key to success.

We hope all those attending the fair will gain maximum benefit from their visit and be impressed by the innovations on display. For our part, we are looking forward to gathering some first-hand information about them and will keep you posted via our numerous information channels, such as our INFOLETTER, website and Twitter account.

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Interview with: Mr. Fritz Legler, Vice President Marketing, Sales & Service, Stäubli

BLI

We are guided by the Stäubli slogan "fast moving technology" because innovation is one of our prime concerns. When we think of Jacquard looms, we think of Stäubli, and the importance and variety of Jacquard power looms are still growing even after 200 years. The fabrics and applications range from the finest silk weaves and original decorative fabrics made of velvet, to highly elaborate, technical applications. Currently where are the biggest trends in Jacquard weaving? In which segments do you see above-average growth?

Mr. Legler: Over the past one to two years we've seen rapidly increasing demand around the world for high-quality, interesting Jacquard fabrics and for the machinery to produce them. We are pleased that weaving mills recognize the decisive advantages of our Jacquard machines – such as the robustness and reliability even at very high production speeds – and these play a decisive role when it comes to investment decisions. Modern Jacquard weaving mills rely on our high-performance Jacquard machines and the service the mill receives even after the machines are commissioned. In European weaving mills we are currently seeing a significant upswing in the field of high-quality Jacquard fabrics for suits and fancy clothing but also for household textiles such as premium towels in dense and heavy loop-pile quality.

Stäubli offers a large and diverse product portfolio for Jacquard weaving. There are the SX, LX and LXL Jacquard machines plus the UNIVAL 100, as well as specialised machines for velvet, narrow textiles and labels. We can therefore conclude that Stäubli can offer the right solution to meet any customer's needs. *Is that the case and can you give us an example of a particularly original requirement?*

Mr. Legler: Our Jacquard product range is very broad, and this allows us to comprehensively meet the needs of our customers. This gives weaving mills the chance to cover their machinery needs virtually from a single source, and thus to conveniently benefit from optimum service and support. Our machines, whether the SX, LX or LXL, each cover a specific but very extensive range of applications – yet they remain flexible and are available in a variety of optimized formats. The flexibility and performance of the machines can be increased by using them in conjunction with our harnesses, which are also made to customer specifications and to suit the application.

As an example, I should like to point out our presence in the field of African damask production, which might not be an original application but is nevertheless a very interesting and challenging one. High-quality fabrics with beautiful patterns are being produced every day on a large number of brand-new Stäubli Jacquard machines in the German-speaking countries and successfully being delivered to the major markets in Africa. This example clearly shows that it's worth investing in our machines in Europe too. At ITMA in Milan you presented the new Jacquard machine LX for weaving flat, terry and technical fabrics. What's new about it and what makes this machine particularly interesting for weavers?

Mr. Legler: Regardless which fabrics our Jacquard weaving machines are being used for – whether premium apparel fabrics, silk upholstery fabrics, terry cloth, or technical products such as side airbags – every weaving mill has the same requirements: The production machinery must be more powerful, absolutely dependable, and simple and intuitive to operate. Maintenance requirements should be kept to a minimum to keep the associated costs low. Also, low energy consumption is very desirable for economic and ecological reasons. Responding to all of these criteria and the technical challenges are our new series of Jacquard weaving machines: the SX, LX and LXL series.

The LX Jacquard machine, available in various models with up to 6144 hooks, now has an improved lifting motion that allows production of even the heaviest fabrics on weaving machines at high speeds. The new models can handle loads up to 26% higher than the previous models, thanks to the new coaxial cam and resized support frames and bearings. The fans are strategically positioned in the housing for optimum air circulation inside the LX. This keeps the inside of the machine clean and keeps temperatures under control.

At ITMA Asia + CITME in Shanghai you'll be displaying your state-ofthe-art technology with complete installations of the SX, LX and the LXL Jacquard machine. And in addition, a new version of the DX machine, purpose-built for Chinese power looms. What do you estimate the demand to be? Do structural changes in China now call for absolute high-tech, or do you need to offer a broad spectrum to meet all requirements?

Mr. Legler: The structural change will bring out the best in China. Especially the visionary and quality-oriented mills will survive and thrive. It will likely be another case of Darwin's famous "survival of the fittest" theory applying not only to nature but also to business. However, China of course will remain a large and strong textile force even after the change. For the change itself, China needs excellent technology and reliable partners. That sounds very much like Stäubli, so in this respect we find ourselves well positioned. Regarding our portfolio, I can say that the demand in Europe and China for innovative Stäubli technology for the local weaving machinery market will remain intact. The end consumers will determine the breadth and the depth of the local textile offerings of our customers – whether for export or local markets.

What are your expectations for the ITMA Asia + CITME given the very high visitor numbers to ITMA last year?

Mr. Legler: We expect a very great number of visitors at ITMA Asia, and the interest from Asian customers will be high. For one thing, we are unveiling a completely new innovation: the S3062/S3061 rotary dobbies. This is the third generation, for water-jet weaving machines; the S3000/S3200 series was previously usable only with air-jet and rapier machines. In addition, we will be emphasizing the capabilities of the Jacquard machines I mentioned earlier with some interesting applications, and this will certainly convince many visitors. We are looking forward to having interesting talks with our customers and many potential new customers.

The trend worldwide as well as in China is continuing towards automation, and for many years, particularly in weaving preparation, Stäubli has been offering very innovative solutions with the automatic drawing-in machines SAFIR and DELTA. At the last ITMA Asia + CITME you exhibited the S30, at ITMA in Milan you revealed the S60 and the mobile S40, and now you are also going to show the S40 in Shanghai. What makes the S40 particularly interesting for Asian weavers?

Mr. Legler: The SAFIR S40 is ideal for cotton, and here we also have to stress denim applications, because these markets are very important in Asia. The machine offers several essential key advantages: Capacity is boosted by reducing the idle times of the weaving machines.

That's because automatic drawing in is not only faster but also results in better quality than manual drawing in. This of course improves the weaving process, which is interrupted less often, and ultimately enhances the quality of the final product. And there's also less second-quality output.

The market also demands increasingly faster style changes, and here too automatic drawing in supports weaving mills thanks to the same qualities I already mentioned.

The SAFIR S40 drawing-in machine is very interesting because of its design. It's very compact, consisting of a mobile drawing-in machine and one or two stationary drawing-in stations, and it can be configured as needed and to suit the available space.

