

fibers and filaments

the experts' magazine

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Upgrading for market success

Greater performance through targeted upgrades

Following several boom years, the global fiber and yarn market has come to a phase of normalization. For market observers, this is a completely natural development.



Retrofit

Replacing winders gives market players the edge

While the development of machines and systems, spinning processes and further processing is constantly progressing it is essential that manufacturers keep up to speed.



"I have dedicated my daily work to ensuring my customers are successful. Because the success of my customers is also my success. After all, we are partners!"



Zhang Jian
Aftersales Service Engineer

Partnering for Performance

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In focus



Turning old into new
Interview with Marcel Bornheim,
Head of Customer Service,
Oerlikon Manmade Fibers

4



Upgrading for market success
Greater performance through targeted upgrades

6



Retrofit – replacing winders gives market players the edge
New take-up units make manufacturers competitive

8

Innovation and technology



EvoTape
The (r)evolution of tape production

10



WINGS POY 1800 successfully launched
Efficient concepts for the most versatile textile fabrics

14

PP spinning with VarioFil 15
Plant Operation Center 16

In brief
News and reviews 18

In time
Upcoming events 21

On the markets
PCI Fiber Red Book 22

People
Hidden Champions: The modification team 26

Service
Customer proximity showcased 28

Panorama
'Zero harm to people' 30

Imprint 32

Editorial



Dear Customers, dear Readers,

The past few years have been characterized by considerable investment in major systems and equipment, with immense capacities being created across the globe. And we think that the time has now come to take a look at the details. There still remains plenty of scope for optimization. The potential for even better systems performance and even more profitable processes is far from being fully exploited. In a period in which the market is settling down, it is the small things that market players have to adjust. It is the details that make a difference and ultimately bring about great things.

For market participants whose products stand out with unique selling points, the intense competition is also a major opportunity to increase their market shares. Move away from the beaten track and let your ideas take concrete shape. And let us help you achieve your ambitions. In the current edition of Fibers & Filaments, read about how Oerlikon Manmade Fibers can assist you in becoming a major player with our customized After Sales Services. Convince yourself of the sophisticated solutions such as our Plant Operation Center, which is tailor-made to your specifications. Be inspired by innovative technologies for manufacturing specialty yarns, high-end materials and new applications.

We are thrilled to be able to present you with yet another magazine with a whole array of exciting topics.

We hope you enjoy reading this edition of Fibers & Filaments.

With best regards,

Stefan Kroß, CEO of Oerlikon Manmade Fibers



Turning old into new

Modernization is worthwhile

Oerlikon Manmade Fibers machines and systems carry out their work for decades, something that is hugely beneficial to manufacturers. Nevertheless, progress is steaming ahead within the textile machine construction sector, with production processes becoming increasingly efficient and complex.

But what do you do when your own system becomes older, production is no longer as efficient as it could be and the market is demanding new products? Fibers and Filaments spoke with Marcel Bornheim, Head of Customer Service, about the possibilities with which Oerlikon Manmade Fibers supports its customers in such cases.

Mr Bornheim, what exactly can the OMF Service division do to support customers with their aging systems?

In an age of growing competition, our most important objective must be to retain – or increase – the performance and profitability of the systems. This is the only way we can ensure that investments do not lose their value and that increasing margins can be achieved.

How do you set about achieving that?

In numerous targeted interviews with many of our customers, we very clearly heard their desire for a closer service partnership. This means that we also develop – in close collaboration with the yarn manufacturer – solutions for modernizing older systems, to ensure that the life expectancy of producers' machines is systematically extended, hence exploiting their investments to the greatest possible extent. This is no longer merely about function-retaining repairs and maintenance work, but about providing customers with a long-term competitive edge by means of leading machine technology.

And what form does this take on concretely?

In principle, we have identified several focus topics with regards to customer requests for modernizations. One of them relates to electrical components; in part, these are so

old that it is virtually impossible to procure spare parts and controlling and steering the systems is anything but ideal. However, this is one of the fundamental prerequisites for efficient production. Here, we can help by developing new products that permit the replacement of larger modules without the system's concept generally having to be adapted. To this end, we upgrade the electrical engineering to ensure that it complies with current standards and requirements.

Furthermore, our customers are increasingly inquiring about energy-saving components. In an age of high energy prices, the energy consumption of individual machine parts is frequently a decisive criterion for profitable yarn production. And the topic of sustainability is also becoming increasingly important; a development that Oerlikon Manmade Fibers has been addressing with energy-saving concepts based on its tried and tested e-save solutions for many years now. With our help, customers can also operate old systems in an energy-efficient manner, enabling them to save money in the process.

Here, the components especially developed for replacing the take-up unit have also been designed with energy efficiency in mind. The new winder technology makes a substantial contribution towards lowering energy costs. The automatic high-speed winders, either with camshaft, grooved roller or bi-rotor, in turn ensure low waste rates both in yarn production and in further processing, hence also helping to save money.

In addition to this, we have registered increased demand for performance checks for old systems. Here, the customer is assisted in optimizing its processes and procedures, managing the system in the best possible way – in other words, striving towards operational excellence. This is how the customer is empowered to better exploit market opportunities and increase its margins, even with machines of older vintages.

How do you implement these tasks?

In the world's most important markets, Oerlikon Manmade Fibers has employee teams made up of highly-qualified experts, advising and helping customers in optimizing both their systems and the systems management. What is important to us is to implement the benefits of a close and trust-based service partnership directly for our customers, hence securing long-term competitiveness for them.

Thank you for speaking to us, Mr Bornheim. (wa)



Upgrading for market success

Following several boom years, the global fiber and yarn market has come to a phase of normalization. For market observers, this is a completely natural development.

It is particularly during this consolidation phase that yarn manufacturers are able to strengthen their competitiveness by focusing even more on unique selling points such as specialty yarns and yarn quality. In this situation, Oerlikon Manmade Fibers is a recommended consultant, opening up technical possibilities for customers to maintain a competitive edge even without having to make larger financial investments.

Greater performance through targeted upgrades

Those, for example, considering innovative specialties as a profitable business model in difficult market conditions must ensure that they

have the corresponding state-of-the-art manufacturing methods at their disposal. This also applies to companies that are reserved when it comes to current or traditional investments; because they have to carry out new certification audits to become supply partners when switching systems, for instance.

Here, modernizations, upgrades and retrofit solutions (see article on page 8) are a comparatively low-cost, yet targeted, alternative. They not only replace old technology with new, they also increase productivity and margins, make



their offerings more flexible and lower costs for production, energy and maintenance. And finally once again become future-proof, corresponding to the latest legal environmental and sustainability standards in the process. "We are currently expanding our technical and consulting offerings in this direction, particularly also with the objective of catering to the requirements resulting from the still-ongoing difficult market situation", states Marcel Bornheim, Head of Customer Service at Oerlikon Manmade Fibers (see also interview, page 4).

"We are currently expanding our technical and consulting offerings in this direction, particularly also with the objective of catering to the requirements resulting from the still-ongoing challenging market situation."

Taking a step backwards to move forwards

This applies, for example, to older machines and systems, for which certain parts are no longer available. "In such cases, we can – on request – supply solutions and support designed to economically maintain production processes. Here, we sometimes adapt current technology in a way that enables it to be backward compatible", explains Marcel Bornheim. To this end, we showcased both longer, and shorter, WINGS POY again at the ITMA 2014 trade fair in Shanghai, for instance. These fit into older buildings and system concepts, but are equipped with the very latest winding technology. With this, customers once again gain access to the latest technology and spare parts and acquire cost-reduced processes – without have to change given buildings or systems structures. The potential benefits

include no extensive investment or new audits; instead, they have the advantage of supply security and frequently also energy savings – and, last but not least, the possibility of securing higher margins.

A further solution option is targeted at the intensely-competitive commodities market: if the markets and fashion trends change, there is often the demand to manufacture colored yarns of a certain quality. "With our engineering know-how, we offer the opportunity for

converting certain system parts from commodities to specialties manufacturing, hence catering to such trends. For this, we have established a permanent team with consulting and testing competence for customized solutions, because it is essential that each system is individually assessed for potential conversions.

Such solutions allow customers to exploit opportunities that a settling market in the future would also offer. "The world's population, and also affluence, continue to grow, increasing demand for textiles further. To this end, we also see a long-term balancing of market forces with consistent, albeit reduced, market growth over the next few years", sums up Rainer Schneider, Senior Expert Market Research at Oerlikon Manmade Fibers. (tho)

Consulting for modernization

Check here:



for more information on Oerlikon Manmade Fibers modernization, upgrading and retrofit solutions, or contact

service.manmade-fibers@oerlikon.com



Retrofit

Replacing winders gives market players the edge

Filament spinning systems manufactured by Oerlikon Barmag operate for decades. Fundamentally, this is positive. However, the development of machines and systems, spinning processes and further processing is constantly progressing. And it is essential that manufacturers keep up to speed here.



Systems operators frequently have difficulty in justifying major investments – particularly in times in which markets are stagnating or even declining. However, failing to make investments can conversely also quickly result in manufacturers being overtaken by their competitors. Today, upgrading and modernizing the take-up offer an excellent solution at manageable costs.

