

fibers and **f!laments**

the experts' magazine

No. 34 | october 2020

Challenges and opportunities for the manmade fiber industry

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Factory know-how from a single source

page 14

Dear Customers, dear Readers,

Do you also greet people with an elbow bump? This form of greeting has meanwhile become a global symbol of our absolute determination to stay in contact with others and be active despite the risk of infection. This resolve is reflected in our own measures for dealing with the coronavirus pandemic as well as the unswerving, long-term master plans of major manmade fiber manufacturers, which are also securing our commercial stability. More on this topic in the interview on the following pages.

We are also trying to do an elbow bump greeting with our customer publication here. As we are unable to meet up at our trade fair stand, this magazine provides a safe and socially-distanced tour of our exhibition topics that we had planned to present at the now postponed ITMA Asia. Needless to say, digitalization and automation technologies play important roles, as they will help us through these difficult times – both now and in the future. In this edition, you will also be able to read about sustainability and innovations focusing on clean technologies and 'zero waste' for energy-efficient, environmentally-friendly manufacturing. Because it is not just coronavirus that is tangibly changing the world we live in, so too is climate change.

At the same time, we are leading the way towards our corporate mission: From Melt to Yarn, Fibers and Nonwovens. Along this stretch of the textile value chain, we have been striving for superlative quality for decades now – for fibers, yarns and hence all your textile products. For this, we offer our own technologies and comprehensive systems solutions, including project planning – therefore ultimately offering the entire factory from a single source. This concept is becoming increasingly popular.

However, the situation is today very different for many people. It is for this reason that I would like to reiterate a traditional Oerlikon principle: we will not let any of our customers down! Therefore, this issue of Fibers & Filaments includes numerous statements and examples of assistance by employees, experts and, in part, also customers. Their joint mantra is: we will find solutions – regardless of the situation! This necessitates interaction, information, consultation.

For this reason, let us continue doing the elbow bump. For the greatest possible degree of contact.



Georg Stausberg
CEO Oerlikon Manmade Fibers Segment



fibers and filaments

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Textile yarn manufacturer Fujian Billion kicks off IDY production in China **Largest single industrial yarn order**

From the end of 2020, yarn manufacturer Fujian Billion Polymerization Technology Industrial Co., Ltd. will be producing industrial yarns using systems supplied by Oerlikon Barmag. With this, the company – considered to be the largest polyester yarn manufacturer in southern China – is now also entering the industrial yarn market.

With 124 positions and a capacity of around 250,000 tons per annum, this project is the largest single industrial yarn order placed with Oerlikon Barmag to date. With this order,

Fujian Billion instantly positions itself as one of the ten largest Chinese industrial yarn producers. “The systems come with our latest draw unit design, which has been optimized for use with Oerlikon Barmag automation solutions”, comments Roy Dolmans, Head of Development for the Industrial Yarn Process at Oerlikon



The new Oerlikon Barmag systems at Fujian Billion will also be used to manufacture yarns for the automotive sector.

Barmag. As a result, the newcomer in the industrial yarn sector is now superbly equipped for the future.

The well-known company – located in the Chinese Fujian Province – will be predominantly manufacturing high-tenacity (HT) and low-shrinkage (LS) yarns from the end of this year. These sophisticated yarns are deployed both in the automotive, geotextiles and safety markets (HT yarns) and in the manufacture of coated industrial textiles such as truck tarpaulins and tents (LS yarns). Fujian Billion was founded in Jinjiang, Quanzhou, in 2003 and is one of the top 500 privately-owned enterprises in China. Annually, the yarn manufacturer produces around 2.8 million tons of filament yarn and ethylene-propylene side-by-side (ES) fibers. » (bey)

zhu, in 2003 and is one of the top 500 privately-owned enterprises in China. Annually, the yarn manufacturer produces around 2.8 million tons of filament yarn and ethylene-propylene side-by-side (ES) fibers. » (bey)

Energy-efficient yarn manufacture **Door to cationic-dyeable yarns opens further**

The to date largest system for cationic-dyeable yarns has been manufacturing in China with great success for over a year now. The Oerlikon Barmag installation, with a capacity of 600 tons of POY filament yarn a day, instantly catapulted the system operator into the vanguard of cutting-edge producers: with its high-quality products, the well-known Chinese yarn manufacturer has secured itself a 30-percent market share in China.

An additive in the melt ensures easier and superior uptake of dye, meaning that this special type of yarn uses very little water during the dyeing process and hence generates less environmental pollution. As a result of (chemically) modifying the polymer, the fibers or filaments score points due to the lower temperatures required within the dyeing process, while producing consistently brilliant dyeing results. The product is visually striking with its extremely shiny, lively colors. Excellent processing properties – with simultaneously extremely

low energy consumption and considerably reduced CO₂ emissions – ensure a high level of efficiency.

The high capacity and the favorable production costs associated with the direct spinning process make the yarn considerably more attractive for further processing compared to production methods to date. This opens up a new, broader application window for cationic-dyeable yarns, which have been produced worldwide using POY and FDY processes for 30 years on Oerlikon Barmag machines and systems. » (bey)



Cationic-dyeable products stand out with their extremely shiny, lively colors.

**Innovate Textile & Apparel
(Virtual Trade Show) 2020**

15. – 30. October 2020

Online, United Kingdom**Oerlikon Manmade Fibers
Webinar Series**

4., 11. November 2020,

2., 9. December 2020

Online, Germany

Scan me

ITMF Annual Conference 2020

20. – 22. October 2020

Seoul, South Korea**World Congress on Textile Coating**

19. – 20. November 2020

Berlin, Germany**The European Biopolymer Summit**

3. – 4. February 2021

London, Great Britain**Foam Expo 2021**

23. – 25. March 2021

Novi, Michigan,

United States of America**Polyurethanex 2021**

30. March – 1. April 2021

Moscow, Russia**Saigontex**

7. – 10. April 2021

Ho-Chi-Minh-City, Vietnam**Outlook**

21. – 23. April 2021

Lisbon, Portugal**International Nonwovens
Symposium**

9.– 10. June 2021

Lyon, Frankreich**ITMA ASIA and CITME,**

12. – 16. June 2021

Shanghai, China**Filtrex Asia**

19. – 20., July 2021

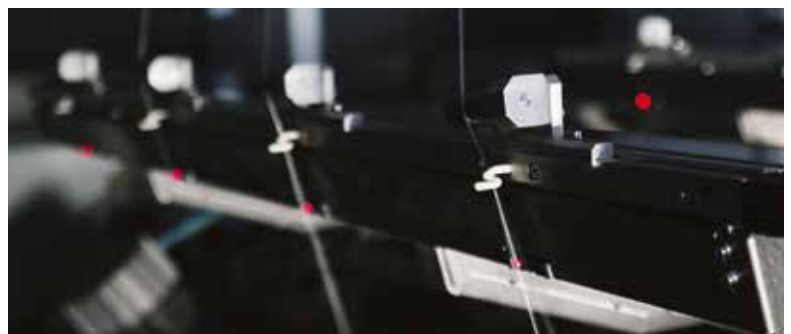
Shanghai, China**From Melt to Industrial Yarn****Polycondensation system ready for
use for industrial yarn production**

The Oerlikon Barmag Huitong Engineering joint venture, part of Oerlikon Manmade Fibers, recently commissioned a polycondensation system in China. The future operator will be industrial yarn manufacturer Jiangsu Solead New Material Group Co. Ltd., which is placing its trust in the OMF 'From Melt to Yarn' total solution philosophy.

An Oerlikon Barmag industrial yarn spinning system with a capacity of 350 tons a day has been connected to the system, which has a capacity of 600 tons a day. These are being predominantly used to manufacture high-tenacity (HT) yarns for deployment in the agricultural, infrastructure, transport, security and outdoor sectors. Potential products are yarns with up to 3 x 6,600 dtex of high yarn quality, low-shrinkage yarns for coating textiles, among other things, and so-called LDI yarns (high-tenacity, low-denier industrial yarns) for industrial sewing yarns. In addition to the polycondensation system, the extrusion equipment and spinning system, solutions provider Oerlikon Manmade Fibers is also supplying the complete engineering. The advantage for the customer: optimally harmonized process steps ensure high-quality yarn under economical production conditions. » (bey)



The industrial yarn project at Jiangsu Solead has become a 'From Melt to Yarn' total solution with the commissioning of the polycondensation system.



Industrial yarns have diverse applications. Jiangsu Solead predominantly produces high-tenacity (HT) yarns using Oerlikon Barmag systems

High-titer yarn for home textiles with WINGS HD and eAFK Big V **Greater bulk, greater efficiency**

Highly-bulky upholstery fabrics for furniture, decorative fabrics, drapes and carpets provide the feel-good factor in homes. And these kinds of high-end high-titer yarns are also used in automobiles; for instance, in seat upholstery, interior cladding and floor coverings.

For this, DTY yarns up to 1200 den and with up to 784 filaments have, as standard, been plied from four POY 300d/192f bobbins using DTY machines to date. However, half of the texturing machine's available winder positions remain unused with this process. Here, Oerlikon Barmag offers a considerably more efficient solution: the spinning concept with WINGS HD winding unit in conjunction with an automatic eAFK Big V Multispindle texturing machine is currently the only system on the market for manufacturing excellent quality high-titer yarns with maximum machine efficiency.