It's also important to mention the short ROI time. Depending on the configuration and the size of the weaving mill, an investment in such a machine can pay off as quickly as one to three years.

Development on the dobbies and cams is also constantly progressing. For example, the electronically controlled S3000/S3200 rotary dobbies which are already third generation models, have again improved in terms of reliability and are designed for maximum output. How are these characteristics further improved? What technical innovations are they based on? **Mr. Legler:** Stäubli invented the rotary dobby many years ago, essentially revolutionizing dobby design. The principle has proven so successful that it has been steadily refined over the years, and recently the new electronic dobby family S3000 / 3200, the third generation, has been launched on the market. The new machine type offers decisive advantages over its predecessors; these are especially noticeable with high-speed weaving machines. The newly developed selection system for actuating the frame motion now consists of a locking mechanism coupled to a static magnet beam. This, along with the newly developed transmission type e32/33, makes for less vibration and greater service life, safety, reliability and performance of the latest series of rotary dobbies.

DEIMO and Schönherr also belong to Stäubli. DEIMO really turned heads at ITMA with a world first: the D4S, an automatic toe-linking device for use with sock-knitting machines, is based on the idea of automatically linking socks directly on the knitting machine. Rising productivity with modest investment. That sounds like a star product?

Mr. Legler: That's right, since we presented this device as a product for the OEM market at the ITMA in Milan under our brand name DEIMO knitting solutions, we have been enjoying very strong demand.

And Schönherr also attracted a lot of attention at ITMA where it presented the new Alpha 500. Carpet sizes of up to 5.3 m web width. A machine with maximum flexibility and productivity. Large variety and innovation in carpets. In addition to that: the new "Magic Shadow Effect", which makes it possible to create amazing designs for monochrome carpets. How enthusiastic are carpet manufacturers about the Alpha 500?

Mr. Legler: The ALPHA 500 series has been very well received by our customers. They highly appreciate the integrated technologies such as the toothed-belt-driven servo-controlled cutting knife for flat carpet surfaces and minimum warping waste and the high-performance Jacquard machines, as well as the great flexibility these machines provide. Today, for example, the ALPHA 500 XHDC is a greatly valued machine in the Iranian market because it offers the possibility of weaving high-density carpets with up to 3 million points per square metre. And with the optional TCE (Traditional Carpet Effect), mills are astounding their customers with carpet backs that give even experts difficulty in distinguishing with the naked eye machine-woven carpets from hand-tied ones.
Stäubli machines are known for their excellent service life and even after many years are still very productive. Is there perhaps an interesting story about a particularly old treasure?

Mr. Legler: Let me tell you about a 2232 series rotary dobby that was put into operation before 1985 near Lyon in south-eastern France. It has been in service there ever since in a mill that specializes in industrial cleaning textiles, such as floor-cleaning wipes for hospitals or office buildings. This dobby, which can be equipped with up to twelve frames, is a good example of how robust and future oriented Stäubli machines have always been. Because being able to profitably and successfully weave such applications in Europe today requires from the outset not only weaving experience and entrepreneurial spirit but a machine that works like a reliable and economical partner, one whose properties are optimally suited to the products being woven – both now and in the future. And to top it off: Stäubli supports this weaving mill – as it does all of its customers around the world – of course with replacement parts, and still offers training for this machine as part of its comprehensive service programme.

What will high-tech weavers be producing in 2020, and which Stäubli machines are absolute must-haves in order to remain competitively viable and successful?

Mr. Legler: Mills will still be weaving all sorts of textiles in 2020 because there will simply be more people living on this planet who will need fabrics in every field, from clothing to table and bed linens and technical textiles as well. More people simply translates into increased production, but environmental and water protection must also be ensured.

Stäubli demonstrates its environmental responsibility in the context of this highly controversial textile industry by providing machines that support sustainability with lower power consumption and longer service life and that are manufactured in factories where environmental standards and recycling are not foreign words but everyday practices. And we are guided by the Stäubli slogan "fast moving technology" because innovation is one of our prime concerns. In 2020 and beyond, we will continue to keep our present and future customers satisfied and industrious!



"It is important to have courage because sometimes you go against the tide."

Interview with: Mr. Paolo Gnutti R&D Head of ITV DENIM ITV Denim is a 44 years old completely vertical company from raw cotton to the finished garment, with production at your own factory in Italy. What makes ITV Denim special, what is the USP of the company?

Mr. Gnutti: What makes ITV special is surely our synergy with customers in order to develop new collections, a very high level of quality production and an R&D always on the move that allow us to propose new moods to our customers every month. Moreover, we have an extraordinarily competent and skilled team that allows us to follow our customers in every step of the 'production chain'.

A couple of years ago the denim industry lost market shares to other apparel industries like for instance sportswear. Now, during the last years, the denim industry fights back. With a high number of new fiber blends and textile manufacturing processes linked with creativity the denim industry is able to offer a broad portfolio for new markets like home dresses or sportswear. How is the mood in the industry and what are your expectations in the future of denim?

Mr. Gnutti: In recent years the Premium Denim market, our relevant market, has gone through a transformation. We believe that this market was completely airtight in respect of "less evolved" manufacturers (I mean in terms of quality and offer range). However the market literally "opened the door" to these producers diverting productions spaces that were fundamental for us and, on the other hand, impoverishing the final

product. This process generated a loss in terms of sales volumes and for our supply chains forcing us to explore new market segments with a new offer centred on a 'technical denim' that guarantees also high performances. We've entered in a market that goes from snowboard suits to motorbikes, from fitness to yoga from tailoring to basic. This is our positioning for the future: denim explores new fields but with the same determination.

What would you say are the biggest trends for denim fabrics and apparel?

Mr. Gnutti: Our sector has a lot of differences, encompassing many fields, and for this reason our collections should be designed and developed with a 360° approach in order to fulfil the needs of every market. A constant effort in research and a study of what exists give us the change to offer what is not available on the market yet; our collections are born out of passion, exploration and curiosity, all elements that make our work more like a game.

As a fully integrated mill you must be innovative all along the textile value chain from spinning to laundry. Why Is this anyway an advantage for ITV Denim?

Mr. Gnutti: Our 'global' expertise in the chain of the finished garments allows us to help and support our customers during the whole production process, from selection of the fabric to ironing. Today our priority is and must be customer care and an efficient after-sale service.