New take-up units make manufacturers competitive

The benefits of retrofitting an older system with automatic high-speed winders are plain to see: lower waste ratios during production and further processing reduce costs, while new winders simultaneously promise higher returns. “Package prices are decisively determined by the package build. The new precision winders offer a whole new dimension to manufacturers”, comments Manuela Friedrich, Regional Sales Director at Oerlikon Barmag in Chemnitz. “Furthermore, the superlative quality of the packages provides yarn producers with access to other markets.”

In addition to this, the new winder technology also offers energy benefits. And pragmatic reasons speak in favor of upgrading take-up units as well: spare parts provision becomes easier. In part, the tools used for the old devices can continue to be used for the new equipment.

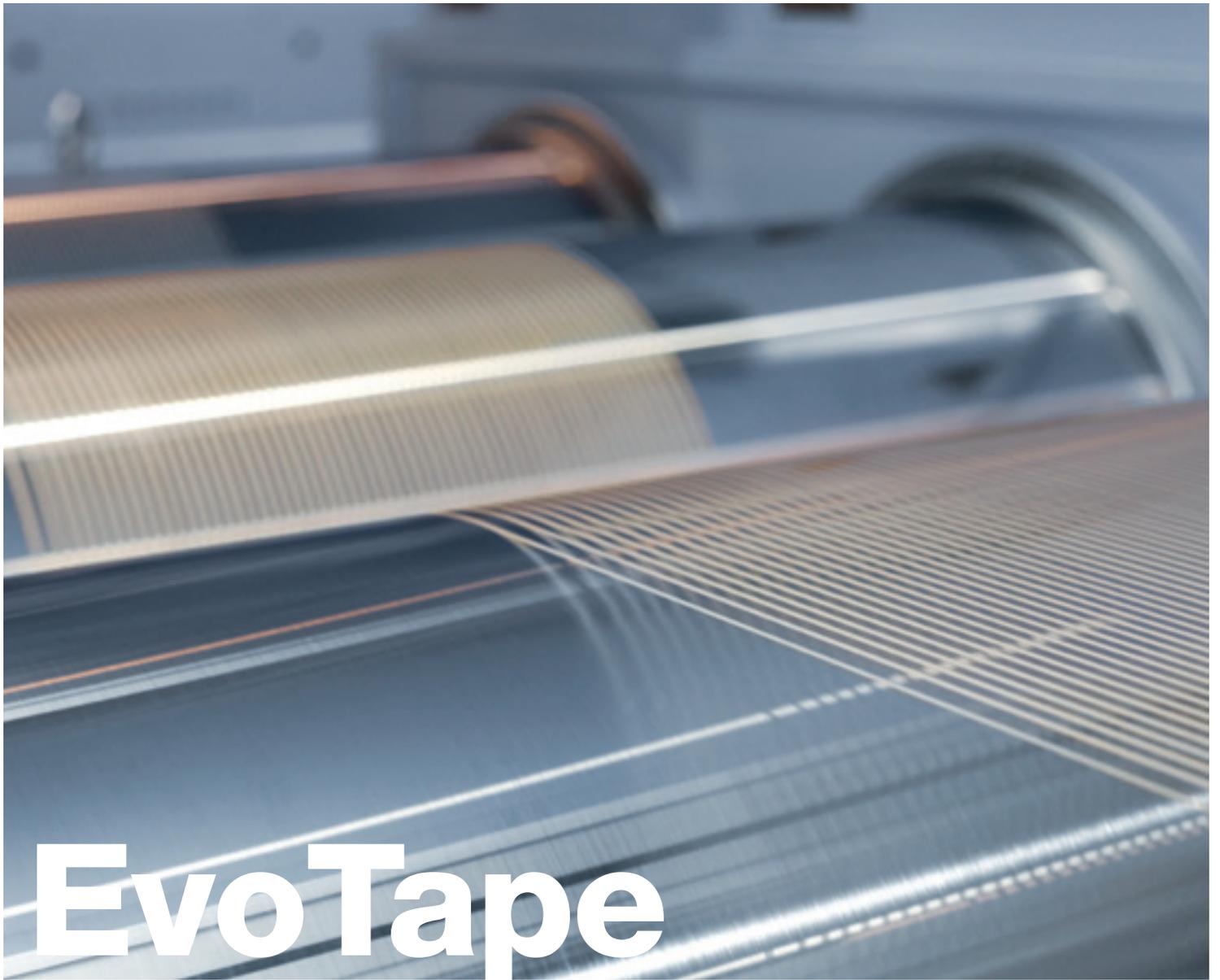
Customized retrofit solutions

There are diverse options for retrofitting a take-up unit. Yarn manufacturers wanting to modernize their equipment can choose between automatic high-speed winders with cam shafts, grooved rollers or bi-rotor traverse systems. Producers can select from the ASW, the babyASW, the WinTens and the ACW winder designs for all filament yarn processes as well as a WINGS POY system especially adapted for system upgrades, ensuring that there is a suitable take-up system for virtually all older equipment. (bey)



The Oerlikon Barmag ASW winder is one of the preferred winders when it comes to retrofitting spinning lines.





EvoTape

The (r)evolution of tape production

The technology used for manufacturing tapes has remained the same for many years now. Although minor optimizations have been achieved with regards to the production speed, there have been no quantum leaps in the technology. For this reason, there has been very little replacement investment over the years.

However, the broad range of applications for tape yarns ensures constant growth, hence making new investments due to expanding capacities the norm. The application possibilities for extruded tapes range from carpet backing fabrics, textile packaging via agricultural textiles all the way through to the increasingly coveted area of geotextiles.

In addition to systems and yarn quality, the operational expenditures (OPEX) are a very considerable decision-making criterion for investors in view of ever-growing pressure on margins. Traditionally, Oerlikon Barmag extrusion systems are high-end with regards to the quality of the systems, the process and the yarn. To this end, the focus during the development of a new systems concept for tapes was on production costs and energy consumption.

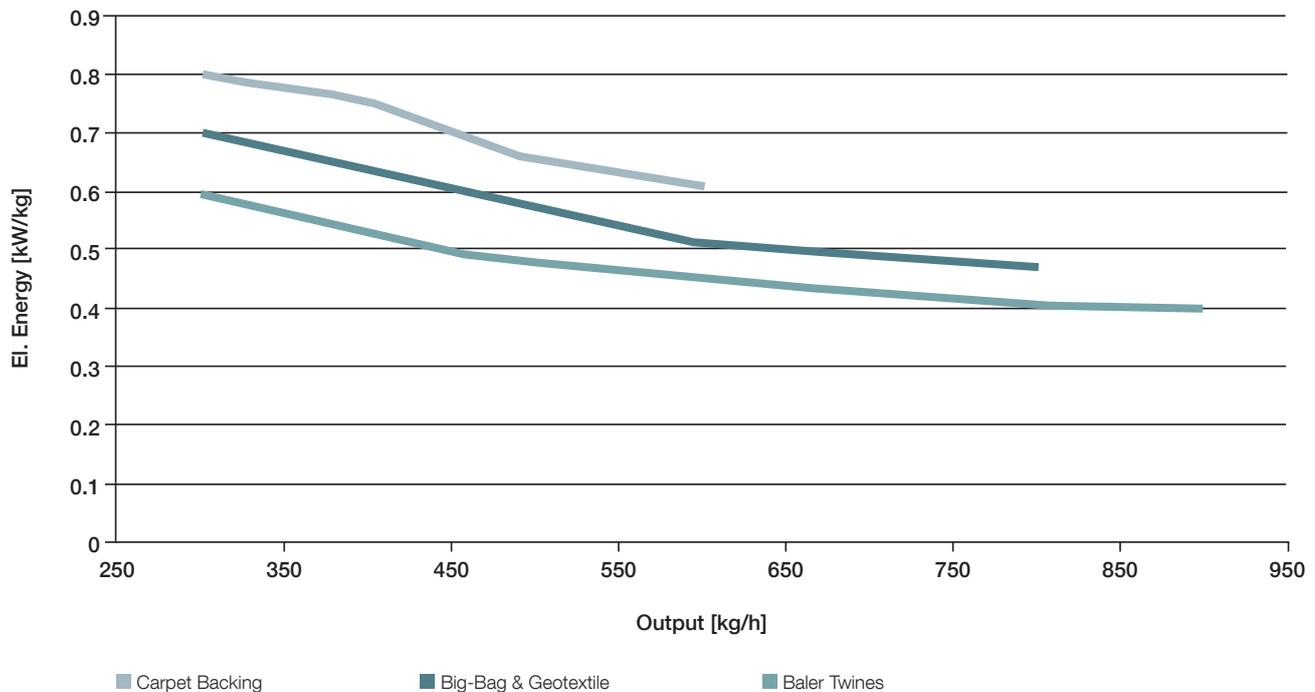
Efficient tape extrusion with the EvoTape concept
With the EvoTape, a process for manufacturing tapes has

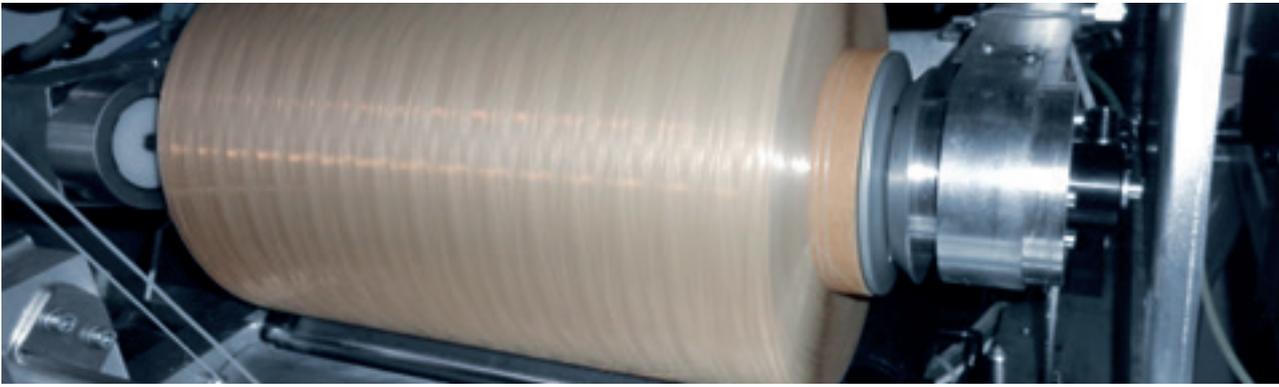
been developed that has literally revolutionized the process used to date: depending on the configuration, the systems output can be increased by up to threefold.