12 POY packages of up to 600d/576f (final) are produced in the spinning process using WINGS HD 1800. This is made possible as a result of an additional godet in the yarn inlet, which helps reduce the high yarn tensions. At the same time, a newly-developed suction unit with yarn cutting device ensures reliable handling of the yarn with an overall titer of 7,200 den (final) and 6,912 filaments. With this, the Oerlikon Barmag eAFK Big V multispindle texturing machine uses all winder positions and hence has the full production capacity at its disposal for manufacturing DTY yarns of 1200 den with up to 1152 filaments.

The high-performance multispindle machine can texture high individual titers of up to 600 den per single filament. The straight configuration of heater and cooling unit ensures particularly gentle yarn handling.



Superbly suited to the efficient production of high-titer yarns: the Oerlikon Barmag concept comprising WINGS HD and eAFK Big V

In this way, 576 texturing positions can be efficiently utilized when manufacturing high-titer yarns, which are then taken up using all 288 positions. And the flexible machine is particularly efficient in the high titer range of between 900 and 1200 den. The eAFK Big V texturing concept is already being successfully deployed by numerous yarn manufacturers. » (wa)



BCF S8

The next six BCF S8 tricolor positions are ready to be dispatched from the Neumünster-based assembly facilities. This system enjoys an excellent reputation across the globe and – in the tricolor variant with the CPC-T system – has created a new benchmark in terms of color separation.

A success – also against coronavirus

Three staple fiber bicomponent systems commissioned in China

Oerlikon Neumag has successfully commissioned three staple fiber bicomponent systems in China. With capacities of 50 tons per day each, the systems are being used to manufacture core-sheath bi-component fibers made from PP/PE or PET/PE at two long-standing Oerlikon Manmade Fibers customers. These fibers are used to make hygiene products.



Oerlikon Neumag staple fiber plants stand for highest product quality and absolute reliability.

A project not without obstacles: due to the coronavirus crisis, technicians from Neumünster were – for the first time ever in the history of the company – unable to travel to help Chinese colleagues on-site. The orders were completed without complication – not least as a result of the close, intensive collaboration and experience acquired over the past few years. “We clarified smaller and larger issues by means of video calls and remote services, allowing us to have the systems up and running perfectly within three or five months respectively. Since then, they have been manufacturing optimum fiber quality under stable conditions. This has once again demonstrated that standardization and optimization measures in assembly and commissioning procedures bear fruit”, comments Ingo Lobinsky, Head of Start-up Services at Oerlikon Neumag.

Oerlikon Neumag looks back on many years of experience in constructing bicomponent staple fiber systems. The first system for this fiber type was commissioned as far back as 1995. Oerlikon Neumag offers solutions for the most varied cross-sections, ranging from sheath/core, ‘side-by-side’, ‘island in the sea’, ‘orange type’ as well as ‘trilobal’. The applications are diverse: from self-crimping fibers, bonding fibers, super-microfibers all the way through to hollow fibers.

» (che)

imprint

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Talking to Georg Stausberg, CEO Oerlikon Manmade Fibers segment

Challenges and opportunities for the manmade fiber

The world has changed – at least since the outbreak of the corona pandemic new rules apply. Rules, to which we all had to get used to quickly, rules that Oerlikon had to set up itself for further successful market development. We spoke to Georg Stausberg, Segment CEO Oerlikon Manmade Fibers, about the time during the pandemic, the challenges to be mastered and the alignment of the product portfolio for a more sustainable future.

Mr. Stausberg, what kind of precautions did you take as a company during the Covid-19 pandemic?

Oerlikon actively began accompanying the coronavirus situation from a very early stage, deploying crisis teams at group and segment level. Extreme transparency, a high level of decisiveness and swift, pragmatic action were, and remain, the keys to successfully fighting the spread of coronavirus as well. The, in part radical, measures taken and the seriousness with which all employees have adjusted their personal behavior have ensured that the virus has had no chance to manifest itself at the Oerlikon Manmade Fibers sites to date. Maintaining the health of our employees worldwide was and still is the top priority.

How did your production, sales and order figures progress in the first half of 2020? How much did the pandemic affect your goals?

The sales markets for manmade fiber systems and equipment have been primarily located in China, India and Turkey for many years now. Together, these markets – above all China – make up the lion's share of the project landscape at Oerlikon

Manmade Fibers. And this is paying positive dividends at the moment. Because the production facilities of the major manmade fiber manufacturers in China have been systematically fired up again over the past few months, with capacity utilization increasing consistently. And, new projects are still being discussed.

But why is it so? And why is the manmade fiber industry currently practically going against the flow of the rest of the textile machine industry?

The reason is very simple: Long before the corona virus situation developed, the major manmade fiber manufacturers here in China had decided to reverse-integrate their production chains to include petrochemicals in order to expand their portfolios with targeted investments, to reduce their dependence on a 'single product', to optimize their costs and ultimately to acquire greater control over margins in a global volume business. Similar processes and decisions – albeit not on the same scale as here in China – have also been detected at the large manmade fiber manufacturers in India and Turkey. While China is

ent

opportunities for er industry

already pursuing and implementing its 'From Oil to Yarn' business model, the other market players are currently still focusing on the 'From Melt to Yarn' concept. Even though businesses in India and Turkey are presently still temporarily severely impacted by the coronavirus situation, their long-term commitment cannot however be questioned, as the company-internally-agreed master plans will be systematically implemented moving forward.





What impact will this have on the market and specifically on Oerlikon's business?

“All this has recently resulted in increased demand for spinning and texturing systems – just like those supplied by us. The investments in petrochemical systems are based on long-term strategic considerations and are resulting – even during the coronavirus pandemic – neither in short- and medium-term economic dips, nor in changed customer behavior. For these reasons, we are currently continuing to look positively towards the future at Oerlikon Manmade Fibers. With orders on our books until 2023, we have created a very good cushion for ourselves. We have to thank all our customers, who have consistently placed their trust in us despite the challenging times we are currently in.

What challenges and opportunities do you see for the future in the manmade fiber industry?

As machine and plant manufacturers, there is always one thing that will drive us all forward: sustainable technologies. We all strive for innovative industrial solutions for a better world. And how could we achieve this? We in Europe should all consistently follow the goals of the announced Green Deal of the European Union and produce climate-neutrally by 2050 – or better still much earlier. The whole textile industry should work close together on a global circular economy that recycles valuable materials. Digitalization with all its innovative possibilities, for example through the use of artificial intelligence, can and will help us in this. And last but not least, automation. The interaction of automation and digital processes

will ensure more sustainable Industrie 4.0 production solutions for the manufacture of manmade fibers and their production machinery and equipment.

At Oerlikon, we are already excellently positioned within the textile production value added chain. Technology solutions “From Melt

“With our Oerlikon technologies we define the quality of each consumer product within the whole textile value added chain. Because each high quality fabric is built on excellent yarns and fibers.”

to Yarn, Fibers and Nonwovens” are our promise to you. With our Oerlikon technologies we define the quality of each consumer product within the whole textile value added chain. Because each high quality fabric is built on excellent yarns and fibers.

We are currently realizing our vision together with our long-term customers. We are looking forward to an “Zero Waste” fully automated and digitized production plant. We are working of several projects in China and other countries to realize our mission: Clean Technology. Smart Factory.

We engineer those comprehensive plant solutions and offer them as a one-stop service to you. All quality influencing technologies are developed and controlled by Oerlikon. For sure, at the end in your production facilities, it's your stuff that is operating the machine equipment very easily thanks to an intelligent software

design and ergonomic machine design. This is part of our already in the year 2004 successfully introduced e-save initiative. And, also part of this e-save sustainability program is, that we are offering an energy-efficient and environmentally-friendly production that is also in line with your expectations.

Could you briefly tell us something about the technological innovations of your company, please?

I'd love to. But I have to concentrate on a few topics. Our product portfolio is so extensive that I can only point out a few things in the short time available. Let's start at the beginning of the production process. It all starts with polycondensation.

Our Joint Venture Oerlikon Barmag Huitong Engineering developed a lot of new features for the polycondensation and has been successful within the last years. I just like to mention some new developments:

1. The unique designed process tower adopts mixed packing, the glycol content of esterified water at the top of the tower $\leq 0.1\%$, which has obvious effect on saving heat energy, and the heat consumption is in the leading position in the industry.

2. The centrifuge type HTM pump has been promoted in the industry for a long time, with proper head and flow selection, which has obvious effect on energy saving, and power consumption is in a leading position in the industry.

3. The cooling tower is close to users. For example, the cooling tower is set on the top of the CP building and the spinning building respectively, which makes full use of potential energy, saves investment and energy compared with the planning of centralized cooling water station in the public utilities station.

4. Perfect design of vacuum system, such as the heating method of vacuum vapor phase pipeline and jet pump, by use of HTM pump, to strengthen the heating and heat preservation effect for key users, to

avoid vapor phase pipeline blockage. In addition, reducing the use of power steam has obvious effect on saving heat energy.

5. The equipment layout of the whole plant is reasonable, considering the production practice and aesthetics comprehensively, accepting the opinions of customers modestly, and getting close to the real needs of customers, the quality is our first consideration.

What does this mean for new materials?

In the 21st century, countries have put forward higher requirements for environmental protection, synthetic resin has become the third most important material after metal and cement, and plastic waste has become an important source of white pollution.

Convenient, non-toxic, inexpensive and aesthetically pleasing plastics have become the preferred choice. Biodegradable materials and their derivatives have become the focus and direction of research on biodegradable materials.

1. PBAT (polyglycol terephthalate) is a copolymer product with good film properties developed on the basis of PBS (polybutylene glycol succinate).

The product has excellent flexibility and biodegradability. It can be used in injection molding, extrusion, blow molding and other processing methods. It can be widely used in sheet, packaging, plastic film, foaming, adhesive and other places.