R&D is fundamental for every company in any industry. However, what makes *R&D* in particular for the denim industry and your company so important?

Mr. Gnutti: Every company that is in the fashion market as well as in the electronic or food sector, owes its success to the offers that is able to put on the market and to the ability to reach its final consumers' needs. The R&D department has this duty, I mean to give always fresh and new ideas and propositions, developing an offer that must be innovative, simple and marketable.

What would you say are the most important innovations in technical processes within the last three years in denim industry?

Mr. Gnutti: We have tried to develop products, starting from yarns, that could eliminate problems during the production process, having higher performances as regards elasticity and resistance. High concentration dyes in order to obtain as starters very dark tones that will allow multiple aspects on washings but with a incredible rapidity for the final effect, saving a lot of water.

With the latest collection of ITV Denim you have presented at MunichFabricStart you serve all major trends. What have been the favorites of the visitors?

Mr. Gnutti: The German market is one of the biggest markets for us in terms of sales. It is a very demanding and competent market that during these years has rewarded our quest for excellence. The latest collection was presented in Munich and had extremely positive feedbacks, concerning in particular the 'super-stretch' fabrics but also the 'Ready for dyeing' ones, 'super-soft' and technical fabrics. And then, as usual, there is fashion that is our 'crowning jewel'.

In 2014 you have worked with the designer Jonathan Christopher and have won the Global Denim Award. The idea behind the competition is to pair the world's premier denim mills with emerging designers. You have taught Jonathan in all processes and possibilities of ITV Denim's production and he paid back with a winning collection. Is this a regular form of cooperation for ITV Denim or what are your processes for design and creativity?

Mr. Gnutti: We have worked with Jonathan Christopher during all the developing phases of the collection, starting from his ideas and developed them in a specific collection designed according to his vision, a collection that was awarded the GDA and was shortlisted for the Woolmark Prize.

It was a great honour to collaborate with Jonathan because he is a very talented and innovative designer.

The same can be said for the collaboration with Alexandra Frida; however for us is almost a habit to have these close collaborations with our customers, in fact we always try to understand their needs and to develop them in collections that are designed and personalized for every single customer.

Sustainability is a mega trend or change of paradigm which strikes all industries. What makes it one of the most important topics in particular for the denim industry? Is there a lot of pressure in the market from big brands and retailers? Or is it because sustainability will become more and more important for consumers and therefore denim fabric producers have to stake their claims in the new markets of the future?

Mr. Gnutti: Of course sustainability is and always was a fundamental issue for denim production and in general for every brand. Obviously, ITV being a 100% Italian company located on the border of one of the biggest Italian national parks, sustainability is a crucial issue for us. However, even if we were located elsewhere, this would be the same. Being sustainable should not be an option or a choice, but it should instead be mandatory for everyone. Respecting the planet today will shape a different future for the new generations and we have the duty and the obligation to leave to our children and our children' offspring a clean and safe environment. In my opinion this working 'ethic' still has to find an important feedback from the market.

I often participate in 'round tables' about sustainability, energy and water saving. All these ideas are good, however I ask the Brands: are you ready to progress from round tables to the market, and then to final consumers, with an Eco product that is also an Ethic product? Price cannot and must not be the only rule of this game.

You are using sustainable processes and also develop them. Your exclusive WINETEX[™] technique, where use is made of coloring from waste in the wine supply chain to dye fabrics seems to be a major innovation. Would you be so kind and explain how it works? Is it right that the WINETEX dyeing process is absolutely natural and no chemicals are used?

Mr. Gnutti: WINETEX is the only fabric created with a 100% natural dyeing process using waste from the wine supply chain. It does not use chemicals and it does not require any aggressive products during the washing phase. This dyeing technique changes its final result simply by varying water temperature and pH obtaining different colours and effects in one product.

Are you using this process for the whole range of articles of ITV Denim or are there still some Indigo dyed denim fabrics within the collections? If yes, why?

Mr. Gnutti: WINETEX was developed in a 'Capsule Collection' consisting of rigid and stretch fabrics.

Today the majority of our collection is still developed through indigo fabrics, even if in the last collection we have developed a line completely dyed with sulphur colours. The market still requires indigo for common use, but we will continue to develop more and more collections using natural and sustainable dyeing techniques. There is still much work to do in this direction but we are sure that there will be more and more space within brands dedicated to sustainable dyes.

You are also very active in making the washing process more sustainable. For instance in July you offered a washing seminar in Los Angeles for your US customers with a focus on sustainable washing. What are the reasons behind events like this and what makes them successful?

Mr. Gnutti: Every market presents different needs and demands. California for many years had a problem regarding how to get and use water. Offering a workshop where water is used at bare minimum or sometimes not at all during the washing process was a specific need of that market. However not only for them. Water is a very important resource for everyone, and we must use it carefully, trying to avoid its waste as much as we can. Our purpose is to help our customers on every market, working with local laundries and with leading chemical companies in its market, to understand their necessities, with a view to solving and improving working conditions. This is a message that we intend to communicate globally. In October, for instance we will repeat this experience in Germany. The so-called "GLOBETROTTER DENIM" will be one of our continuous commitments in order to offer to the market new instruments to preserve the earth using less water and developing more and more ecological products, accelerating industrial washing using new techniques.

Finally a more personal question. Why do you think working in the R&D of a denim mill is a lovely job?

Mr. Gnutti: I grew up professionally in ITV starting from spinning and going through all production sites, from machines and then in the offices. R&D is not a job that you choose, it is the job that chooses you. Is not enough just to look at the market and see what it offers you in order to take from it some concepts, stick them together and create a product.

I must say that the technical side of this job is fundamental in developing the products, for example the yarns that you choose, its thickness, its length, the numbers of threads in the chain, the loom settings and the loom heights, the weft for thread count, for elastomers and for beats. You must have a deep sensitivity to catch all the differences, details and try to see what most people don't see; moreover it is important to have courage because sometimes you go against the tide. In the end I can definitely say that I love my job because it is a beautiful profession, where sometimes time stops and you can try to change the rule of the game.