The EvoTape operates with a cold pre-drawing process. In the subsequent, second drawing stage, the tapes are 'lighter'; they take on the heat from the hot-air oven more easily. These two drawing stages result in superior process stability, reaching the same tenacity values with higher speeds or superior properties at the same speed.

The splitting of the drawing process also ensures a low overall draw ratio. As the cut width of the overall drawing is defined, this is also reduced. Consequently, more tapes can be manufactured, which – in addition to the higher process speed – increase the system's output. Overall, the specific energy consumption per kg of output is therefore considerably reduced.

FB9 – EvoTape: Energy consumption in relation to output





Electronic crossing angles ensure perfect package build with optimum quality for the downstream processing.

Cost advantages as a result of greater process stability

A further argument for the new EvoTape concept is its superior process stability: the changed process reduces tape breakages compared to conventional processes. Furthermore, the lower temperature transfer – for example during hot-air drawing – simplifies additional string-up of torn tapes.

WinTape – more output, less waste

Higher speeds reduce the package running time. This, in turn, requires an automatic winder. The automatic WinTape precision winder supplements the EvoTape concept in the take-up stage. Electronic crossing angle(s) ensure(s) perfect package build with optimum quality for the downstream processing.

As the tapes dwell in the yarn guide during package transfer, automatic take-up of folded tapes is possible.

Further plus point: with two parking positions for full packages, the system configuration for carpet backing fabrics can operate for 24 hours without package transfer, hence simplifying shift work.

Furthermore, identical package running lengths, which are common in an automatic take-up concept, reduce waste. Operating the WinTape in conjunction with the EvoTape systems opens up further benefits offered by the new precision winder: production waste occurring during package transfer can be directly routed back to the extruder.

EvoTape concept is available for many processes

Following the successful market launch for manufacturing tapes for carpet backing fabrics, the EvoTape process is now also revealing its strengths for other products. The focus of the development work over the past few months has been on the verification of speed potentials and a lower overall draw ratio for further products: to this end, the new concept currently offers solutions for the manufacture of carpet backing, agricultural textiles and geotextiles.

Carpet backing

The system configuration for carpet backing generates the familiarly high and, above all, homogeneous tape quality at simultaneously considerably higher process speeds. The EvoTape offers a process speed of 400m/min: by contrast, extrusion systems for carpet backing used to date operate at a speed of 320m/min, while systems manufactured before 2010 produce at just 180-280m/min. To this end, the considerably superior productivity of the new EvoTape system in conjunction with the WinTape take-up unit provides yarn producers with a significant expansion in capacity without substantial additional space requirements.

In this application configuration, the energy savings amount to up to 50 % compared to equipment manufactured during the 1980s and 1990s, which is quite permissible for a system lifespan of 30 years and more.



EvoTape for carpet backing offers a process speed of up to 400 m/min.

Baler twine

The potential is particularly apparent in the case of baler twine: here, it is – in addition to higher process speeds – above all the reduction of the overall draw ratio that is significant. With this, it is possible to virtually double the output compared to established processes.

While the titers of carpet backing fabrics lie between 300 and 1500 dtex, the titers for baler twines are 20,000 dtex and higher. Instead of tape widths of between 0.9 and 2.5 mm and thickness ranging from 35 to 45 µm, tapes with widths of between 20 and 90 mm and thicknesses of between 75 and 100 µm can be manufactured. The tapes are profiled or fibrillated and are twisted in the downstream process and wound onto tubeless packages.

The focus of the process is on high tenacities for the yarn and high tenacities for the knots when tying off the bales. To achieve the high tenacities desired, the tapes are drawn at a ratio of 1:12 in currently common standard processes. The high draw ratios mean that in the case of products with 70,000 dtex, for instance, only 3 to 4 tapes can be run in parallel on the system.

With the EvoTape, these draw ratios can be reduced to just the one seventh or one eighth. Lower draw ratios simultaneously also mean cutting narrower tapes, hence allowing more tapes to fit on the godets. The output of the system is virtually doubled in conjunction with the speed increase from 250 to 350 m/min: from 500 kg/h (common market standard) to up to 1,000 kg/h (EvoTape/WinTape concept). To this end, the new systems concept saves space, handling and – above all – energy. Energy consumption of just 0.4 kWh/kg is a further decisive argument for the EvoTape/WinTape solution.

Geotextiles

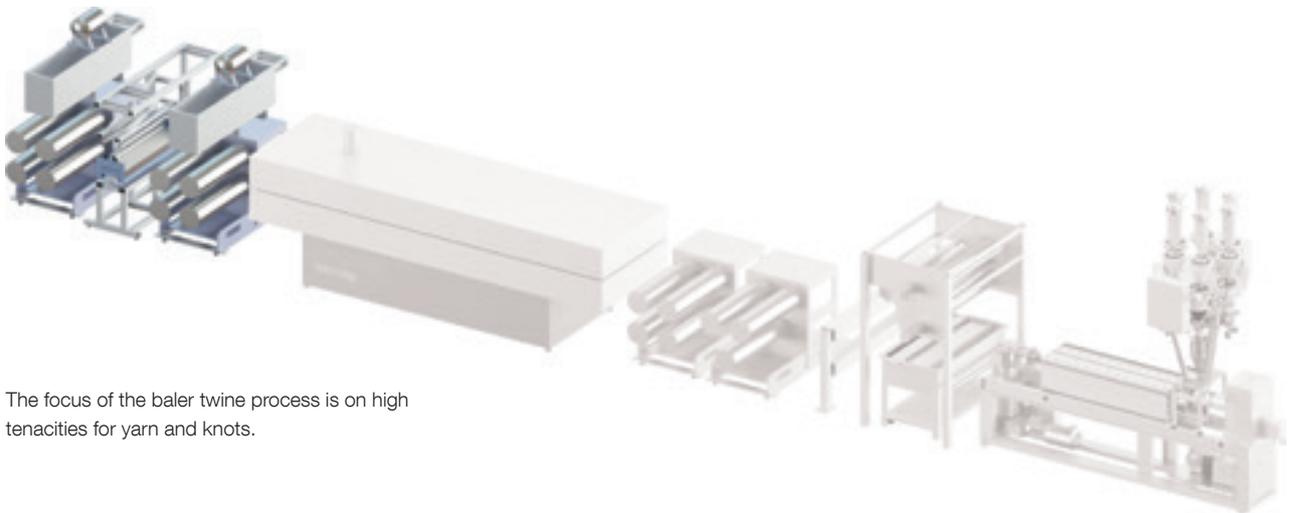
The EvoTape process also showcases its advantages for geotextiles and agricultural textiles. Here, high tenacities are achieved with lower overall draw ratios as well. For some applications, the addition of LDPE as a 'drawing aid' can be dispensed with, additionally securing a reduction in raw material costs for this process.

EvoTape & WinTape – the perfect duo

In an age in which investment decisions are also influenced by sustainability considerations, the EvoTape / WinTape concept has set a new standard. Greater output with the reduced deployment of energy and personnel, less waste and a faster return-on-investment (ROI) make the new tape system from the Chemnitz-based Oerlikon Barmag extrusion technology experts a real alternative.

With the EvoTape/WinTape duo, the tape market now has a concept that is also a prudent replacement investment as a result of its immense efficiency. The concept only unveils its full potential as a duo of perfectly coordinated components: here, high extrusion process speeds can only be efficiently realized with an automatic winder. Conversely, although connecting an automatic winder to a standard extrusion system makes sense, it is unable to reveal its entire performance spectrum.

In terms of tape quality, the EvoTape & WinTape combination makes no compromises: the familiarly superlative product quality promises tape manufacturers a position within the high-end market. (bey, jwe)



The focus of the baler twine process is on high tenacities for yarn and knots.

WINGS POY 1800

successfully launched

With its 1800-mm stroke length and with 12 or 16 ends, the WINGS POY – which was first premiered to the wider public at the ITMA Asia – is finally ready for serial production.

The successful operation of two pilot lines for both standard and specialty yarns prove: operation window, performance, package build and yarn quality are at the same high level as in the case of the 1500-mm stroke-length model. This guarantees superlative results in the DTY process.