2. PPT (Poly Trimethylene Terephthalate) fiber has good usability and processability. Compare with PET, PBT and Spandex, PTT is high in elasticity, good in continuous printing and dyeing ability, uvioresistant, internal stress resistance, low water absorption and static, good in biodegradability and cyclic utilization, etc.

It is widely used in carpet industry, clothing material, engineering plastic and many other fields. With the breakthrough of 1,3 propanediol (PDO) technology in China, PTT fiber will be one of the hot new fiber materials in the future.”

What is the situation for the filament and staple fiber spinning mill technologies? Any news?

In the spinning mill itself, we offer our globally established spinning plant systems with energy-efficient technology solutions such as EvoQuench and WINGS. Technologies that are now used by almost all market participants worldwide. A success story for us and all involved. With regard to texturing, I would like to mention again the new eAFK EVO introduced last year at the ITMA Barcelona and highlight the three technologies EvoCooler, EvoHeater and EvoTake-up. This new generation of automatic texturing machines offers high flexibility in the configuration of the core components. It achieves 20 percent higher production speeds with 25 percent less energy consumption. We can demonstrate extremely high doffing efficiency and produce excellent yarn quality on the eAFK Evo.



We are similarly innovative in staple fiber spinning. Whether cotton-type or fibers for technical applications – we have the right solution for every material with production capacities of up to 300 tons per day. With Oerlikon Neumag we just recently successfully commissioned three staple fiber bicomponent systems here in China. With capacities of 50 tons per day each, the systems are being used to manufacture coreshath bicomponent fibers made from PP/PE or PET/PE at two long-standing Oerlikon Manmade Fibers customers. These fibers are used to make hygiene products.

Can you tell us something about Oerlikon's recycling and green technologies activities, please?

Of course. Recycling is on everyone's lips these days. But the way to a functioning recycling economy, nationally or even internationally, is still very long. However, the efforts everywhere are great. Ours is no exception. That is why I am confident that we can all make it together. Step by step. For the textile industry, there are numerous challenges just for the top topic "recycling" alone: competing markets and technologies, political framework conditions, the collection, separation and sorting of the used but still very valuable raw materials, and last but not least the question of a new, sustainable textile design. This is an area where the industry must reach a consensus.

Mechanical recycling from bottle to bottle, bottle to textile, but also from textile to textile is already feasible today. In the field of chemical recycling the last step is still missing – and textile to textile is simply the supreme discipline. Today, Oerlikon Manmade Fibers acts as gateway to polymer

process chains with a key position in promoting sustainable solutions.

Our current Oerlikon machinery are producing yarns based on fossil-based resources. We are offering sustainable technology solutions potentially substituting current polycondensation technology. The processability and spinnability of recycled polymers on Oerlikon Manmade Fibers machinery has to be assured.

In the near future we at Oerlikon Manmade Fiber are assuring to be a front runner in the development of sustainable technologies. We will focus on the development of green technologies, such as recycling or biopolymer processing as we see a good opportunity to generate revenues as innovator in newly developing markets.

I wish you all and all market participants one thing above all: health. We hope that the economic situation will recover quickly for all concerned and that we all can look forward together to a positive future for the manmade fiber industry.

Thank you, Mr. Stausberg.
Stay healthy! » (aw)



Attractive technology solutions for growth markets

Factory know-how from a single source

From Melt to Yarn, Fibers and Nonwovens. From the polycondensation and the processing of PTA and MEG as well as the extrusion of, for example, recycled polyester chips all the way through to hundreds of thousands of packaged and stored or directly-delivered textured bobbins for a market within the textile industry worth billions. From the planning and construction of highly-complex production plants to the engineering of large-scale plant projects and competent customer services.

This business model runs like a red thread through the self-conception of the Manmade Fibers segment of the Swiss Oerlikon Group. The right partner, especially – but not exclusively – for newcomers to the textile industry. Because – at Oerlikon – they get everything they need for a successful business from a single source.



The manmade fiber market is in a continuous process of change and currently shows clear characteristics of other comparable volume markets. “On the one hand, we are seeing a trend towards consolidation of market participants, especially in Asia, and – on the other hand – we are again and again seeing niche suppliers with special products, not least in the area of recycling materials” explains André Wissenberg, Head of Marketing, Corporate Communications and Public Affairs at the Oerlikon Manmade Fibers segment.

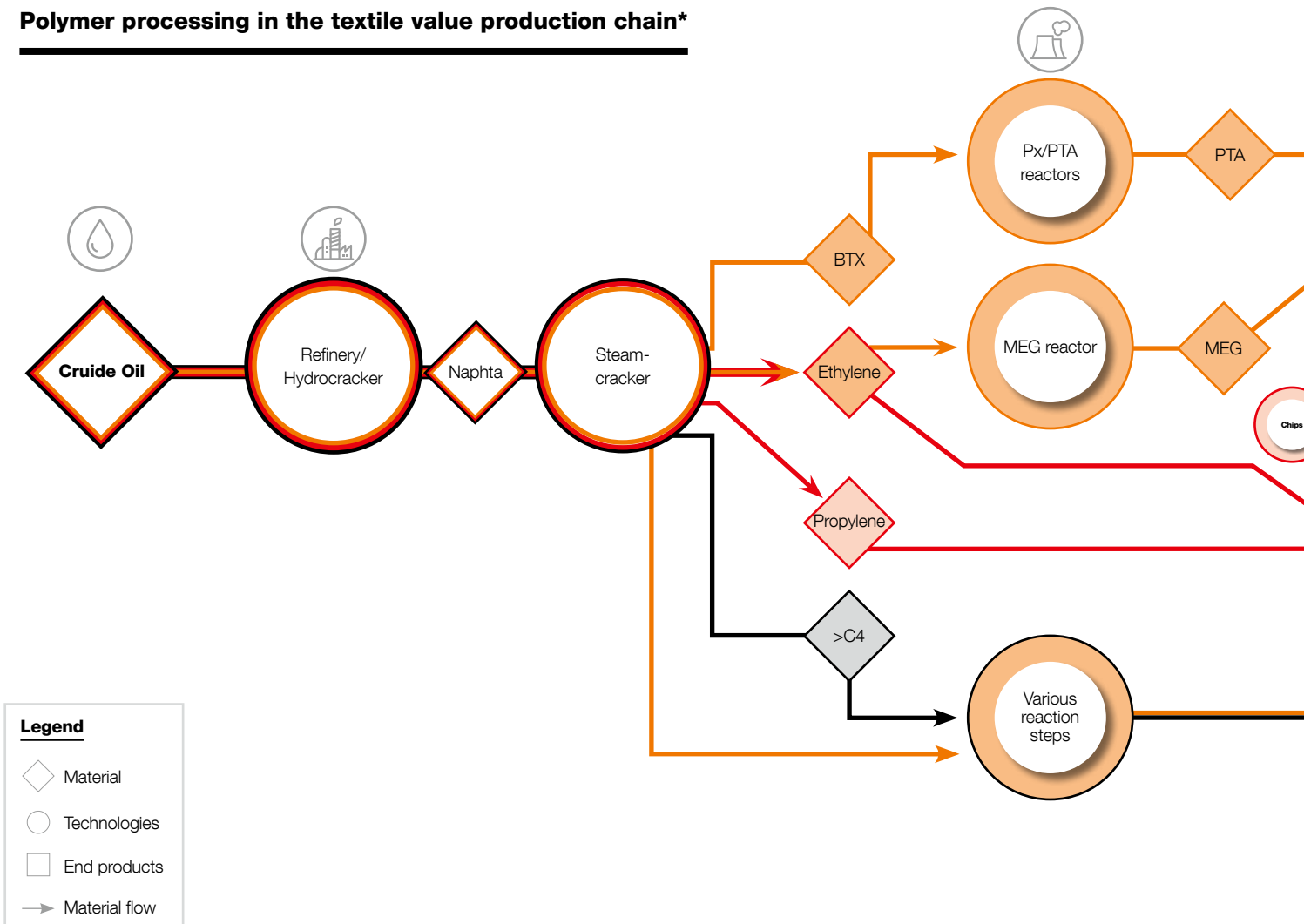
Good opportunities for long-term growth

In addition to this, new market participants are entering the manmade fiber market. On the one hand, these are oil producers looking for a way to refine their basic product oil and thus increase its value. Hardly surprising, considering the classic sales markets for oil in the automotive and aircraft industries are shrinking. E-mobility is becoming a competitor here. “In the textile industry – especially in the area of high-volume polyester production – however, we continue to see great opportunities for long-term growth

due to the ongoing population increase and the associated sales of attractive products”, comments Wissenberg.

Other potential entrants into the world of manmade fiber production are ‘old acquaintances’: cotton spinners, who recognize that growth in the natural fiber sector is nearing its end, and has perhaps already reached it. “Cotton spinners today have to face major challenges, because the issue of sustainability is increasingly becoming a focus in all societies. The immense water consumption in cotton production

Polymer processing in the textile value production chain*



*Graphic shows important process and material flows in the production of manmade fibers; alternatives are also possible

is an obvious point of criticism. In addition to this, agricultural land increasingly needs to also be used to produce food. Thus, the production efficiency of cotton on ever-shrinking farmland must be clearly increased, not least also by growing genetically modified cotton, which leads again to criticism and resistance from consumers”, explains Wissenberg.