Cost savings for continuous dyeing with Monforts E Control/T-CA and Eco Line finishing

by Hans Gerhard Wroblowski, Monforts Textilmaschinen GmbH, Germany



Monforts Textilmaschinen GmbH has been active in the textile machinery sector since 1884 and has continuously developed – together with wellknown industrial partners including Dystar, Acroma, Huntsman and Pleva - new technologies, particularly for continuous dyeing and finishing of woven and knit fabrics



In the century of globalisation, it is more important than ever before, to optimise work processes in the textile industry. Today, attention must be paid to quality and production costs without neglecting environmental aspects.

The expected high standard of quality required by the textile market has reached a completely new dimension. This applies to export and domestic markets alike. The ECO Line concept for finishing and dyeing of woven and especially knit goods using Eco Applicator, within the wet in wet technology, is a modern technique which meets these requirements.

Helping the textile finishing industry to achieve maximum results with the minimum use of resources is absolutely fundamental to the Monforts Eco-Line Concept.

This technique offers sustainable cost savings over a wide range of the production work. It also further improves the quality of the fabric at the same time.

To achieve these goals, 'state of the art' techniques of production and technologies need to be exploited to secure market shares in today's world, plus being able to withstand the pressure of price cutting within international competition.

Monforts R&D offers solutions for new products, new and optimised technologies, opening and creating new perspectives in modern fashion as well as highlighting the needs and demands for sustainable production within the industry.



Dyeing

The Eco-Line Concept together with the further developed and refined process E-Control and T-CA Dyeing techniques enables varied colour solutions from light to real dark coloration for knit and woven fabrics.



Eco Applicator for various finishing and dyeing applications

These techniques and processes offer unique effects- improving colour depth and fastness and assures reproduction of shades (tone in tone)

Typical features of the textile industry's environment are greater challenges but also a lot of opportunities. Machinery manufacturers, have to comply with customers', increasing ecological awareness and have to meet the objectives related to sustainability and environmental protection.



The ECO Line technology offers a real potential for reducing processing time and costs, and the initial investment outlay of this innovative system can be recouped very quickly.



Monforts Eco-Applicator



In this edition of our 'Country Focus' series we will be taking a look at a country from Asia which is one of the most important textiles producer of the world, but faced a lot of challenges in the last years. We want to take a look at Pakistan.

Pakistan is a federal parliamentary republic in South Asia. The country has a 1,046-kilometre (650 mi) coastline along the Arabian Sea and the Gulf of Oman in the south and is bordered by India to the east, Afghanistan to the west, Iran to the southwest and China in the far northeast respectively. It is separated from Tajikistan by Afghanistan's narrow Wakhan Corridor in the north, and also shares a maritime border with Oman. With an area covering 881,913 km2 (340,509 sq mi) Pakistan is the 36th largest country in the world in terms of area. Official languages are English and Urdu. **B** y population (CIA World Factbook 2006: 156 million, estimated 200 million), Pakistan is the sixth largest country in the world. The capital of Pakistan is Islamabad (0,8 million people), located in the Pothohar Plateau in the northeastern part of the country, between Rawalpindi District and the Margalla Hills National Park to the north. The biggest city is Karatschi with a population of around 12 million people. Other big cities are Lahore (6,485,175), Faisalabad (2,582,175), Rawalpindi (1,793,197) and Multan (1,471,978).

Pakistan is a federal parliamentary republic with Islam as the state religion consisting of four provinces and four federal territories. It is an ethnically and linguistically diverse country, with a similar variation in its geography and wildlife. It was created in 1947 as an independent nation for Muslims from the regions in the east and west of the Subcontinent where there was a Muslim majority. Initially a dominion, Pakistan adopted a new constitution in 1956, becoming an Islamic republic.

The bicameral legislature comprises a 100-member Senate (upper house) and a 342-member National Assembly (lower house). The Prime Minister is usually the leader of the majority rule party or a coalition in the National Assembly— the lower house. The Prime Minister serves as the head of government and is designated to exercise as the country's chief executive. Current Prime Minister of Pakistan is Mian Muhammad Nawaz Sharif, in office since June 2013. The President who is elected by an Electoral College is the ceremonial head of the state and is the civilian commander-in-chief of the Pakistan Armed Forces.

The current President of Pakistan is the Pakistani businessman and conservative politician Mamnoon Hussain, in office since 9 September 2013.

Now let's take a look at the economy. Pakistan has a semi-industrialised economy with a well-integrated agriculture sector and and is one of the Next Eleven, the eleven countries that, along with the BRICS, have a potential to become one of the world's large economies in the 21st century. In the 2015 GDP rankings for all member states of the World Bank, Pakistan is in 40th place with 269,971 million US\$ and contributing 0.3 percent of global economic output, just ahead of Chile and just behind the Philippines. The country's per capita GDP in 2015 was 5,000 US\$ according to IMF figures. Here, Pakistan lies in 123rd place of 185 countries in IMF statistics, behind Moldova and ahead of Nicaragua.

GDP Growth Rate in Pakistan averaged 4.91 percent from 1952 until 2015, reaching an all time high of 10.22 percent in 1954. Since 2005 the GDP has been growing an average 5 percent a year. According to information from the World Bank, Pakistan had growth rates of 2.7% in 2011, 3.5% in 2012 and 4.4% in 2013. In 2014 this rose to 4.7%, in 2015 to 5.5% and about 5.5% is also expected for 2016. However, in May 2016 the Pakistan newspaper DAWN wrote, that the country missed the goal for the financial 2015/2016 year, because there was a 0.19% negative growth by agriculture as a whole against the target of 3.9%. In contrast the performance of the industrial sector was higher than the targeted growth.

publication by the Worldbank from April 2016 says: "Releasing its twice-a-year Pakistan Development Update, the World Bank applauds the government for restoring economic stability but noted that much of the country's economic growth was underpinned by external influences such as low oil prices and strong remittances while private and public investments continue to remain low.

The report highlights that the pace of Pakistan's economic growth will accelerate modestly through to 2019. However, significant risks remain and the country should guard against global slowdown by continuing to make key reforms, including expanding the electricity supply, boosting tax revenues, strengthening the business environment and encouraging private sector to invest. "

According to World Trade Organization data, Pakistan was on the 69th place on the list of exporting countries for merchandise in the world in 2014 with a share in world total exports of 0.13 percent. The WTO reports that in 2014 Pakistan exported goods worth a total of 24,714 million US\$ (-2%), compared with imports worth 47,636 million US\$ (+7%), thus generating a trade deficit of 22,922 million US\$. Pakistan's most important trading partner is the EU(28) which accounts for 29.2% of exports and 9.3% of imports, followed by the USA with 14.7% of exports. Other important export markets for Pakistan products are China (9.1%), Afghanistan (7.6 %) and the United Arab Emirates (5.4 %). Other major suppliers of imports to Pakistan are China (20.2%), United Arab Emirates (14.9 %) and Saudi Arabia (9.3%).