With package weights of 15 kg (12-end variant) or 10 kg (16-end), the winding unit with extended stroke is extremely competitive. The optimized design permits production costs to be further optimized compared to concepts to date and competitors, while continually shortening the amortization period for systems.

Special highlight: string-up for the WINGS 1800 is now even faster with its new string-up device – despite its 12 packages. The new technology saves around 30 precious seconds compared to its 10-end counterpart – hence making it considerably faster than its competitors. The result: less waste.

Furthermore, the WINGS POY 1800/12-end excels vis-à-vis the 1500/10-end model, requiring less space per filament, hence further increasing efficiency. The difference in the required space for the zigzag layout of the spin packs is even more noticeable, where the 16-end winder is able to reveal its advantages even better, which makes it interesting for in-house further processors in particular, despite its lower package weight.

With already more than 3,000 orders predominantly from core markets, the latest member of the WINGS family is well on its way to becoming a successful product. (bey)



The first two pilot lines of WINGS POY 1800 are successfully producing high quality yarns.

Polypropylene spinning technology with VarioFil

Although many methods and techniques have been used to make polypropylene dyeable, for most applications polypropylene yarn continues to be dope dyed. Hence, in contrast to the production of commodity yarns made of polyester or polyamide, many product changes are unavoidable. Frequently, only relatively small batches of one specific color are required. To succeed in this market, very flexible production installations are necessary to economically manufacture a large variety of products. However, high availability of the production line is an important matter.

In 2002, the VarioFil compact spinning line was launched on the market. It combined both requirements – the flexibility of a compact spinning machine and high availability – by using Oerlikon Barmag components tried and tested in large-scale lines for commodity products.

Now, another step has been taken towards increasing the flexibility and efficiency of the VarioFil system by integrating the WINGS technology into the VarioFil concept. This has opened up new possibilities in the design for increasing product quality and handling.

A well-known fact, polypropylene has a high coefficient of friction and has to be handled very carefully when guiding the yarn through the machine. Otherwise, at friction points, e.g. yarn guides, the yarn tension becomes excessive, too much heat is generated and hence the yarn quality suffers and the number of breaks increases. The WINGS technology uses rollers at all critical deflection points. This permits a machine design with a lower height in the take-up and complete operation of the take-up from floor level, while maintaining the overall advantageous vertical machine concept. The yarn path through the machine is reduced and string-up is simpler and faster.

Yarn traversing is carried out using a birotor system – in other words, without yarn guides with reciprocating motion, which are subject to wear. Continuously rotating birotor yarn guides permit the utilization of a wide range of winding angles without any influence on the winding tension. This permits numerous options for ribbon disturbing methods. In turn, this enables both perfect package formation and excellent unwinding conditions.

Efficiency, quality and production of a high variety of products even in relatively small batches need not be a contradiction with optimized production equipment.

Today, optimized equipment allows the production of polypropylene yarns with 10 yarn ends and winding speeds of 4,800 m/min and more. (hgh)



Barmag Brückner Engineering's (BBE) compact spinning line VarioFil processes polypropylene with WINGS technology.

All under control

Online quality management with Plant Operation Center (POC)



Plant Operation Center (POC) is the all-embracing workflow management system from Oerlikon Manmade Fibers. It is designed to detect and optimize the production processes within a production stage, e.g. spinning or texturing, and/or over all the production stages – starting with the raw material all the way through to the end product.

At the same time, POC has been extended with a view to integrating all levels of internal order handling. The high degree of modularity, scalability, and system openness makes POC a perfectly tailored solution enabling a simple start and including the possibility of continuous upgrading.

Depending on the settings, this enables the monitoring of processes at any time and from any place. But what exactly does process monitoring have to do with quality management? A closer look at a concrete example makes this clear:

Scenario

A complete plant design project was delivered to a Chinese filament yarn manufacturer and comprises the crystallization, dryer, air-conditioning, extrusion, spinning and take-up process steps and components. All listed systems and process stages are connected to the POC. To this end, all process signals relevant to the package quality are continually monitored and archived.

Workflow

The modular concept of the POC permits tailored solutions for customized requirements. The following quality-relevant modules were deployed in the case of the project described:

Recipe management

As standard, recipe management includes all target values for the above-mentioned systems and/or process stages. Furthermore, it includes – for each process signal – the

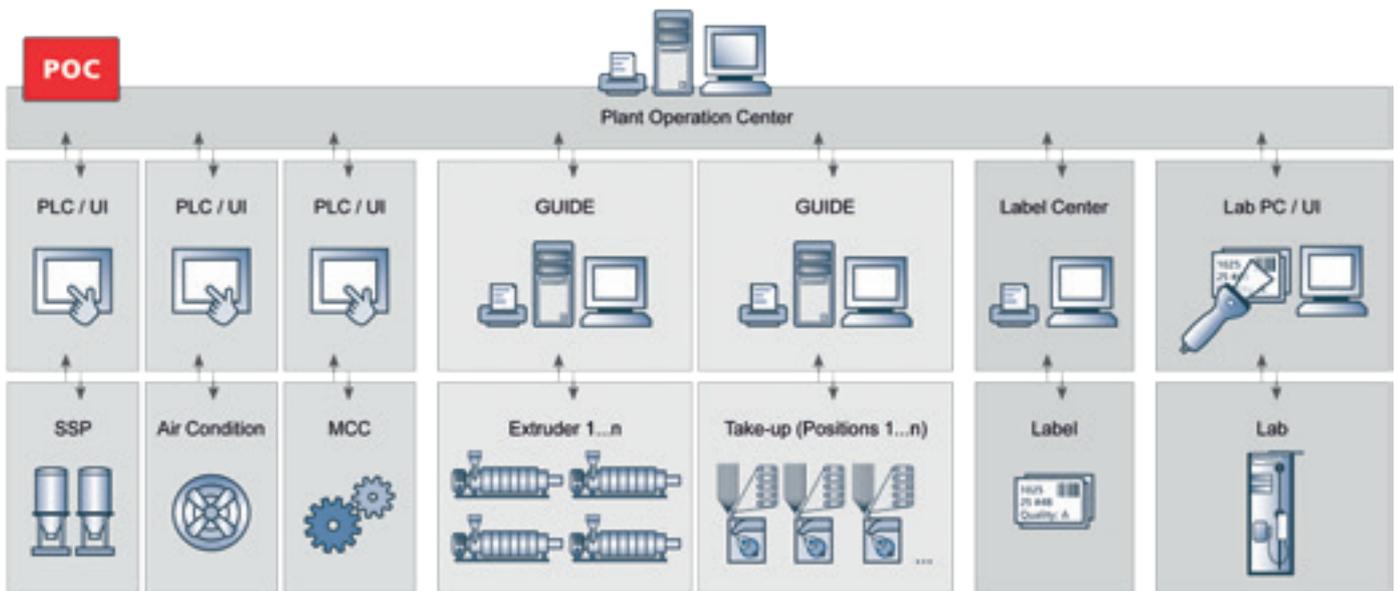
threshold values (warning, alarm and downgrade) relevant to online quality management. The values are set by the operator and archived in the POC as part of the recipe of the respective product.

Tag logging, trending, alarm limit violation monitoring
The process signals are continually recorded and archived and can be displayed as curve progressions. Threshold value breaches are identified, archived and logged. Various display options support online and offline evaluation.

Online quality management

Among other things, the information as to which positions (or yarn paths) a quality-relevant event can impact on is archived in the POC for each process signal. Hence, a threshold value breach in the extruder temperature, for example, affects all positions running 'under' this, while a deviation in the godet temperature merely has an impact on one single position. To this end, the POC immediately provides information on any potential quality downgrade.

Depending on the configuration, breaching a 'downgrade' threshold value results in a downgrade of the 'online quality' for one or more positions or yarn paths. Subject to the duration of such a quality-relevant threshold value breach, this will impact on one or more winding cycles. This event is additionally recorded per position or yarn path as 'latched quality'. The degree of the downgrade ('A' → 'B' - 'C' – etc.) is configured by the operator. 'Latched quality' documents the poorest quality within the winding cycle.



The online quality management system separately and immediately reports quality-relevant events for each position. Hence, yarn manufacturers have their production processes continually under control and can react to quality-relevant influences quickly.

Plant overview

All the current actual values of the position are graphically and numerically presented in the 'position detail'. Furthermore, the current 'online quality' and 'latched quality' quality stages are displayed per position (or yarn path) with the online quality management system.

Reports & statistics

The standard version has various reports with different views and filters – production report, shift report, etc. – at its disposal. Additional online quality reports now evaluate both the running length category and the 'latched quality'. To this end, the ratio of full packages with 'A' quality can be displayed at all times according to shift or according to product, for example. This is displayed as an additional performance figure in the POC.KPI.mobile module. Additional reports and statistics are provided for the evaluation of the downgrade and its causes.

Labeling

The operator decides which data identified via the package are printed on the label and in which format. As an additional parameter, the online quality management system can now also be used to print out the 'latched quality' of the package.

Conclusion

The Plant Operation Center (POC) is far more than just a process monitoring tool; it manages processes, products and product quality. Its online quality management system not only provides information on whether a position is winding full or short packages; the system also evaluates whether the package and yarn are A, B or C quality. On the one hand, the POC therefore simplifies and streamlines the downstream process steps, but – above all – it provides the yarn manufacturer with the possibility of influencing the production result in a timely manner. In the described case, the Chinese yarn manufacturer was able to significantly improve its processes and its yarn quality with the help of the POC online quality management system. (rmü)



The POC.KPI. Mobile module ensures that everything is under control at any time and from any place – this applies not just to the quality, but also to the performance and the profitability of the plant.