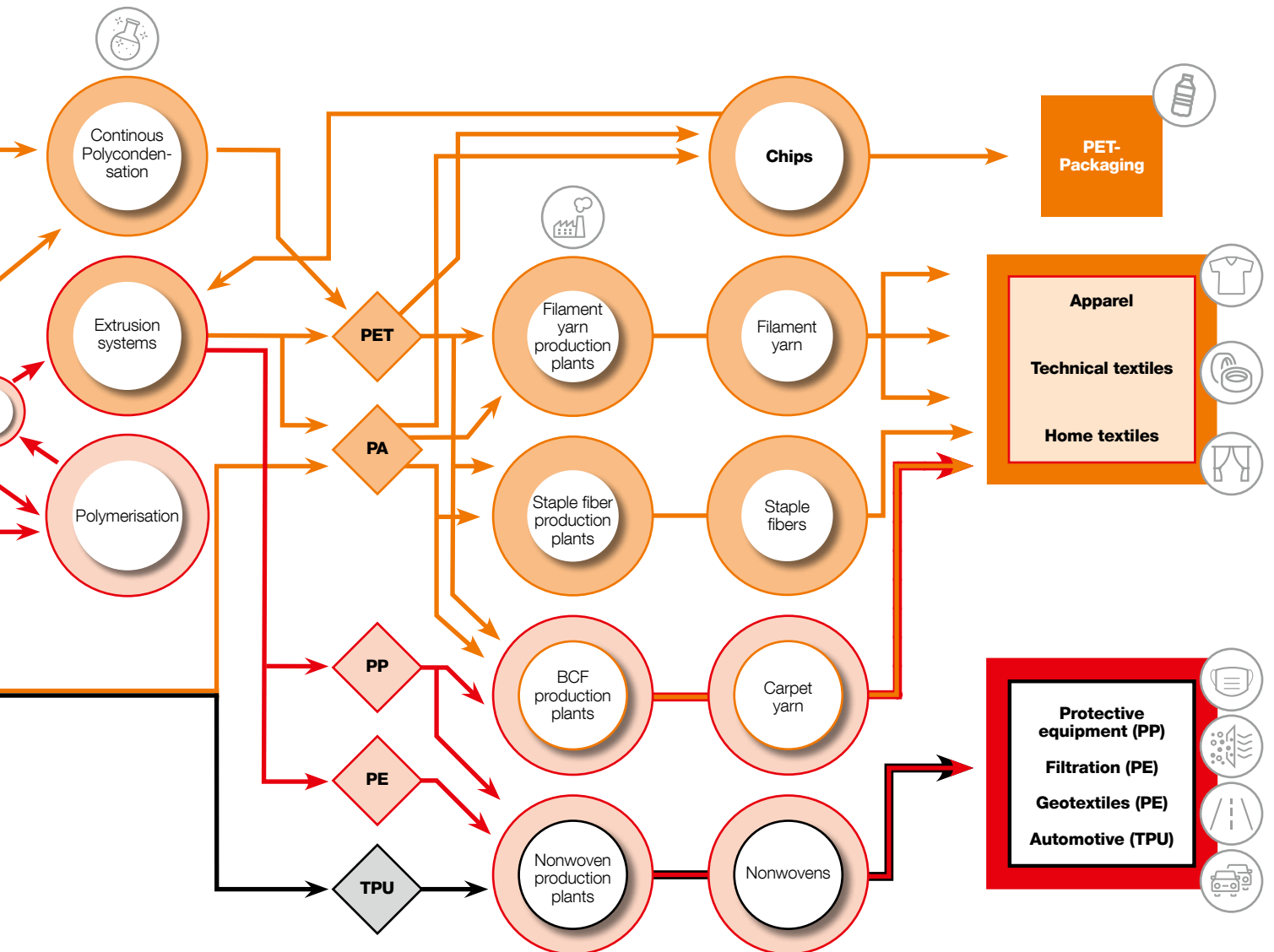
Competence for over 35 million tons of manmade fibers per year

Especially for newcomers to the manmade fiber business, it is impor-

tant to have competent and experienced partners. Oerlikon Manmade Fibers was the first total solutions provider in the market to acquire the know-how to offer a complete factory from a single source. This commitment and expertise are based on decades of experience in large-scale spinning plant projects and comprehensive know-how in manmade fiber production.

With roots dating back to the year 1922 and intensive research and development activities, Oerlikon is the only company in the world with its own technologies and process

know-how along the entire textile value chain – From Melt to Yarn, Fibers and Nonwovens. As one of the leading companies in the world that has always specialized in technologies for POY, DTY, FDY, BCF carpet yarn and polyester staple fibers (PSF), it also has, in addition to its traditional activities in spinning fibers and yarn, extensive expertise in melt production – whether for plant solutions for the continuous polycondensation (CP) for the production of fiber grade and bottle grade polyester melt and granulates – or in extrusion, e.g. for recycled polyester chips.



The extensive range of customer solutions is also reflected in market figures: Oerlikon Manmade Fibers' technical solutions produce more than 35 million tons of manmade fibers per year. Over 20 of the 25 leading PET manufacturers, representing almost half of the global capacity in this market, are customers of the Oerlikon Manmade Fibers segment.

Comprehensive range of solutions with leading-edge technologies

"These successes would probably never have come about if our customers had not repeatedly benefited from our wide range of technology solutions", explains CTO Jochen Adler. He adds that the market has meanwhile opened very positively to the 'From Melt to Yarn, Fibers and Nonwovens' concept and to offering manufacturing processes from a single source. "Many of our customers are becoming increasingly interested in our all-inclusive range of solutions with leading-edge technologies, and the economic benefits of this are definitely being recognized", says the CTO, who has been in charge at the Oerlikon Manmade Fibers segment since 2017. "We can see a clear trend here, for example in China. There, companies are joining forces and setting up research and development pools or investing in new smart factories. Many want to be more independent of material procurement and integrate a CP plant. This is more economical in the long-term and ensures success in a volume business", Adler continues.

The advantages are obvious: with the integration of the upstream process stage, the yarn producer gains complete control over the entire yarn production processes and develops advantages such as direct influence on the quality of the raw material, optimum mutual coordination of the individual production steps and plant components, independence from the imponderables of the granulates market, and the fact of achieving additional value creation, including increased profit margins.

Practiced view of the whole

"With our decades of experience and the knowledge of hundreds of engineers along the entire process chain and across a wide range of applications, we at Oerlikon can design all machines from melt to yarn for maximum flexibility in the production and processing of a wide variety of products and adapt them to changing material requirements, coordinate them with each other and thus develop customized solutions for individual customer projects", explains Adler. This is also significant and advantageous with regard to all interfaces between systems and machines up to the end products.

This practiced view for the whole promotes technological solutions with economic and ecological advantages (e-save philosophy), not only with regard to individual machines, but also to the entire plant. In this way, the company optimizes all necessary utilities for the operation of the entire factory. Energy management is considered and designed across the whole production process and waste heat energy is used for other processes and machines within the plant. Oerlikon is also able to supply a plant with virtually all media, from raw water and waste water to media such as nitrogen.

Avoid frictional losses

Oerlikon's know-how is meeting the needs of a growing number of e.g. polyester producers who are increasingly focusing on their core business and therefore do not want to carry out the engineering for plants themselves. "Our engineering competence provides many advantages, starting with shorter project planning times, greater planning reliability and smooth, on-schedule completion", assures Michael Maechtig, responsible for product management for so-called 'factory projects'.

Ultimately, Oerlikon's customers save themselves many individual inquiries for the commissioning of different trades, they barely need their own personnel and engineering know-how for project handling. "When involving many different service providers who are not well attuned to each other, there can be great frictional losses", explains Achim Debener, who has successfully managed such complex projects for many years. If everything comes from a single source, project implementation is more pleasant for the customers – and the ROI (return on investment) is also faster. The Oerlikon Manmade Fibers project management team has decades of experience in this area.

Global customer services

"Last but not least, our customers with such comprehensive plant solutions also benefit from the global presence of Oerlikon Manmade Fibers with its own locations in almost every textile center on the planet and a network of agents and service stations operating in more than 120 countries. Especially in the age of coronavirus, with often far-reaching travel restrictions, this gives us better and faster options for action with local personnel, who can partially eliminate the need to travel across national borders and support customers locally", elaborates Wolfgang Ernst, Head of Customer Services and Services Sales.

Smart Factory – the supreme discipline

Nowadays, anyone thinking of building a complete factory can no longer avoid integrated automation and digitalization solutions. Here too, Oerlikon has already proven that the Manmade Fibers segment can offer attractive solutions. “For our current smart factories projects for various yarn manufacturers worldwide, we have implemented digitalized systems for 100% product tracking over the entire polymer process chain – from the spinning plant to the finished, tested and packaged bobbins”, explains Jochen Adler proudly. The fully-networked factories, which are due to go into operation shortly, will not only enable the digitalization and networking of production and quality processes, but also the entire plant management based on an innovative IT infrastructure and provide a complete overview of the ongoing production as well as its costs at all times. The concept also includes digital service solutions such as remote support.

This also underlines Oerlikon’s claim to currently being the world’s only supplier of automation and digitalization solutions with corresponding processes from a single source. “We not only have, or are developing, these technologies; we also know exactly what data we need to collect and how to create automated analyses. This is part of our new DNA”, says the CTO, who knows something that is even more important: the competitive advantage that ultimately counts most is knowledge of the entire textile value chain – From Melt to Yarn, Fibers and Nonwovens. » (tho)



VDMA experts name digitization as key element for future success

Digital solutions on the rise

Just how important it is to address the issues of digitization and automation in large-scale plant construction and to be able to offer attractive solutions here is also confirmed by two experts from the VDMA.