And this brings us to the textile industry. According to the WTO statistics textile exports of Pakistan were valued at 8705 million US\$ in 2012, 9341million US\$ in 2013 (+7.3%) and 9077 million US\$ in 2014 (-2.9%). Clothing exports were worth 4214 million US\$ in 2012, 4549 million US\$ (+8.0%) in 2013 and 4991 million US\$ (+9.7%) in 2014. Between 2010 and 2014 clothing exports added 27% which is a considerable jump. Both sectors together contribute to more than 76% of Palistan' s total manufacturing exports, 57% of total exports and also 5.2% of the Gross National Product of the country. Pakistan's textile exports makes up 2.9% of the world textile exports. Clothing exports makes up 1.0% (4991/ 483280 million US\$).

In the 1950s, textile manufacturing emerged as a central part of Pakistan's industrialization. In 1950 Pakistan Industrial Development Corporation (PIDC) was originally established as a Central Corporation under the PIDC Act. The primary aim of establishment of PIDC was to set up industries in such fields where the private sector was shy and where large amount of capital outlay with long gestation period was required. The modern development of the textile manufacturing started in 1953 with the inauguration of the Valika Textile Mills at Karachi – the first in Pakistan. In the 1960s and 70s the sector grew although there were some obstacles like lack of technical staff and shortages of capital.

In 1974, the Pakistan government established the Cotton Export Corporation (CEC). The CEC served as a barrier to private manufacturers from participating in international trade. However, in the late 1980s, the role of the CEC diminished and by 1988-89, private manufacturers were able to buy cotton from ginners and sell in both domestic and foreign markets. Between 1947 and 2000, the number of textile mills in Pakistan increased from 3 to 600. In the same time period, spindles increased from 177,000 to 805 million.

Today most of the Textile Industry of Pakistan is established in the Punjab region, mainly in and Karachi. The United Nations Development Programme (UNDP) estimates that the textile and clothing industry provides employment to 38 percent of the manufacturing labour force.

All Pakistan Textile Mills Association (APTMA) is the premier national trade association of the textile spinning, weaving, and composite mills representing the organized sector in Pakistan. APTMA emerges as the largest association of the country as it represents 396 textile mills out of which 315 are spinning, 44 weaving and 37 composite units.

Like many other textile countries Pakistan has a Ministry of Textile Industry (created 2004). Since 2014 Abbas Khan Afridi is the Federal Minister of Textile Industry in Prime Minister Nawaz Sharif's cabinet. The mission of the Ministry is as follows: "Sustain the growth of textilesector in an increasingly competitive environment while effectively responding to the challenges and opportunities provided by the globalization of trade and providing a forum to the domestic textile industry for a mutually beneficial interface."

In the 'Textiles Policy 2014-19', a perspective plan for five years published in February 2015, the Ministry describes the volume of the textiles industry in Pakistan: "The textiles industry consists of 11.3 million spindles, 0.3 million rotors, 350,000 power looms, 18,000 knitting machines and processing capacity of 5.2 billion sqm. It has the 700,000 industrial and domestic stitching machines. In addition, it has a strong fibre base of 13 million bales of cotton and 600,000 tons of manmade fibres including polyester fibre. There are 21 filament yarn units having capacity of 100,000 tons. The filament and yarn industry is supported by PTA plant which has 500,000 tons capacity. Thus a complete textiles value chain exists in the country which is rare in the world, unlike many competitors which have only primary base or the finished base."

wever, these figures sound very strong since a couple of years the textile industry of Pakistan has mayor problems. Looking at the textile news, it seems to be that one crisis follows another. Biggest problems have been energy shortages, high interest rates, security challenges and high utility prices. Already in 2012 Blomberg noticed that "Pakistan's Textile industry is dangerously fragile". The article reflected the huge energy supply problems of the country. It says that power blackouts last as long as 20 hours at a stretch in Faisalabad. Shortages of natural gas can go on for six days at a time.

In 2013 the EU granted Generalised System of Preferences (GSP) Plus status to Pakistan granting Pakistani products a duty free access to the European market.

In November 2015 the Express Tribune launched an article "Textile industry in its worst patch in history" and wrote: "The gap between Pakistan and its regional competitors has widened so much that now it looks unlikely that the country will ever catch up. The situation started deteriorating a decade ago but the stark disparity in exports became much more visible in the last five years."

In September 2016 Bloomberg reported that according to APTMA more than 500,000 jobs were lost in two years as factories close. And in October 2016 Cotton Crop Assessment Committee (CCAC) revised cotton production estimates downward for the second time in the current season to 11.0 million bales against the initial estimates of 14.1 million bales for the current season (2016-17).

This is a long list of bad news from the textile industry in Pakistan. So now let's have a look what the govenment and the industry is doing to fight back the crisis and improve the situation to make sure that the important textile industry returns to growth.

t the 4th Meeting of the reconstituted Federal Textile Board (FTB) was held in Ministry of Textile Industry on 29th August 2016, under the chairman ship of Federal Minister for Commerce Eng Khurram Dastgir Khan the Pakistan Cotton Ginners Association (PCGA) and Cotton Commissioner informed the gathered stakeholders that through close coordination between Federal Government and Government of Punjab the Pink bollworm which had damaged the cotton crop last year have largely been controlled. Furthermore, a large number of farmers have been trained to drain their fields properly so that their crops can be safeguarded. And the Minister informed that in Prime Minister Nawaz Shareef leadership the PML (N) government had already facilitated the exporters through zero rating, unprecedented cuts in exports financing rates, uninterrupted supply of electricity and gas and repeated reduction in electricity prices and assured the stakeholders of full government support.

The zero-rated sales tax regime (no tax, no refund) for exporters of textiles, leather, surgical instruments, sports goods and carpets, has been proclaimed by Finance Minister Ishaq Dar at the beginning of June to help the industry competitive in the international market. Page 86

Concerning the vitalisation of the cotton harvest Reuters reportet that 'Pakistani scientists at the Central Cotton Research Institute are developing 45 new drought-tolerant and heat-resistant cotton seed varieties with the help of private seed companies'.