Staple fibers: specialty yarns on trend

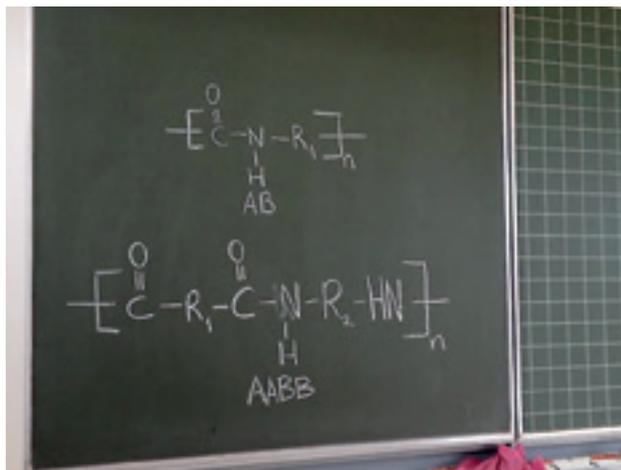
The trend within the staple fiber sector is currently veering towards smaller systems; they are being deployed for the production of fibers for industrial and specialty applications such as geotextile fibers, bonding fibers and bicomponent fibers.

And this is very much reflected in Oerlikon Neumag's order books: over the past few months, the Neumünster-based company has received several orders for staple fiber systems for specialty products. A two-step system with a 50 tons/day capacity is destined for the production of bicomponent fibers, an inline system with a 20 tons/day capacity will soon be manufacturing fibers for nonwoven applications and a two-step system with a 40 tons/day capacity is being designed for processing PA6.6

However, the system for manufacturing polyamide 6.6 fibers is not what you would call an everyday project: on the one hand, PA6.6 is not a standard polymer and requires a reliable, easy-to-clean system. On the other hand, engineering competence is of the essence here, as one fiber line is serviced by two spinning systems, one a direct spinning system and one an extruder spinning system. Here, decisive for winning the order was – as in the case of the other two projects – the extensive experience and unparalleled competence of the Neumünster-based systems builder.

Modification: market-oriented production by converting systems

The Customer Service Modifications team registered its largest order – with a project worth several million – since being established. The order comprises the conversion of a staple fiber system from monocomponent to bicomponent technology. Both the conversion and recommissioning of the system will take place in 2015. (che)



80 years of Nylon

A milestone in the history of manmade fibers

In August 1934, the American Wallace Hume Carothers, head of research at the American chemical company DuPont at the time, invented a synthetic fiber made from polyamide 6.6. With its brand name – Nylon – this manmade fiber went on to conquer the textile world. At the time, Nylon was the only fiber that was manufactured entirely synthetically. The innovative fiber was an excellent alternative to real silk, hence becoming a strong competitor to the Japanese silk monopoly. Ladies' stockings and toothbrushes were manufactured from Nylon and enjoyed huge popularity; further applications for the material during this period included parachutes, ropes and other military equipment.

Wallace Hume Carothers was born on April 27, 1896 in Burlington and embarked on his academic career in 1924 as a faculty member at the University of Illinois. Two years later, Carothers switched to Harvard University as the project manager for organic and structural chemistry. When DuPont opened a new research laboratory in 1928, the chemist switched from academia to industry. As head of research, he focused on the development of synthetic materials and plastics. Two years later, Carothers and his team discovered neoprene. A further four years of intensive research were required to finally develop Nylon. At the age of just 41, Wallace Hume Carothers passed away on April 29, 1937, leaving – with Nylon – a material that is today an absolutely integral part of both textile and industrial applications. (lk)



Yarn manufactured on Oerlikon Barmag's WINGS FDY has been warp-knitted on Karl Mayer machines during ITMA Asia.



Quality polyamide yarn producer Stilon S.A. relies on WINGS POY technology.

Karl Mayer convinced by WINGS FDY yarn

FDY (fully-drawn yarn) – spun on a WINGS FDY production system in China – ran on a two-bar warp-knitting machine constructed by Karl Mayer at a speed of 3,000 revolutions per minute and without any yarn breaks. However, manufacturing the high-end warp-knit fabrics did not take place behind closed doors; it was openly shown to all interested visitors on the newly-developed high-speed warp-knitting machine at the Karl Mayer stand at this year's ITMA Asia, at which it was premiered. The smooth operation completely convinced the warp-knitting machine manufacturer – headquartered in the Hessian town of Obertshausen and which is hugely successful, particularly in the high-end market. "We are considering defining WINGS FDY yarns as the standard for our machine development", comments Klaus Schulze, Product Manager for high-speed warp-knitting machines.

The two German market leaders have been maintaining an intensive dialog for many years now and this exchange of experience is benefiting customers of both companies: the close contact with upstream and downstream production stages enables the companies to better prepare their own customers for market and product trends and to optimize the required machine technology in good time. (bey)

First polyamide 6.6 POY systems with WINGS concept operating within the market

Four POY spinning systems for polyamide 6 and polyamide 6.6 were recently successfully commissioned at Polish yarn manufacturer ZWCH Stilon S.A. With this, the quality yarn producer from Gorzów-Wielkopolski is the world's first yarn manufacturer to exploit the benefits of the WINGS concept for spinning polyamide 6.6.

In addition to the entire spinning plant – from the extruder to the take-up unit – the project also included four times 288 texturing positions. To this end, the further processing facilities at Stilon are also state-of-the-art with Oerlikon Barmag eAFK-type texturing machines.

Traditionally, the key market for Stilon's products is Europe; the manufactured yarns are predominantly used in the production of hosiery as well as warp knitting applications.

The WINGS winder for polyamide 6.6 was presented to a wide trade audience for the very first time at this year's ITMA Asia. Due to its special polymer characteristics, the polyamide 6.6 process is considered to be particularly challenging and requires the yarn manufacturer to have reliable process know-how. (bey)



Site manager Steffen Husfeldt (left) and Oerlikon Manmade Fibers COO Georg Stausberg laying the foundation stone for Chemnitz's new R&D center.



Partner of China's textile industry for 50 years: Oerlikon Barmag and Oerlikon Neumag.

Oerlikon Barmag Chemnitz on growth trajectory

Oerlikon Barmag expands its Chemnitz site. September 9 saw the laying of the foundation stone for the new 1,600 m² R&D center. From July 2015, this will be used primarily to develop and test extrusion systems for tapes and monofilaments along with winding/texturing machines, twisting machines and carbon fiber winders. As to date, the new think-tank will also be available for customer tape and monofilament trials and their further processing. With this, the state-of-the-art R&D center and its integrated laboratory and training center will offer the international extrusion systems market leader's clientèle superlative conditions for developing new products. (bey)

From pioneers to market leaders

In 1964 and 1966, Barmag and Neumag, now business units in the Oerlikon Manmade Fibers segment, supplied the first machine technology to China. 50 years on, the export pioneers are highly respected high-tech manufacturers for China and reliable partners of its textile industry, which has made it to the top of the global manmade fiber industry with technology "Made in Germany".

Visitors to ITMA Asia + CITME 2014 celebrated a remarkable anniversary with Oerlikon Manmade Fibers this year: 50 years of partnership with the Chinese textile industry. For half a century now, the company has been supplying man-made fiber spinning plants to the People's Republic. The managers of what was then the Remscheid-based Barmer Maschinenfabrik AG in Germany, or "Barmag" for short, laid the foundation back in the 1960s for today's excellent business relationship with the world's biggest producer of polyester and polyamide. Neumag followed shortly afterwards in 1966. (aw)

For a deeper insight see the poster attached.



DTY market in motion

The Oerlikon Barmag incoming orders for DTY machines in the first six months of 2014 reflect the movement in the Asian market for textile machines.

To this end, the Chinese market reveals a fall in demand and local investment resulting from a change in the macro-economic situation within the first half of 2014. In parallel, investments have predominantly developed in the South-East Asian region very positively, hence compensating the market development within China. Furthermore, there is an upturn in the demand in the Americas and Europe. The focus for investment in the East Asian region for both the manual eFK-type manual and the automatic eAFK texturing machines was on Vietnam, Indonesia and Korea. Currently, it is predominantly replacement investment that is taking place in Korea.

Vietnam and Indonesia are presently the preferred countries for foreign direct investment (FDI). In addition to the lowest wage costs in Asia, they promise excellent availability of qualified personnel and comparably low or competitive electricity prices. On the one hand, they additionally offer – through free trade agreements – access to both markets in the European Union and the US and, on the other hand, permit low-cost partial manufacture within the Asian region through their membership in the Association of Southeast Asian Nations (ASEAN).

Vietnam is profiting from growing domestic demand and, in particular, from foreign direct investment due to the pending ratification of the TPP (Trans Pacific Partnership), which is affecting not just the textile sector, but also many other industries.