“ The status of digitization in international large-scale plant engineering and construction, and the market requirements in 2025 were the focal points of a cooperation of the VDMA's Large Industrial Plant Manufacturers' Group and the auditing and consulting firm PwC. One key finding of their joint study: the market share of digital, data-controlled services will have tripled by then and will change business models. The study identifies specific capabilities to enable large-scale plant construction companies to fully exploit the market potential in 2025. These include, for example, knowledge of change management, mastery of agile methods in project management, the promotion of a founder mentality and the development of intelligent logistics concepts that can be used to optimize construction site processes in particular.

Against the background of radical technological upheavals and rapidly changing customer requirements, it is important that companies continue to consistently drive forward their digital transformation. Transparency of processes and close cooperation with partners within the value chain, for example within the framework of integrated platforms, are becoming key success factors. As a network-oriented association, the VDMA already offers many formats – such as the Engineering Summit – which provide scope for dialogue with partners from the value chain.”



Thomas Waldmann, Managing Director VDMA Large Industrial Plants Engineering Association, on the biggest challenges of internationally executed large-scale plant projects.

“ Artificial intelligence (AI) enables technical systems to do what was previously only possible for natural organisms: learning from experience. IT tools established on the market help to analyze machine and process data, recognize patterns and structures, and find the appropriate algorithms. The use of machine learning solutions is becoming increasingly interesting for mechanical engineering. These approaches are not only important with regard to the further development of existing products and services, but also with regard to the design of new business models, the optimization of own company processes and further automation in manufacturing.

High-quality data, which depict problems and errors that have occurred in the process, form the basis for every (AI) project. However, without the combination of the domain knowledge of the participants regarding material or process dependencies with the expertise in data evaluation and software implementation, AI-based solutions will not be successful in industry. Since the selected data is used to "train" algorithms, corresponding data must be collected and processed in a targeted manner. According to expert estimates, this requires about 60 to 80 percent of the time needed for such a project. To get started, it is useful to have manageable fields of application with good data availability and corresponding domain knowledge, so that the use of machine learning approaches can be practiced and faster successes can be achieved.”



Prof. Claus Oetter, VDMA Software and Digitization, on the role artificial intelligence (AI) will play in large-scale plant projects in the future, and the importance of data availability in this context.

Oerlikon Manmade Fibers goes digital

Less waste with the Smart Factory

A typical manmade fiber system produces well over 600 tons of yarn a day. This equals in around 700 winders in filament yarn production or 3 systems in staple fiber production. These figures show just how important smooth production processes are.

If an error creeps into the process at any point, the daily waste increases dramatically. It is obvious that all yarn manufacturers want to prevent this happening to ensure their production facilities operate efficiently. Here, digitalization provides invaluable support. A Smart Factory that networks all steps within the production chain – including all auxiliary processes – identifies and reports quality deviations at an early stage. Yarn manufacturers can quickly intervene in the production process and hence avoid generating waste.

And the Smart Factory is also the focus of Oerlikon Manmade Fibers. Here, it comprises considerably more than the Plant Operation Center, a system that has been well-established within the market for many years now. “This is about absolute transparency and traceability. At the end of the process, yarn manufacturers are able to track at which position its finished textured yarn packages were spun and even have information on the processed granulate and the specific production conditions”, comments Ivan Gallo, responsible for digital products at Oerlikon

“At the end of the process, yarn manufacturers are able to track at which position its finished textured yarn packages were spun and even have information on the processed granulate and the specific production conditions”

Ivan Gallo, Productmanager Digital
Oerlikon Manmade Fibers

Manmade Fiber. In this way, the Smart Factory ensures process reliability, above all. The data are automatically entered into the system and the product assessed at each stage of yarn production at which values and data are recorded – such as during visual inspection and when weighing. In the event of anomalies in the intermediate laboratory and quality checks, this

allows yarn producers to intervene in the production process and correct these anomalies. Information on the chip feeding, on the drying and on the masterbatch are available, as are data on the climate control, on the compressed air supply and on further auxiliary systems. With this, yarn manufacturers have at all times a complete overview of the ongoing production process, including comprehensive information on quality and production costs.

As a total solution provider, the Manmade Fibers segment of the Oerlikon Group rounds off its Smart Factory concept with the associated services: Operation, updates, further development of the software and services are part of the scope of services. » (bey)

“Digitalization has long been part of our everyday lives. Here, COVID-19 has merely acted as an accelerator. Particularly over the last few months, we have tried out so many things, learned a lot from our mistakes and have taken a giant step forward. The intelligent factory is no longer a vision, it has long become reality. Digital solutions have become fixed elements of our products and services – and everything is inextricably linked. But we have not reached the end of this exciting development by a long way yet: new technologies and solutions require new methods and new knowledge. In other words, we have to remain ‘agile’, constantly adapting to the changing situations and tasks at hand.”



Jochen Adler,
CTO Manmade Fibers
segment

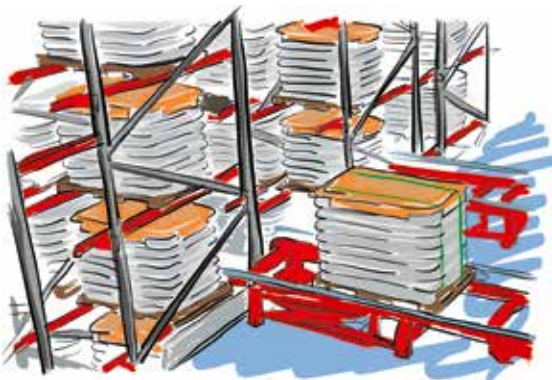
Highly sophisticated robotized handling, packing, transportation and warehouse systems for the chemical fiber industry – the range of automation products supplies perfectly integrated production and logistic solutions.

Automation solutions for an efficient yarn production



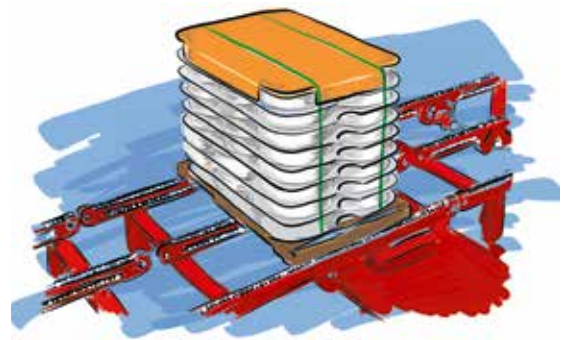
Wiping robot for spinpacks

The wiping robot guarantees outstanding yarn quality with a high degree of efficiency and optimized systems management. As a result, yarn manufacturers can minimize costs and maximize profits.



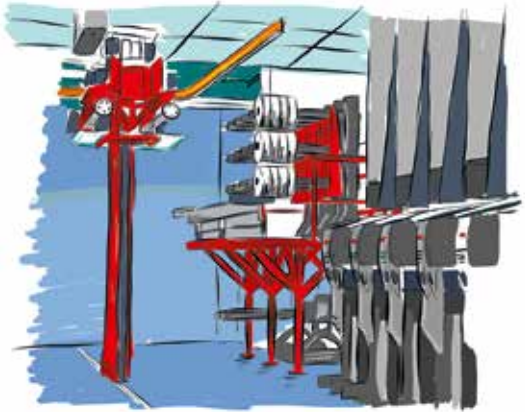
High bay storage systems

In order to simplify warehousing and to integrate the storage management into the automatic product flow the delivery range is completed by fully automatic high bay storage systems including all functionality for commissioning, route planning and truck loading.



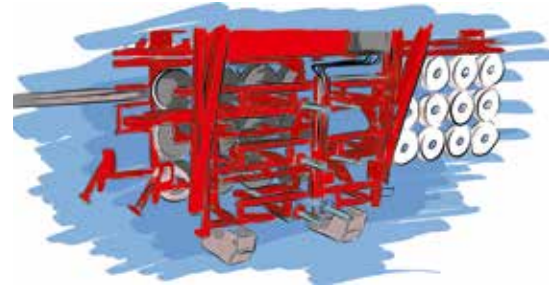
Pallet finishing

The pre-packaged/built pallet is ready for dispatch in the end line i.e. closed, weighed, labeled and finally supplied to the commissioning via a delivery buffer.



Doffing systems for spinning machines

Since the doffing system is directly connected to the production machines, its design must perfectly adapt to the operating surrounding conditions.



Transport

The step after doffing is the transportation of the bobbins to the intermediate storage or in some applications directly to the packing system.



Automatic packing

The packing line is typically the next step of an automatic filament handling system. Here the highest degree of customization is required.



Doffing systems for texturing machines

Floor based AGV (Automated Guided Vehicle) systems use state-of-the-art laser navigation. Thus these units do not require any mechanical rails or guiding, which would interfere with the remaining manual work in this area.

Oerlikon's global Service Network combined with digital solutions

Hybrid customer service the present and the future

In order to continue providing the best-possible customer service throughout the manmade fiber industry during the coronavirus pandemic, the Manmade Fibers segment of the Oerlikon Group has comprehensively adapted its offerings to the requirements of all its customers across the globe. In doing so, it has developed – both for the present and for the future – a practicable, sustainable and attractive solution: hybrid customer service.

Managers from Germany were involved by means of videoconferencing, for example. "A particular challenge for all parties – but well-mastered by our team together with our customers in accordance with the circumstances", explains Wolfgang Ernst, Head of Customer Services and Service Sales at Oerlikon Manmade Fibers.