So much for the status quo! Now we will have a look at further development. The visions of the Textiles Policy 2014-19 is to become a leading country in the field of export of value-added textile products. The government has defined the goal to double value-addition from \$1billion per million bales to \$2 billion per million bales in five years and to double textiles exports from \$13 billion per annum to \$26 billion per annum in next five years. They want to to facilitate additional investment of \$5 billion in machinery and technology. It is the goal to strengthen existing textile firms and establish new ones. SME sector will be main focus of attention to enhance growth in value-added products through support and incentives schemes.

Our brief analysis has shown that Pakistan has a huge textile industry which is strong enough to resist a lot of problems over a long period. The most important issue for the govenment is to ensure a solid energy supply. And if the govenment will be able to implement their plans the outlook for the textile industry of Pakistan is not bad. One should keep in mind that Pakistan is the 4th largest cotton producer of the world and to be an important cotton country is the best condition to be an important textile country, too. It shall be essential to further modernize the industry in order to provide efficient machines with high productivity and flexibility levels.



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Opening ceremony of ITA Augsburg

Under the guideline principle "Textile (research) is coming back to Augsburg", the Institut für Textiltechnik Augsburg (ITA Augsburg) was cordially opened on 23 September 2016 at a ceremony in presence of professional public. The location of Augsburg provides long textile tradition and possesses now the first textile research institute in Bavaria, Germany, at the heart of top cluster MAI Carbon. The institute belongs to the ITA Group around the Institut für Textiltechnik of RWTH Aachen University (ITA). ITA Augsburg stands for key topics in research, development and industrialisation of composites. Textile components become more and more important in the design of composites. They are represented through the research topics recycling of (carbon) composites, fleece technology and the application of thermoplastic composites, especially in hybrid component structures.

RWTH Aachen University is the largest technical university in Europe with regard to third-party funds. It invests know how and equipment targeted in the research region Augsburg and completes its growing expertise in lightweight construction and composite technology at this location.



Opening ceremony with Prof. Dr. Sabine Doering-Manteuffel, President University of Augsburg, Prof Schlichter, Prof Gries and Mayor of Augsburg Kurt Gribl

With ITA Augsburg the research location Augsburg gains additional and necessary expertise to the previous range of services which are essential elements for the development of modern lightweight materials using fibre composite components. Within ITA Augsburg, all important process steps for the research of composite parts are onsite available.

News from Textile Research Centers

Prof Dr Thomas Gries, Director of Institut für Textiltechnik of RWTH Aachen University, was delighted how positive ITA Augsburg developed since its establishment. In particular he was pleased about the practiced synergy in research with the Institute of Materials



Prof Schlichter talked about the future of the the Golden Fleece is black

Ressource Management (MRM) of the University of Augsburg, the German Aerospace Center DLR-ZLP, both the working groups of Fraunhofer FHG-IGCV on one side and the Institut für Textiltechnik (ITA) of RWTH Aachen University which has been established in the composite technology for decades. This cooperation represents to him a future model for mutually beneficial research collaborations.

During the opening ceremony, Prof Dr Stefan Schlichter, Director of the institute, introduced new research approaches about the importance of nonwoven technology for composites for the design of compound materials. Nonwovens are nowadays successfully and with a growing proportion used in technical applications in the automotive and aerospace industry. It enables under the aspects of recycling and sustainability a new design even in light weight and composites. Afterwards industry representatives including Mr. Dilo, Managing Director and owner DILO Machines, and Dr. Stini, Managing Director TENOWO, discussed the future potentials of this new technology. Prof Stefan Schlichter reported proudly that within a short time latest and worldwide unique research facilities were put into operation with the help of industry and of RTWH Aachen University.





Discussions about future potentials of nonwoven technology for composites

The nonwoven compact line from Dilo

Even this support by industry, of research funds of ITA and by RWTH Aachen University accumulating to more than 3.5 million EUR show the deep trust in the expertise and the potential of the new institute. "This will encourage us for the future excellence in research in composites and textile technologies", underlined Prof Schlichter. The visitors used the opportunity to inspect the latest and worldwide unique nonwoven fabric production for the processing of recycled composite fibres at the SIGMA Technopark, Augsburg, Germany. The complete nonwoven line provided by the company DILO will be used for the development of suitable treatment and production processes of fabrication, semi-finished materials and product waste made out rCF, glass und aramides. Appropriate applications made out of recycled composite materials will be developed on it - a contribution to solve the sustainability concerns of the new material carbon. Within the Technologiezentrum Augsburg (TZA), a new organo melt injection moulding press for the economical production of thermoplastic composite components was presented. This injection moulding press allows to produce ready-made components in their final shape.

www.ita-augsburg.com (German only)

Ceremonial inauguration of ITA Istanbul

The long-time tradition of German-Turkish cooperation is being strengthened and expanded further. The İTA İstanbul Tekstil Araştırma Geliştirme ve Eğitim A.Ş. (ITA Istanbul) was officially inaugurated on 08.10.2016. The ITA Istanbul is an institute in cooperation with Turkish textile export associations from the regions of Istanbul, Gaziantep, Bursa, Adana and Izmir and Institut für Textiltechnik der RWTH Aachen University (ITA) and ITA Technologietransfer GmbH, Aachen. The aim is to strengthen German-Turkish economic and scientific relations.

In addition to Dr. Faruk Özlü, the Minister of Science, Industry and Technology of the Republic of Turkey; the mayor of the city of Istanbul Kücükcekmece, Mr. Temel Karadeniz; the Chairman of the Turkish Exporters Assembly (TIM) Mr. Mehmet Büyü-kekşi; The chairman of the largest Turkish textile export association called Istanbul Textile and Raw Materials Exporters Association, Mr. Ismail Gülle, and members of other partner organizations, a large number of high-ranking participants from politics, science and business were represented.

The ceremonial inauguration was carried out with incentive speeches on the subjects such as business model innovation and industry 4.0 as well as speeches on innovations in textile technology. One highlight was the possibility to visit all facilities and equipment of ITA Istanbul in operation.



Cutting the inauguration ribbon

Minister Dr. Faruk Özlü took time to visit the institute. The ITA and transfer company ITA GmbH have been providing intensive connections with companies, universities and industrial associations of the textile industry in Turkey for over seven years. The aim is to strengthen the partners in Turkey and Germany through joint development projects, exchange of know-how and promotion of commercial and academic training on both sides.