Indonesia – with its huge domestic market and existing textile industry along the entire textile chain – continues to predominantly invest in the manual eFK. Here, there is diversification taking place through focusing on specialties and niche products insofar as it does not relate to in-house manufacturing along the production chain. (as)



Events

CINTE Techtexil

September 24-26, 2014, Shanghai, PR China

www.cinte-techtexil-china.hk.messefrankfurt.com

Bondexpo

October 6-9, 2014, Stuttgart, Germany

www.bondexpo-messe.de

ITMF Annual Conference 2014

October 16-18, 2014, Beijing, PR China

www.itmf.org

OTM Middle East Textile Machinery Exhibition

October 16-19, 2014, Gaziantep, Turkey

www.otm2014.com

PCI Fibres Istanbul Conference

November 6-7, 2014, Istanbul, Turkey

www.pcifibres.com

International Conference on Technical Textiles & Nonwovens

November 6-8, 2014, Delhi, India

www.textileconferenceiitd.com

Feipur & Feiplar

November 11-13, 2014, Sao Paulo, Brazil

www.feiplar.com.br

Filtration2014 International Conference & Exposition

November 18-20, 2014, Baltimore, USA

www.inda.org

Domotex

January 17-20, 2014, Hanover, Germany

www.domotex.de

Oerlikon Neumag BCF Symposium

January 19, 2014, Hanover, Germany

www.oerlikon.com/manmade-fibers

BBE Open House

January 21, 2014, Remscheid, Germany

www.bbeng.de

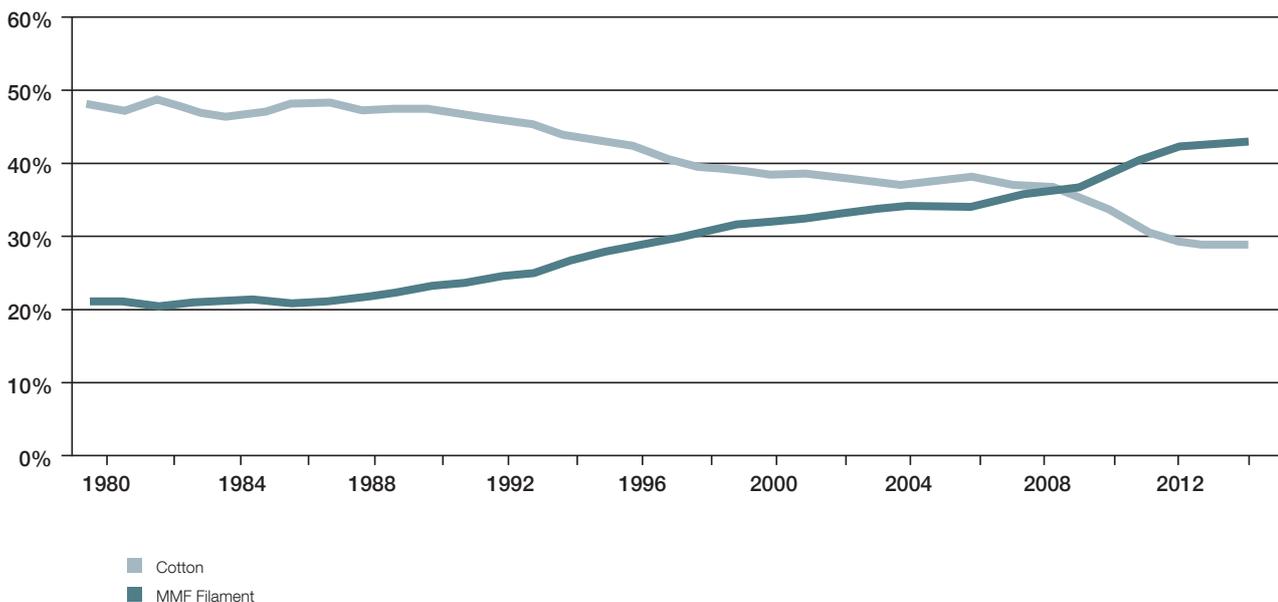
PCI Fibres Red Book

Textiles in China: the move towards filament

The latest issue of the PCI Fibres Red Book, just published, is primarily concerned with acrylic, nylon and polyester supply/demand. But this latest issue also takes into account recent events in the cotton market, and their impact on manmade fibres, particularly polyester textile filament. This might seem a strange relationship: cotton and polyester textile filament directly competing with one another, but this is indeed the case. Polyester textile filament has developed into an extremely diverse and varied product, like a chameleon able to change into many forms; in this case the worsted-look, the silk-look and also the cotton-look. Within the cotton industry this is not fully recognised as yet, and the manmade fibre competition is always seen as polyester staple and then viscose staple. But the synthetic filament industry knows better, and this is why, as the numbers demonstrate, polyester textile filament has had such huge success. The question now is how to maintain this success, not necessarily through volume but specialisation.

Filament textiles are largely made from manmade fibres (MMF), such as acetate, rayon, nylon, polypropylene and especially polyester. There is however also a filament textiles business in natural fibres since we must not forget silk, the queen of fibres. This note however concentrates on the MMF part of filament textiles which in 1980 was reckoned to make up 20% of a total market of nearly 30 million tons across all applications, apparel, household and technical. Cotton at that time had a 48% share, so that, with acrylic, viscose and polyester, the whole short-staple spinning sector, whether as blends with cotton, or in 100% form, made up 57% of the market in 1980. The balance of 23% was made up of long-staple textiles in the worsted and woolen spinning systems and also nonwovens. Within the mix, polyester textile filament had a global share of 7%.

Global shares of cotton and MMF filament



By 2014, in a total market estimated in the just published PCI Fibres Red Book to be just over 80 million tons, cotton's share is reckoned to have come down to 28%, but with all forms of short-staple textiles at 42%. MMF filament textiles are put at 44% with the balance of long-staple and nonwovens now at 14%; the long-staple element having declined considerably and that for nonwovens grown strongly. Overall, the polyester textile filament share has grown to an amazing 32%. The well-being of the whole fibres market is now closely associated with that of polyester textile filament.

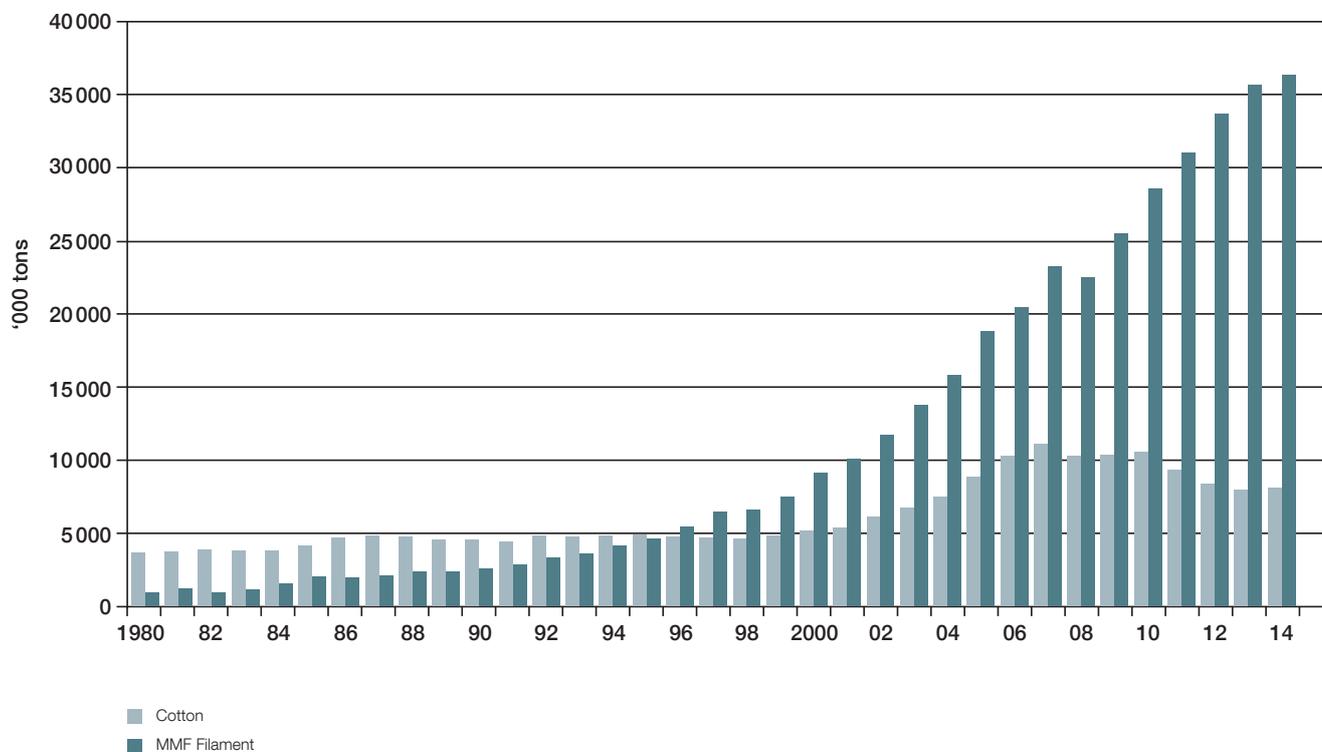
Cotton has lost share, but not volume; since 1980 having increased from 14.3 million tons to an estimated 24.3 million in 2014. In that period however MMF filament textiles have grown from 6.1 million tons to an astonishing 37.4 million. Filament textiles, as well as being able to imitate other textile forms including those based on staple fibres, offer a very wide range of effects, some quite new. Filament textiles also offer ease of production and then easy care in use; they offer security of supply and, because of this, relatively stable pricing, although this might not always appear to be the case.