Additional temporary staff on site

"Our local representatives provide support in those countries without their own Oerlikon Service Station", adds Ernst. Collaboration during these weeks and months has been even more important and has been going extremely well. And the locations in Germany have been providing Oerlikon Manmade Fibers online training seminars and intensive customer care using Microsoft Teams and Skype. "Currently, we are recruiting additional local temporary staff on site from our extended Service Network, training them – extensively online as well – and then bringing them together with local Oerlikon employees at the construction sites", explains Wolfgang Ernst. To this end, 'Start-up Services' would continue to be complemented by 'Service Lifecycle Management' services such as upgrades, modernizations, maintenance, servicing and repairs.

The range of customer services for the machines and systems of the Oerlikon Barmag, Oerlikon Neumag and Oerlikon Nonwoven competence brands is broad and covers all customer requirements throughout the world. The 'Start-up Services', such as assembly and commissioning for the products that are continuing to be delivered during the coronavirus pandemic, are presently the greatest challenge. However, Oerlikon has excellent local service set-ups in its core markets of China, India, the USA and Turkey. Customers in Europe are looked after by staff at the German sites. As a result, virtually all projects have been successfully carried out over the past few months despite the difficulties. This was the case above all in China. Due to the travel restrictions relating to China, experienced construction site man-



Oerlikon's local Service Stations are also attending to customers during the coronavirus pandemic.

ervice - e future

'You have to be able to roll up your sleeves and touch the machines'

To the extent it is possible, Oerlikon is currently providing 'Technical Services' and 'Advanced Services' – where it is actually necessary to be present at the system with experts – using videoconferencing. "Here, there are of course limitations. You have to see, listen to and feel a machine. You often have to roll up your sleeves and touch the machines to make improvements and increase efficiency", states the German engineer. However, customers are currently only rarely requesting so-called 'performance checks'. Local concerns have, understandably, shifted elsewhere. But Oerlikon can carry out analyses and optimizations of the processes, hardware and software to a certain extent by means of remote access. Even before the coronavirus pandemic, the majority of the Manmade Fibers segment's customer services were being provided – in collaboration with customers – in a digital, hybrid form. "Because, generally, we additionally deploy experienced engineers and technologists from the international Oerlikon network on site in order to provide the necessary services for all customers directly", continues Ernst.

Supply chain up and running

There currently continues to be a reliable supply of Oerlikon Barmag, Oerlikon Neumag and Oerlikon Nonwoven original parts. "At the start of the coronavirus pandemic, the supply chain was stable – and it continues to be so. The logistics with all our partners across the globe are running smoothly", comments the experienced Service Manager. Of course, Oerlikon's customers can also place orders online using the 'myoerlikon.com' e-commerce shop. Items are then swiftly dispatched depending on the availability at our worldwide warehouses. » (aw)

The Oerlikon Manmade Fibers segment experts can also be virtually 'on site' during the coronavirus pandemic by means of remote access.



Online consultation and training are currently the order of the day.



Global network for global customers

Facing the pandemic together

Coronavirus has a firm hold on all of us. The close and personal contact to the customers so important to us has become considerably more difficult. How do the members of our sales staff nonetheless look after their projects well and intensively from home and within the markets? We asked our market experts how they are supporting our customers in the daily challenges they face in an age characterized by restricted travel possibilities.



Chip Hartzog and Michael Rübenhagen look after our clients in the US.

USA / Middle- and South America

"We have transitioned our efforts to remain connected with customers in a virtual way. Very quickly after our in-person visits to customers in early March, we transitioned into scheduling via Zoom & GoToMeeting, and also polished our Skype and TEAMS skills in order to communicate effectively. It has been a tremendous advantage to have Service and Support staff in the USA, which helped during pending machine start-ups and allowed support with emergency and essential visits to keep our customer's machines up and running. We have also recognized some limitations in virtual networking – for instance management changes at key customers have only been introduced virtually – therefore, we eagerly anticipate some kind of face-to-face visitation in the coming months!"



Chip Hartzog



Michael Rübenhagen

Turkey

“Currently, we are conducting many customer discussions by means of videoconferencing. If this proves to be difficult, we remain in contact by telephone and e-mail. Both our business partners and we have swiftly adapted to the new challenges. Orders, training sessions and design meetings are all being successfully negotiated without the need to be present on site and to the complete satisfaction of all involved. The personal customer care provided on the ground has been assumed by our local service partner Bilge and our representative Tekstil Servis. However, we are – despite the benefits of modern technology – already looking forward to when we will be able to personally meet up with our business partners again.”



Oliver Lemke



Arnd Luppold



Hakan Gürdal

Oliver Lemke, Arnd Luppold and Hakan Gürdal look after clients in Turkey.



Jilali Lakraa and Aly Nagy look after clients in the Middle East.

Middle-East / Africa

“COVID-19 has not only changed our everyday lives, it has also impacted on the way we communicate. We use considerably more digital methods for keeping in touch with our clientèle. In Customer Service, we have switched to remote service solutions; pleasingly, we are well-equipped for this. Our local Sales and Service teams are a huge help when it comes to providing our customers with all-round support. For the Middle East, we want to further strengthen local service provision.”



Jilali Lakraa



Aly Nagy



ARCTIC

India / Bangladesh

“Firstly, we appreciate that we are fortunate that both our customers and we at Oerlikon Manmade Fibers have to date not been excessively impacted by the coronavirus pandemic. Despite the tricky circumstances, we have been able to maintain our operations, continue to look after customer projects and to sign new order contracts. Here, it is the close collaboration with our clients that has, of course, helped us enormously. The basis of trust created in this way has been helping us in this special situation. We are learning new methods of communication, adapting our methods of working to the changed circumstances. Some of the experiences we have had will accompany us into the future and permanently change our methods of working.”



Jürgen Vogel



Atul Vaidya

Jürgen Vogel and Atul Vaidya look after our customers in India.

North-East Asia / Vietnam

“Local anchors in the markets are absolutely essential, especially in times of travel restrictions on account of the coronavirus pandemic. Thanks to the successful curtailment of two waves of infection in Vietnam, our local representatives and our customers have been able to remain in personal contact with each other. The digital sales work has helped make project discussions more efficient, but above all also bridge geographic distances. What we have, however, learned during what has proven to be a fairly digital 2020 is that sales work is extensively based on a trusting relationship with the decision-makers at our customers. And a trusting, reliable relationship is built on personal contact.”



André Steingass



Christoph Peters

André Steingass and Christoph Peters look after customers in Vietnam.

SOUTHERN

China

“Selling is team work and our excellent collaboration, based on mutual understanding and trust, has produced high-quality results. A continual exchange of information and best practices is necessary in order to align both sides. Listening, understanding, providing mutual feedback and then acting form the basis for success. Digital sales work does not replace personal relationships, which continue to be important in a business environment with investments in the millions of euros. However, digital tools help us to see, feel and hear personal reactions in meetings, discussions and negotiations and to correspondingly respond to these.”



Felix Chau



Jens Schumacher



Stefan Schäfer

Felix Chau, Jens Schumacher and Stefan Schäfer look after the Chinese market.

NORTH
PACIFIC
OCEAN

South-East Asia / Indonesia

“Social distancing, face coverings, working from home, quarantine, lockdown and travel restrictions – just small selection of the words frequently used of late. The coronavirus pandemic has changed business culture completely. The economy has experienced a huge dip as a result of the crisis. For these reasons, we are mobilizing all our strengths to nevertheless provide our customers with efficient and customized support. We are glad we are able to use all options offered by digital methods, even though these naturally do not replace personal contact.”



Michael Röllke



Ralf Link



Andrew Liebig

Michael Röllke, Ralf Link and Andrew Liebig look after customers in Indonesia.

INDIAN
OCEAN

OCEAN

Sustainability: VacuFil recycles post-consumer and post-production

From waste to value

Whether as beverage bottles, film packaging, high-tech sports shirts or safety belts – polyester is omnipresent in our everyday lives. And the recycling of this multi-talented material has long been more than just a trend. VacuFil promises to fulfill the vision of superlative sustainability: a solution for a virtually waste-free polyester spinning process. In an interview with 'Fibers & Filaments', the developers – Oerlikon Barmag and BB Engineering – reveal just how this clean technology is being received by the market and how flexible it processes waste into first-class granulate or utilizes it directly for the manufacturing process.



Dr. Schäfer, Oerlikon Barmag unveiled the VacuFil technology at the ITMA Barcelona in 2019. How has the market reacted?

Dr. Klaus Schäfer: The interest among manmade fiber manufacturers across the globe is huge. Our pilot system in Remscheid has already been used for numerous customer trials. The most diverse waste materials have been processed into 100-percent rPET granulate, which has then been successfully spun into POY and FDY yarns. We now have reliable results with which to tap into this market.

How do you manage to turn probably quite disparate types of polyester waste into a high-end recycled product?

Dr. Klaus Schäfer: Here, our decades of competence help tremendously. What Oerlikon Barmag brings to the table as a technological leader in the field of filament yarn spinning systems, BB Engineering (BBE) complements with considerable know-how in the area of extrusion and filtration and in systems construction and engineering. Our joint venture, established back in 1997, has produced some flexible, high-performance recycling solu-

tions, such as the VarioFil R spinning system, launched in 2014 and which processes rPET flakes and chips into fibers. With the VacuFil, we have now taken a further step and have bundled our know-how into a new, innovative core component: the Visco+ vacuum filter.

What role does it play within the system?

Matthias Schmitz: It unites gentle, large-area filtration and rapid build-up of the polyester's intrinsic viscosity (IV). The vacuum removes volatile contamination, ensures a controlled IV increase and ideal melt homogeneity, which is decisive for the downstream spinning performance. Manufacturers can reliably determine and set the suitable IV values using an integrated measurement unit in order to produce precisely the type of recycled polyester required for their application.