News from Textile Research Centers

Through the location in Istanbul, partners and industrial customers in Turkey will be acquired, managed and integrated into joint development projects. In addition, German and Turkish companies will be supported on development of markets in the respective other country. Transnational cooperation will be maintained and developed further, in particular through intensive partnerships with industrial associations, universities and research institutes in Turkey.

The directorate of ITA Istanbul is set significantly by the ITA of RWTH Aachen University. The central technological fields of nonwovens, clothing, finishing, coating and the environment are focused under the management of Dr.-Ing. Bayram Aslan. Another business area is consulting and testing services. The ITA-Istanbul has as a partner university, the Marmara University, and is located 30 minutes from Istanbul Ataturk Airport in a still developing technology park of Marmara University. A lecture on "Technical Textiles" will start at the Marmara University this year. The lecture will be given by Dr.- Ing. Bayram Aslan.

www.ita.rwth-aachen.de

High-performance filters with nano fibers: Start of a new project in Heinsberg and Aachen

Thomas Rachel, Parliamentary State Secretary at the Federal Ministry of Education and Research (BMBF), on September 14th, 2016 gave the starting signal for an innovative project dealing with the development of new, efficient filters for gas, water and oil purification. The project team covers the whole production chain of such innovative filters. Votech Filter GmbH (Heinsberg) and DWI are the initiators of this joint project, which has a total funding volume of 2.2 Million Euros.

www.dwi.rwth-aachen.de

A hydrophobic membrane with nanopores for highly efficient energy storage

Storing fluctuating and delivering stable electric power supply are central issues when using energy from solar plants or wind power stations. Here, efficient and flexible energy storage systems need to accommodate for fluctuations in energy gain. Scientists from the Leibniz Institute for Interactive Materials (DWI), RWTH Aachen University and Hanyang University in Seoul now significantly improved a key component for the development of new energy storage systems.

www.dwi.rwth-aachen.de

PhD students outline future challenges in polymer sciences

Young chemistry talents were in the spotlight of the second Leibniz Young Polymer Scientist Forum, which took place at DWI – Leibniz Institute for Interactive Materials on July 6 and 7. Evonik Industries and DWI had invited 19 PhD students from research institutes all over Germany. For two days, they discussed current trends and future developments in polymer sciences and developed new research approaches.

The participants had a background in intelligent materials design, composites, polymers for medical or energy applications. The presentation of new project ideas and the awarding of the best idea were the highlights on the second day of the event.

www.dwi.rwth-aachen.de

16. Aachener Membrane Colloquium 2016

The biennial 'Aachener Membran Kolloquium' (AMK), organized by the Chair of Chemical Process Engineering at RWTH Aachen University, is one of the leading international conferences on industrial applications of membrane technology. The 16th conference will take place from 2.-3. November 2016 in Aachen. conferences.avt.rwth-aachen.de/AMK/

With the "third dimension" of drinking water in dry areas bring fog catchers "Cloud Fisher" on the market

ITV Denkendorf brings drinking water in dry areas

To supply all people with drinking water is one of the great challenges of the future. Particularly in developing countries, a central water supply is often technically and logistically impossible. The Denkendorf Institute of Textile Technology and Process Engineering (ITV) has developed a high-performance textile which wins the water from the air. It is now in the form of a 'fog catcher "on the market. What nature in dry areas for millennia successfully employed to survive, research is now trying to put into technology: Recovery of vital water from the humidity of the air.

Models are the desert beetles, the Canarian pine and desert grasses. The three-dimensional structures of the fog-catching plants and animals may be particularly well modeled with spacer fabrics whose structure with parameters such as fiber diameter, comb size and mesh density can be influenced. Like their biological models they offer a large contact area for fog. Thanks to their high air permeability they are able to resist storms with winds of up to 120 km / h. And also extremely high solar irradiation cannot harm this spacer fabrics.

News from Textile Research Centers

The 3D textile fabric "FogHa-TiN" was integrated in the mist collector "Cloud Fisher" and in a test was able to generate 66 liters of water / m^2 fabric per day. Thus, the textile is about three times effective than conventional material.



Fog catcher "Cloud Fisher"

10th Aachen-Dresden-Denkendorf International Textile Conference: industry visions, trends, and innovations

The organizers of the Aachen-Dresden-Denkendorf International Textile Conference invite to Dresden for the 10th ITC, which will be held on November 24th to 25th, 2016. The confernce will present a sophisticated program in three parallel sections with renowned national and international speakers. Top-class experts from industry and research will share their perspectives, give new insights for products and innovations, and broaden everybodys perspective. With this year's partner countries Austria and Switzerland, the ITC once more offers a platform to explore opportunities for research co-operations and networks outside of Germany.

Circa 80 presentations and many posters will showcase national and international scientific achievements and results from the fields of fiber-reinforced composites, functional textiles, megatrends, polymer materials, as well as functionalization for textile structures in fiber-reinforced composite materials, protective textiles, and megatrends. The transfer session "From Idea to Practice" will present technological and product developments that have successfully been adapted by the industry.

The topics in three parallel sections are fiber-reinforced composite materials, polymer materials and functionalization of textile structures for fibercomposite materials, safety textiles and megatrends, protective and functional textiles, megatrends and a transfer session "From Idea to Practice".

Plenary lectures will be given by Prof. Dr. Hubert Jäger from Carbon Composites e.V. talking about 'Lightweight material future is hybride ... are carbon composites out now?', Prof. Dr. Sebastian Koltzenburg from BASF talking about 'Surface modification via functional systems', Christian Leu from Ernst & Young referring to the topic 'Times of change - How traditional industries must transform themselves to stay ahead of the competition' and Prof. Dr. Werner Sobek speaking about 'Textile architecture'.

www.aachen-dresden-denkendorf.de

Interview with: Prof. Thomas Gries InstituteDirector ITA Prof. Stefan Schlichter ManagingDirector ITA Augsburg

"The focal point of our work in Augsburg is "web-based composites"." On Friday, September 23, you inaugurated the new ITA Augsburg. All guest speakers emphasized their faith in you and the new ITA Augsburg, as well as their high expectations. You now have access to a brand new technology center including excellent equipment such as the non-woven line by Dilo and an injection moulding press. It is evident that excellence is also a requirement in your research. What exactly are your plans and how are you approaching them?