Compared with cotton, MMF filament did not experience to anything like the same extent, or to the same duration, the price-spike of 2010/11 which so much weakened downstream confidence in cotton. And since then MMF in all its

forms has not experienced the effects of the massive build in cotton reserves in China, which even today continue to grow, if very slightly, in spite of changes in policy. Typically manmade fibre producers carry very little stock, only enough to service the immediate business; although this is not to say that stocks of MMF products might not increase lower down along the textile pipeline.

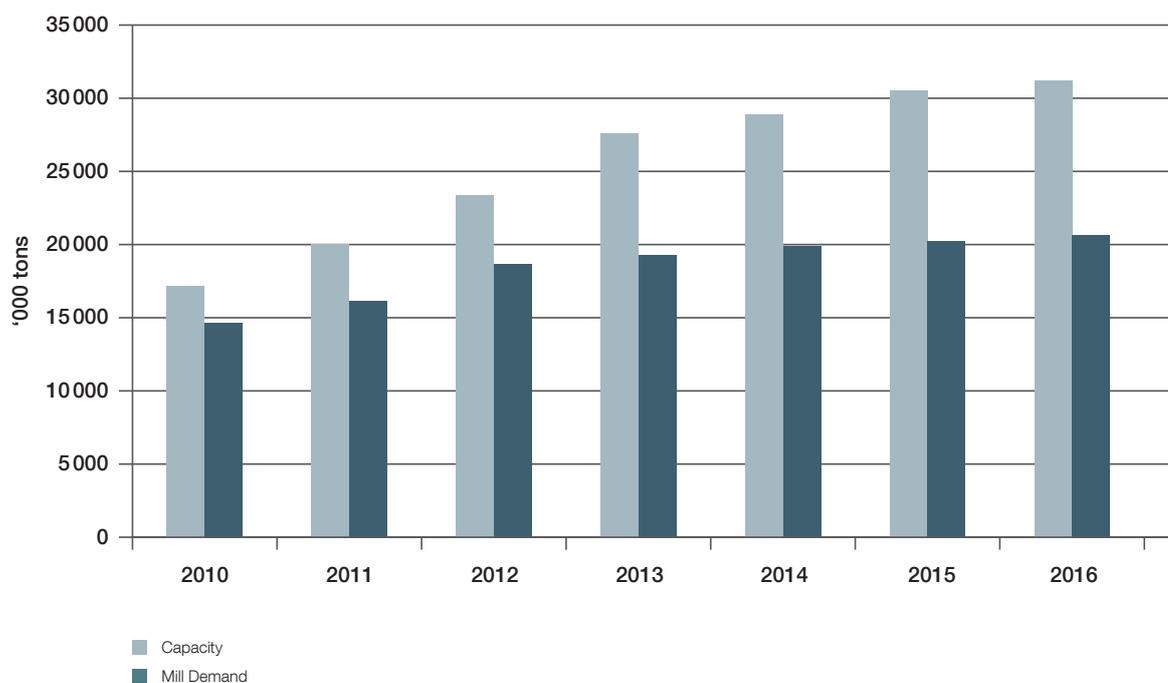
The pattern of change in global cotton referred to above is not exactly the same for China. In the Chinese market cotton's share of consumer demand has indeed fallen, but to a far greater extent: from 71% in 1980 to an estimated 13% in 2014. And cotton has also lost actual volume in China's consumer market: declining from 3.1 million tons in 1980 to some 2.6 million in 2014. Meanwhile Chinese consumer demand for MMF in all types has risen from 1.1 million tons to 16.4 million; with market share moving from 3% to 86%. Clearly, this change has been supported by policy decisions aimed at widening the consumer market in China without increasing the strain on resources. Immense investment has been encouraged first in MMF apparel and then, moving upstream, in textiles and fibres, and more recently in fibre raw materials. At the same time the development of local infrastructure, technology and equipment has been fully supported in successive 5-year plans. And, most of all, this development has proved acceptable to the Chinese consumer. It is fascinating to be told in a Chinese shopping mall that a particular line of clothing contains no synthetic fibre whatsoever when every single garment is in polyester filament.

China: textile demand in cotton and MMF



Source: PCI Fibres Red Book

Polyester textile filament in China, capacity and mill demand



Source: PCI Fibres Red Book

Over the last three decades the MMF textiles business in China, in all its forms, has been running very strongly, breeding a confidence in the product which has in turn fed back into further expansion. In contrast, at least in recent years, the cotton textiles sector has witnessed a policy of restraint that has led to very high fibre prices in China, and the effective transfer of short-staple yarn-spinning to other markets; largely, but not entirely, involving cotton. This transfer has come in two forms: as a movement offshore into South East Asia by Chinese mills, and as an import of spun yarn back into China from competitors in the Indian Subcontinent and from elsewhere, even the USA.

The cotton sector in China now faces a further attack from MMF filament expansion. Polyester textile filament capacity has expanded rapidly in China, from 0.6 million tons in 1990, to 4.5 million in 2000, to 17.8 million in 2010 and to 29.0 million today. This has increased China's share of global capacity in polyester textile filament from 14% to 76%. And, although China's share is levelling out as funding

is constrained, and as India expands again, there is still new capacity coming on-stream; with 1.8 million tons reckoned to be arriving in China this year, at least another 1.6 million tons committed for next year and a further 1.0 million tons in the system for 2016 – all at a time when Chinese mill demand for polyester textile filament is growing more slowly, according to the latest PCI Fibres Red Book analysis, by just 340,000 tons this year, 450,000 tons in 2015 and 520,000 tons in 2016.

Much has been made in the general media of China's growing debt burden and the declining returns to be made from investment in general. The Chinese polyester textile filament industry is no exception. Indeed, as is so often the case, changes in the textiles market prefigure those in the economy at large. For many markets textiles activity is a leading indicator; a useful guide to future GDP growth.

Local demand for Chinese textiles is not growing as quickly as so many expected, inside and outside China; yet capacity is still being expanded rapidly at every level. To try and maintain operating-rates therefore, the Chinese fibre-producers are obliged to export more and more of their production, including polyester textile filament. But, even so, capacity utilisation for this fibre type is dropping in China: from the profitable 84% of 2010 to a loss-making rate that is now close to 70%.

There is not however the scale of textile activity in other regions big enough to absorb the surplus material from China. The Chinese polyester industry is therefore facing a massive shake-out, with many older plants finally being closed down, and only the best of the new investments surviving. In future new synthetic filament plants, of which there will be many, will have to carry a justification for the investment, in the form of a fully formed and coherent marketing plan.

Cotton might resist some of this pressure, at least in the short-term. Cotton textile activity in China is much reduced and cotton prices are weakening. Cotton volumes might well have over-compensated for the pricing problems of earlier years and fallen too low, at least for now. PCI Fibres therefore expects a small recovery in cotton's global share. The long-term trend however still favours the MMF range of products, especially in synthetic filament. But it is a matter first of rebalancing the market, and within this process putting more and more emphasis on specialisation in product type. (pd)



PCI Fibres is a specialist consultancy to the fibres and related industries. Its services include multi-client and single-client studies. The company provides monthly, quarterly and annual reports covering the major manufactured fibres and raw materials for acrylic, nylon, polyester and viscose as well as related products.

For further information contact
info@pcifibres.com



Hidden Champions



As a member of the Customer Service Modification team, Rüdiger Schmitt turns old into new.

Extended life time – modernization and retrofit solutions for maximum performance

Oerlikon Neumag systems are still being used even decades after being purchased. Over time, changes in the process requirements or availability of parts may lead to necessary changes in a machine. Whenever this arises, the Oerlikon Neumag Customer Service Team steps in, providing advice, retrofit and modernization solutions and active support.

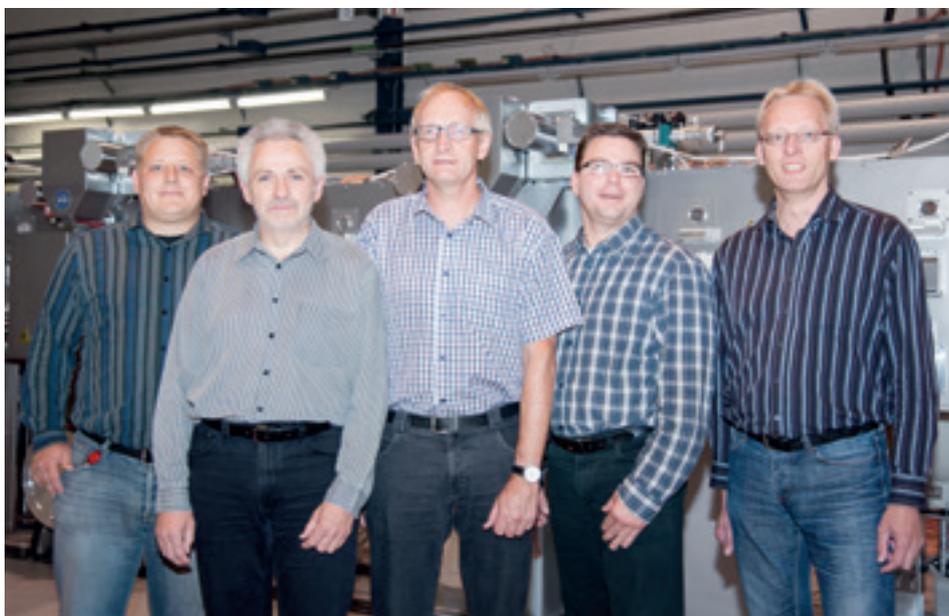
As an integral part of the Customer Service team, a group of experts focuses on retrofits and modernization projects in accordance with customer specifications. The aim is to assist with an efficient and profitable process for customers even under changing process requirements and aging equipment. Here, the actual age of the systems plays (virtually) no role at all. “We have drawings relating to systems that go back almost to the founding days of Neumag. The oldest machine that we have been allowed to modernize was one originally constructed in the 1960s”, explains Rüdiger Schmitt. “In this case, we replaced an old crimper in a two-step staple fiber plant with a new one, optimizing the process with the new component and considerably improving the product quality at the same time.”