The vacuum filter and the degasification and finest filtration technology used with it are core BBE competencies and represent the major difference for the customer's spinning performance – bobbin after bobbin. The excellent degasification performance additionally relieves energy-intensive predrying.



Matthias Schmitz (left), Product Manager for Recycling Systems at BB Engineering
Dr. Klaus Schäfer, Managing Director of BB Engineering.

n polyester waste



And what types of waste can be processed?

Matthias Schmitz: The modular structure of the VacuFil range opens up numerous possibilities for processing waste materials. Bottle flakes, agglomerated fiber waste or a mix of both can be used. Here, producers can now not only feed demanding additives into the melt, they can also effortlessly adjust the rPET ratio from between 5 and 50 percent in the main melt flow in order to fulfill legal requirements. Manufacturers can process first-class rPET granulate from all these materials or – as an inline variant – use upcycled products to feed downstream direct spinning positions. Depending on the requirement, our VacuFil systems can also be custom-configured, achieving throughputs of between 300 and 3,000 kilograms per hour in the process. And – incidentally – the entire production process is reliably controlled and monitored by Oerlikon Barmag's GUIDE system.

These all sound like very convincing arguments. Do you expect the market response to be correspondingly positive?

Dr. Schäfer: We are certain that our product will convince customers. Particularly in view of the fact that

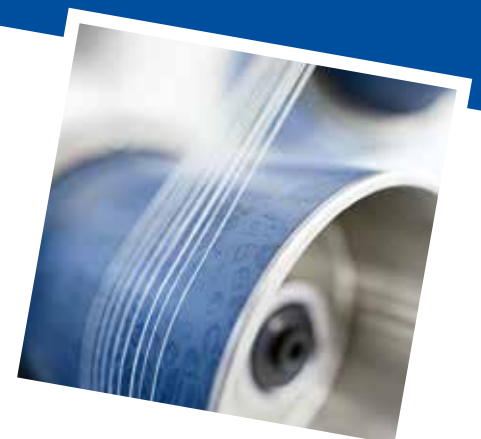
the market situation indicates it will. The growing demand for polyester and its various applications demands responsible handling of global resources. All textile producers are under pressure to find sustainable solutions for the future. Today, 'virgin polyester' made from crude oil is no longer the exclusive raw material deployed in manufacturing – recycled polyester from post-consumer and post-production waste is also used. The processing of such waste is also contributing towards lowering raw material, disposal and transport costs and hence towards increasing efficiency. And a further side effect is a considerable reduction in CO₂ emissions. And these arguments are also increasingly convincing customers.

Are there any headwinds in the age of coronavirus?

Matthias Schmitz: As in the case of all other business challenges, we are trying find customer-oriented solutions. BB Engineering offers digital videoconferencing, for example. With this, we are endeavoring to continue providing our worldwide customer base with access to this innovative technology. And this offer is being willingly accepted. » (tho)

About

BBE has been offering innovative machine and systems construction services for more than 20 years. Its portfolio includes the development, construction and assembly of extrusion and filtration technologies as well as complete spinning and recycling machines for the plastics and textile industry. The services range from the construction and planning phases all the way through to the implementation of projects. Founded in 1997 as a joint venture between Oerlikon Barmag and the Brückner Group, the company today employs more than 160 members of staff at its Remscheid-Lennep site.



Protective equipment demands high-end nonwoven products

Tackling coronavirus with spunbond technologies

Since the outbreak of the coronavirus pandemic, the worldwide demand for protective masks and apparel has resulted in a record number of new orders in the high double-digit millions of euros at Oerlikon Nonwoven. The meltblown technology from Neumünster is recognized by the market as being one of the technically most efficient methods for producing highly-separating filter media made from plastic fibers.

The rising demand for protective masks and other medical protective equipment since the start of the coronavirus pandemic and the associated global ramping up of production capacities has also resulted in an increase in the demand for nonwovens for the production thereof. Initially, this resulted in bottlenecks in the provision of meltblown filter nonwovens. To this end, there had until this point been very few producers of medical filter nonwovens outside China. Meanwhile, the demand for spunbond systems is also rising. “Due to the structure of our group, we are in the fortunate position to swiftly reallocate and free up our production capacities. This means that we are able to relatively quickly deliver not only meltblown systems, but also spunbond equipment”, explains Dr. Ingo Mählmann, Head of Sales & Marketing at Oerlikon Nonwoven, talking about the positive situation at the company.

The capacities for respiratory masks available in Europe to date are predominantly manufactured on Oerlikon Nonwoven systems. “Our machines and systems for manufacturing manmade fiber and nonwovens solutions enjoy an outstanding reputation throughout the world. Ever more manufacturers in the most diverse countries are hoping to become independent of imports”, comments Dr. Mählmann. The Oerlikon Nonwoven meltblown systems are being delivered to Germany, China, Turkey, United Kingdom, South Korea, Italy, France, North America and – for the very first time – to Australia until well into 2021.

Quality and efficiency in demand

Depending on the purpose of the application, medical PPE (personal protection equipment) should be breathable and comfortable to wear, protect medical staff against viruses, bacteria and other harmful substances and form a barrier against liquids. For these reasons, they are often made of either pure spunbond or of spunbond-meltblown combinations. Here, the meltblown nonwoven core assumes the barrier or filter task, while the spunbond has to retain its shape, while being tear-resistant, abrasion-proof, absorbent, particularly flame-resistant and nevertheless extremely soft on the skin.



n meltblown and



Oerlikon Nonwoven is one of only a few European systems manufacturers able to offer both meltblown and spunbond systems. The systems are convincing with their combination of effectiveness and productivity, while simultaneously being highly-efficient. The homogeneous nonwoven formation ensures high-quality end products. “We offer our customers systems that are explicitly tailored to their requirements. We supply them with the total package – from the extrusion process all the way through to the nonwoven roll goods, all from a single source”, states Dr. Mählmann.

All masks are not created equal – thanks to the ecuTEC+

Protection against infections such as coronavirus can only be guaranteed with the right quality. On the one hand, this relates to how the masks are made. On the other hand, it is above all – as is so often the case – about what’s inside. Because the nonwoven used in protection classes FFP1 through FFP3 respiratory masks plays a decisive role.

The nonwovens can be electrostatically-charged in order to further improve the filter performance without additionally increasing breathing resistance. Here, Oerlikon Nonwoven's patented ecuTEC+ electro-charging unit excels in terms of its extreme flexibility. Nonwovens manufacturers can freely choose between numerous variation options and set the optimal charging method and intensity for their specific applications. In this way, even the smallest particles are still attracted and reliably separated by a relatively open-pored nonwoven. Nevertheless, mask wearers are still able to easily breathe in and out due to the comparatively loose formation of the fibers. To this end, it comes as no surprise that all meltblown systems currently destined for the production of mask nonwovens are equipped with the ecuTEC+ unit.

» (che)



An exclusive license from Procter & Gamble offers the best for non

First class wipes with F

Success is built by connecting the right people with the right product. In a global marketplace, this means collaboration is just as important as competition. Companies need to focus on their strengths, while finding practical ways to innovate and expand upon their capabilities.

In order to do so, working together often makes the most sense. This is what motivated Procter & Gamble and Oerlikon Nonwoven – Teknoweb Materials to agree on an exclusive license agreement to market and sell the Phantom platform worldwide.

The patented process for hybrid nonwovens combines the best of both airlaid and spunmelt technologies to deliver new, flexible ways of

The greater freedom for formulating continuous and discrete fibers allows for more flexible and absorbent structures and highly textured materials.

creating wet and dry wipes. Phantom technology offers additional benefits by reducing resources and cost, while increasing overall performance. The exclusive license gives Oerlikon Nonwoven – Teknoweb Materials total access to the patents, know-how, and pilot lines developed by Procter & Gamble. The research and development team at Procter & Gamble continues to support Oerlikon Nonwoven

– Teknoweb Materials distribute this technology worldwide. In addition, Oerlikon Nonwoven – Teknoweb Materials have further refined the process into their own Levra technology – an entry-level option which offers tailored production volumes with lower investment costs but is still suitable to be upgraded to the premium Phantom model in the future.

Quality products that cost less

Essentially, Phantom technology was developed to produce hybrid substrates. The spunmelt and airlaid processes are merged into one step to combine cellulose fibers, long fibers such as cotton, or even powders with polymer fibers in unprecedented ways. This technology has clear advantages in terms of resources, performance, and cost compared to the previous processes on the market. By removing hydroentanglement, it is no longer necessary to dry the material. Adjusting the process can optimize relevant product characteristics such as softness, strength, dirt absorption, and liquid absorption. In the end, this even increases the quality of the product itself.



Nonwovens

Phantom technology

The greater freedom for formulating continuous and discrete fibers allows for more flexible and absorbent structures and highly textured materials. Wipes feel softer to the touch while providing more protection for the hands. Up to 90% of the material can consist of pulp fibers, although natural alternatives like cotton or synthetic fibers can be added to the mix. Phantom technology has not only found a

practical application in a variety of wipes – such as hygiene wipes, anti-bacterial wipes, surgical wipes, or industrial wipes – but also in absorbent cores, for instance in diapers or fempro products. With so many applications, Oerlikon Nonwoven – Teknoweb Materials are fully prepared to deliver Procter & Gamble's innovative Phantom technology to the global nonwovens market. » (wca)



Large-scale pumps fulfill the highest standards as core components

Logistical perfection

They are the tireless 'Hidden Champions': Large-scale gear metering pumps reliably feed the melt for synthetic fibers through the system under precisely-controlled conditions. Day in, day out – often for decades. And Oerlikon Barmag has just as much experience in constructing these key elements – and is currently the world's only full-range supplier of all direct spinning plant pumps.