Prof. Schlichter: We are indeed able to present top-of-the-line equipment, which reflects the industry's great faith in our future performance. Excellence truly is the guiding principle of our research, which will determine our day-to-day actions. We want to contribute to creating a space for new textile technologies, processes, and products to be used in lightweight construction.

Economic efficiency and the product-oriented increase of properties play the most important role in this endeavor. The focal point of our work is "web-based composites", a new category of textile composite components whose potentials and uses we seek to examine. The challenge is to create avenues for practical application and to deliver fast results to the industry, whilst maintaining systematic scientific work processes. For the research cluster on carbon, the new ITA Augsburg is cooperating with the Institute for Materials Resource Management (MRM) of Augsburg University, the Institut für Luft-und Raumfahrt DLR-ZLP (German Aerospace Center), both working groups of Fraunhofer Institute FHG-IGCV, as well as of course, the ITA at RWTH Aachen University. Don't too many cooks spoil the broth? What makes cooperative research a future-ready approach?

Prof. Gries: You'd be right if we were making broth. But we are making a 4-course meal! Regardless, each cook has to know what he or she is capable of and what customers want. The competencies of the 4 cooks were harmonized in advance and are applied in our daily work and strategic planning. The scientific advisory board is staffed with members from across the various units to ensure well-harmonized strategic planning. Spatial proximity is an advantage in our day-to-day business. UNA operates the material scientific foundations and the crucial interface between composite and matrix. We work with composite and textile technology, DLR is responsible for component design and manufacturing for aerospace applications, and Fraunhofer works in the production of components and the examination of any products not related to aerospace technology.

By the way, there is a simple saying with respect to these textile applications: Composite fiber bundles requires research cooperation bundles. For years, Augsburg has been boasting an established competency in lightweight construction and composite material technologies; ITA Augsburg is now Bavaria's first textile research center. How will the cluster as a whole benefit from ITA Augsburg and which kind of company should be particularly interested in your research? Who should care about ITA Augsburg?

Prof. Schlichter: Of course, any company investing in lightweight construction and its further development, as well as customized applications could and should be interested. The significance of textiles in the area of composites will be on the rise and become the interface between matrix and textile with the goal of boosting properties and their economic efficiency. Our contribution to the research network in Augsburg is enhancing this potential and to present the opportunities and possibilities of textile technologies.

You have been shaping textile technology research in Germany at the helm of ITA for more than 15 years. You closely collaborate with industry partners and are responsible for Germany's leading position in technical textiles and other textile innovations. Now, ITA is expanding – not only in Germany. ITA Augsburg. ITA Bursa in Turkey. Maybe ITA Shanghai some time soon? Your research is becoming more comprehensive and international. Why is this the case? Is this driven by a fundamentally new vision? **Prof. Gries:** Yes. The textile industry has always been a pioneer in technological and economic development. This is something we must pursue by driving future trends. The industry is internationally connected; many of our customers are global players. For this reason, we have to operate at an international level when it comes to innovation services and prepare our students during their studies and as researchers.

We approached Shanghai or rather, China, but despite the desired transformation, China does not yet seem ready to understand textile research the way we want to pursue it. However, this will certainly happen with the turn to value-added products over the next decade. Other than that, several new ITA research centers will be opening soon: India including a branch in Mumbai, Korea in November, and Maastricht is coming up in December. In addition, we have established contacts with local partners for almost all textile countries including Belgium, France, Italy, Eastern Europe, Russia, as well as Japan and North America.

After closing the process chain from raw material to textile end-uses at ITA, research is now focusing on special applications for satellites, preferably in an interdisciplinary manner across clusters. A number of international foundations and corporations also pursue the desire of providing opportunities to people with bicultural roots, who are passionate about textiles and want to drive their countries ahead. ITA likes to create the framework for this work, because we keep on investing in people and ideas. Your research is focused on textile components in the development of composites. Focal points include the recycling of (carbon) composites, nonwoven technology, and the application of thermoplastic composites, particularly in hybrid components in the field of mobility. Which potential uses do you see for the future?

Prof. Schlichter: Central topics for the future use of composites include the improvement of economic efficiency, new areas of application, as well as resource efficiency in the process chain. A significant area of application for "Web-Based Composites" is the conversion of composite waste in customized products. Wherever there is a requirement of weight reduction at medium stress requirements – there are numerous examples for this – these products will present an alternative in the future.

We believe that thermoplastic composites will become more important not only with respect to recycling. Improved recycling solutions go hand in hand with new product design and improved economic efficiency. Particularly for hybrid structures, significant process variations emerge from the combination of Organomelt and injection molding. Every year, 12-15,000 t carbon composites become industrial waste. At $20 \notin kg$, this results in a raw material value of up to $\notin 300$ m annually, which is ever increasing. Does the pressure to succeed weigh on ITA Augsburg despite the potential?

Prof. Gries: Yes, we can definitely feel the pressure. It motivates us to perform even better. Nothing is more motivating than the development of new technologies that are desperately needed.

On the one hand, we approach the task by using an explorative, which means handling components at an experimental level that may be market ready as early as next year. This also includes creating samples to make technology tangible. The samples enable more people to become involved, which in turn, will allow for the emergence of more ideas. This is necessary and promises success, since the traditional carbon world mostly focuses on filaments.

On the other hand, however, it is necessary to understand the new material extremely well, in order to develop components, and to know the load capacity and other properties. This requires strategic, interdisciplinary research for five years or more.

Why is it an advantage that you as a researcher also have extensive experience with the nonwovens industry?

Prof. Schlichter: Assessing the needs of the industry quickly and correctly and to translate it into new solutions is important for applicability, which becoming more and more of a requirement in research. Of course it helps if you know these requirements because of longstanding experience in the industry and to have fostered relationships with companies and individuals with whom to discuss these requirements critically at any time. Trust developed over time plays an important role.

What are your hopes for Prof. Schlichter and ITA Augsburg?

Prof. Gries: Stefan, you sold me on textile technology during my studies in engineering and achieved a lot in your professional life thanks to your wide-reaching technological foundation, customer-orientation, and networks. Stay the way you are! Keep on winning people over, exciting them, and developing them. Make the issue of "web based composites" an internationally renowned focal point for economically efficient solutions!



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