At the beginning of a project the team of experts discusses the requirements of the customer in detail and inspects and analyzes the existing equipment. The analysis of the system will provide the scope and scale of the conversion. “We advise the customer on all technical aspects as to which conversions are possible, and sensible, in their specific case to achieve the desired objective. If, for example, the objective is to reach a higher level of energy efficiency, we will take a look at the motors and other electronic components”, explains Markus Schmidt, talking about the project schedule. And there is a further key issue when it comes to the electronics: Spare parts are no longer available for many old components, which means they have to be completely replaced. Here, retrofitting is the name of the game. “In such cases, the retrofit products are tested by us in-house. Our goal is always to keep the cost for customers to a minimum and find plug-and-play solutions that require as few adjustments as possible.”

In most incidents, the customer wishes to switch the specific product they are manufacturing: polymer changes, production of yarn for special applications (e.g. automotive industry), special color modifications (e.g. CPC) or converting a monocomponent staple fiber plant into a bicomponent system. Often the project includes an installation and start-up phase that is accompanied by skilled Oerlikon Neumag staff. In parallel, the team is in close contact with the customer to ensure smooth progress.

The different experts focus on different specific areas, but are all able to keep the whole process in mind. Although they each have specialized as a result of their training, education and professional background, they all require a profound knowledge of electrical and mechanical engineering. Today, the team brings together approx. 45 year of competence. And the modernization and retrofit experts accompany their Customer Service team colleagues whenever a deeper technical consultancy is required.

However, conversions are not always worthwhile. “Compared to old and modernized equipment, new systems can be more efficient. When we look at all details of our customer requirements and the current status of the machine, we can estimate whether the investment in a modernization is worthwhile or not. In the event it is not, we advise customers to consider investing in new equipment. Here, we work together closely with our sales colleagues in order to identify the optimal solution for our customers”, comments Rüdiger Schmitt. (che)



The Oerlikon Neumag modernization experts focus on converting and modernizing older systems in accordance with customer specifications. From left to right: Björn Mäkelburg, Markus Schmidt, Jörn Andersen, Rüdiger Schmitt and Jens Freudenberg.

Oerlikon Manmade Fibers reinforces service partnership **Customer proximity showcased**





Markets are constantly moving and are subject to ongoing change. Also changing with them are the requirements and demands that market players make on their suppliers. Oerlikon Manmade Fibers has recognized this and will be targeting its future global service offerings more specifically at the requirements of its customers. The new service structure promises customers closer partnership and liaison for even greater performance.

Under its 'Partnering for Performance' motto, the Service division with its two brands – Oerlikon Barmag and Oerlikon Neumag – is now focusing on five central performance fields, each with diverse individual activities:

The **start-up services** field comprises professional project management along the textile process chain from compilation, set-up and assembly all the way through to commissioning. Experienced managers, engineers and technicians support the customer in questions relating to both processes and products as well as in handling the entire project. In close collaboration, the systems and processes are tailored to the specific requirements of the customer.

And **technical support** is available for troubleshooting, with the objective of finding a solution as quickly as possible and to get production up and running again – wherever it happens to be in the world. Nowhere else is the expression 'time is money' as apt as it is in the case of a slowdown in production or a production standstill. With its highly-qualified experts, a 24-hour service hotline and its global service network, Oerlikon Manmade Fibers offers the fastest reaction time and support for its customers. Regardless of whether on-site or by means of remote-access diagnosis, the aim is always the same: to restart production as soon as possible.

Within the context of the offered service partnership, the **advanced services** ensure that the customer is able to fully concentrate on its core business and exploit all market opportunities. For this, Oerlikon Manmade Fibers service provides everything required for guaranteeing smooth operations within the production facilities. Among other things, this includes support with repairs and maintenance planning and the corresponding workshops and warehousing solutions for the just-in-time provision of original parts.

Within the **operational efficiency** performance field, the Oerlikon Manmade Fibers experts support yarn manufacturers in their aim to operate production facilities at the very top of their limits in terms of productivity, quality standards and reliable processes. Among other things, the offerings range from the corresponding consultation, planning of maintenance and routine processes and procedures, quality assurance, etc. all the way through to internal and external employee training seminars.

Lifecycle management is targeted at extending the life of the Oerlikon Manmade Fibers machines and systems and hence best exploiting investments and increasing profitability (for details, see 'Turning old into new' article, page 4).

The Oerlikon Manmade Fibers service offerings comprise far more than mere problem solutions. The division regards itself as a partner to customers in search of greater productivity and performance. It's all about higher product margins and competitiveness – key factors in a challenging market. (wa)

'Zero harm to people'

Safety for customers and employees is the top priority

Health-safety-environment (HSE) – purely a company-internal matter? Not at all, believes Andrea Gießen, who is responsible for HSE at Oerlikon Manmade Fibers. The topic is not only of importance to the company's employees, it not only has an impact on our own energy consumption, but it also affects the staff and energy costs of the machine operators. And ultimately, these are also reflected in the purchasers' cost structures.

Golden Rules Basic for harm prevention

-  No person is allowed to work for Oerlikon or to visit an Oerlikon site without having received adequate safety instruction and training.
-  No person is allowed to override or interfere with any safety provision nor give orders to override or interfere with them.
-  Personal Protective Equipment (PPE) rules applicable to a given task must be adhered to at all times.
-  No person is allowed to work under the influence of alcohol or drugs.
-  All injuries and incidents must be reported.

Fibers & Filaments spoke to Andrea Gießen about the impact of Oerlikon Manmade Fibers' HSE program on customers and vendors.

Ms Gießen, health, occupational safety, environmental protection – none of these are exactly new topics. At Oerlikon Manmade Fibers, these topics have been playing a role for many years now. So, what is different now?

These topics were bundled together with the creation of my position two years ago, guaranteeing more intensive liaison for the three components; HSE has assumed a different position in the awareness of employees and managers. We ensure that employees and managers are committed to structuring work processes in a safe way and that they adhere to health and safety measures. Needless to say, the HSE team also advises on all issues concerning health protection, occupational safety and environmental protection and helps correspondingly optimize company-internal processes.

You claim that HSE also offers benefits to customers. What exactly do you mean?

Within the context of European legislation, we have been obliged for many years now to carry out risk analyses for machines and systems manufactured by us and to design the systems in a way that allows them to be operated safely. Employees who have received HSE training and apply this knowledge at their workplace on a daily basis also transfer this expertise to the construction and manufacture of our products. Correspondingly, the machines and systems supplied by us offer a high degree of safety. To this end, our 'zero harm to people' guiding principle also applies to our customers.

When it comes to environmental protection, we have been a trailblazer within the sector for many years now: it has been over ten years since we set the scene for this with the introduction of our revolutionary e-save program. Each and every one of our innovations is developed under the premise of energy-economics-ergonomics. And sustainability has developed into a genuine purchase argument over the past few years, not least due to increasing energy costs and growing worldwide environmental awareness.

What role is attributed to service staff here, considering they actually work at our customers' sites?

Our service staff are hugely important multipliers when it comes to the topic of HSE: they have to organize their own work on construction sites in such a way that minimizes risks to themselves and others. Here, they assume a very important role-model function. Furthermore, our service employees ultimately train our customers' staff to use our systems, meaning they also have a considerable influence on the operating personnel. In this way, service personnel sensitized to the topic of HSE instruct our customers' staff in handling and operating our machines and systems, ensuring that the risk of injury is kept to an absolute minimum. For our customers, this means fewer accidents at the workplace and consequently less downtime due to accidents.

If you sum up the past two years, what exactly have you achieved? And where does the journey go from here?

We have succeeded in firmly anchoring the topic of HSE in people's minds. And this is what counts. Ultimately, nobody can stand next to each and every employee all the time, ensuring that nothing happens. We have sharpened awareness among all parties involved and have sensitized them to the topic.

Where do we want to go with this? We want to become ever better. There is always optimization potential: new working situations, new systems, new employees and customers also represent new risk potentials. And these require new solutions and measures.

Ms Gießen, thank you for this very informative chat. We wish you continued success in your endeavors! (bey)

Andrea Gießen explains safety mechanisms of Oerlikon Manmade Fibers' winders. The five golden rules help to prevent harm.



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In addition to the full compensation of the CO₂ consumption connected with the printing processes Oerlikon Manmade Fibers used a high class recycling paper due to its demand for sustainable economy. The print version of this brochure is printed on "revive" by Deutsche Papier.

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