From the reactor to the spinning beam, polymerization and polycondensation systems include around 150 meters of pipes. The freshly-produced plastic melt flows along these pipes, navigating the turns within the system through to the individual spinning positions, where it is transformed into filaments. This journey demands logistical perfection, as the 'passenger' should arrive in tip-top shape if it is to be further processed into quality yarns. For this, the feed pressure, feed volume, temperature and viscosity of the melt have to remain within the defined parameters at all times.

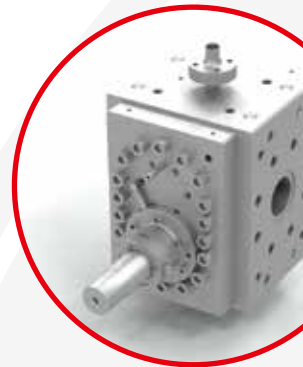
These demanding tasks are mastered by two large-scale pumps in direct spinning systems: the discharge pump draws the melt from the reactor using vacuum. The booster pump is installed around half-way along the melt pipe, compensating pressure losses occurring up to this point to ensure downstream consumers such as spinning pumps are able to optimally further process the melt. Here, the large-scale pumps supply numerous spinning positions simultaneously. If one of these key components fails, the

spinning plant practically comes to a standstill – with a corresponding loss of production.

For this reason, reliability, quality and precision are the decisive factors for success within the pump market. Oerlikon Barmag focused on this early: gear metering pumps from Remscheid have not only been deployed in the textile industry since 1922. On the basis of its decades of experience, the company is also the world's only supplier of the entire product range of all gear metering pumps for modern direct spinning systems – from large discharge and booster pumps with 330 kilogram gears all the way through to more filigree spinning and spin finish pumps with the smallest gears weighing just 1 gram. "Our single-source technology is perfectly harmonized, also with regards to the targeted project planning and the smooth operation of automated factories comprising the polycondensation system, the spinning plant through to the finished package", states Klaus Lorenz, Head of the Oerlikon Barmag Pump Division.

Discharge pump with 3D-printed element

Here, customers benefit from the latest metering and conveying technology, which is constantly being adapted to the process requirements and optimized. To this end, the interior and gear geometries of the discharge pumps are systematically designed for optimum conveying, filling and heating as well as for the lowest possible power consumption and melt temperature increase. One highlight is the self-developed, maintenance-free POLY-VAC seal, which – since recently – has been able to be equipped



ts in factory projects

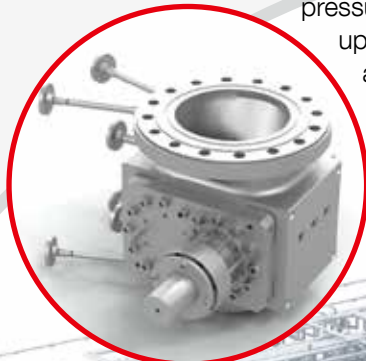
on over 150 meters

with a printed cooling ring for active temperature control. The element's additive production enables the utilization of a special material that contributes towards improving function and manufacture. A series of temperature sensors also allows users to determine the condition of the support points and the pump and all times. Oerlikon Barmag discharge pumps convey up to 12 liters of melt per revolution.

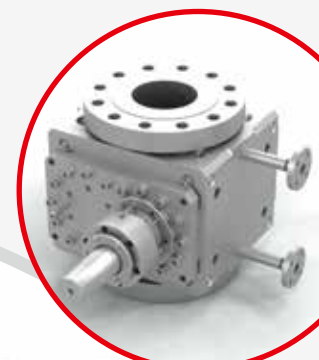
And the booster pump's vapor heating system has also been optimized. As a result of the more efficiently-designed construction and manufacturing, it now controls the temperature even more evenly.

These pumps generate pressure build-ups of up to 300 bar and also feature a maintenance-free sealing system.

What level of precision the pump technology offers is demonstrated by the spinning pumps, which are manufactured with micrometer precision. "They have to pump the exact same amount of material from each filament outlet of the spin pack, ensuring the filament weight remains absolutely constant", explains Klaus Lorenz. This extreme metering accuracy characterizes the entire system and is ultimately required by all pumps involved. Therefore, Oerlikon Barmag pumps achieve a volumetric degree of efficiency of more than 99 percent, a peak value within the market. "Our technology caters to the highest quality standards at all levels – from the raw material through to manufacturing", he states, reassuringly. It is for this reason that Oerlikon Barmag large-scale pumps have been operating for 20 years and longer in many cases. » (tho)



Discharge pump

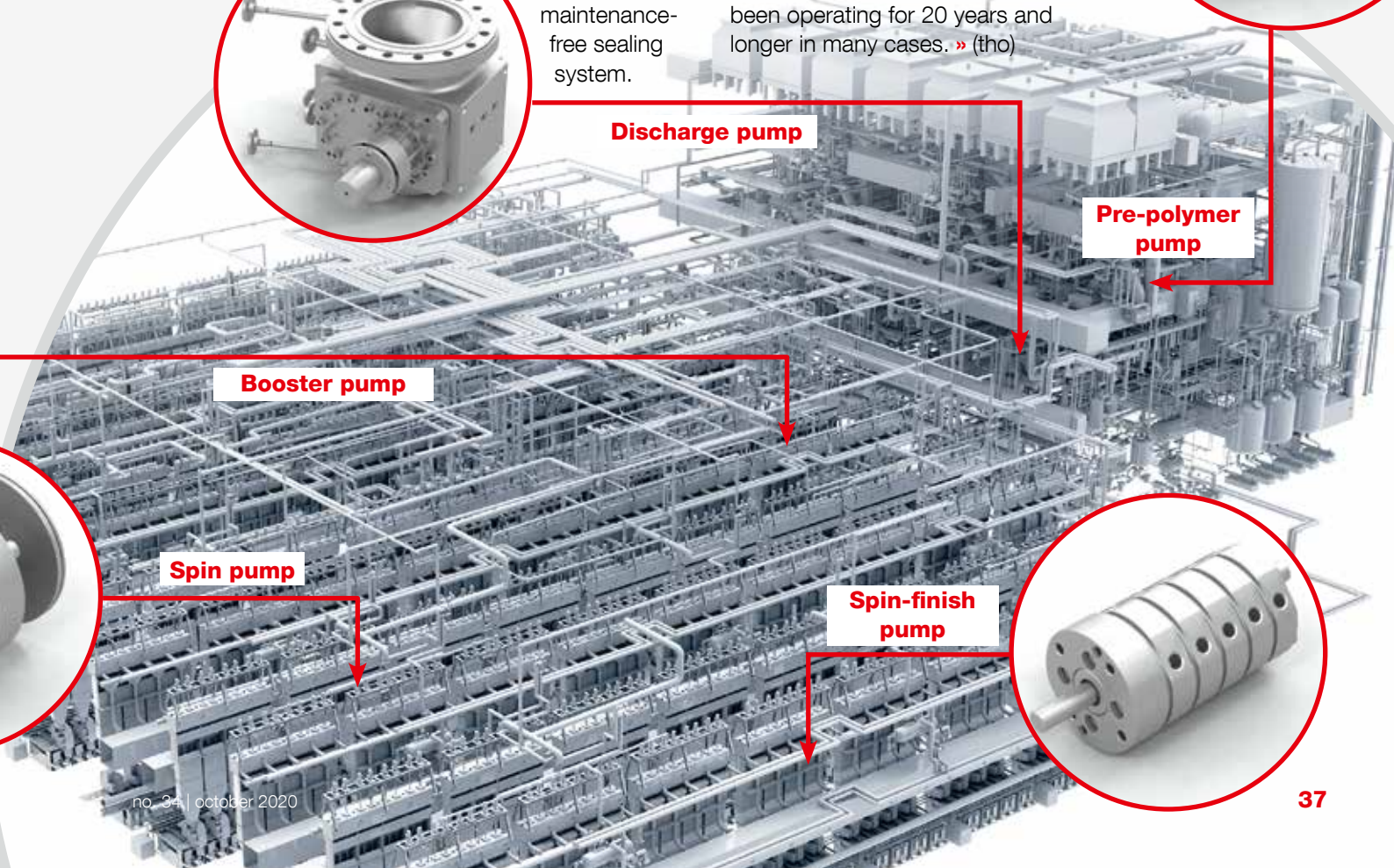
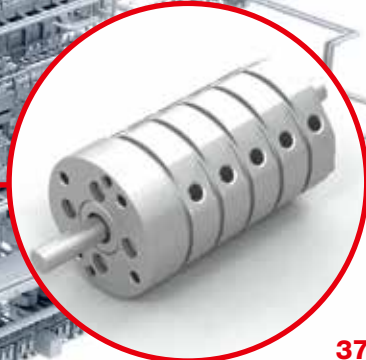


Pre-polymer pump

Booster pump

Spin pump

Spin-finish pump



Nobody has a crystal ball, but a positive view into the future is allowed

Where to go, textile industry

Fibers & Filaments asked the top managers of the renowned associations ITMF, CIRFS and CCFA where the textile industry is heading. The statements give hope to overcome the Corona crisis also economically.

ITMF, International Textile Manufacturers Federation Dr. Christian Schindler, Director General

“The COVID-19 pandemic caused unprecedented supply and demand shocks around the world. While the supply shock hit the industry first, the demand shock had a much stronger impact that will be felt much longer. The 4th ITMF Corona-Survey which was published in the middle of June had revealed that turnover in 2020 is expected to be around 30% lower on average than in 2019. All segments – from fiber to garment producers – were hit in a similar way.

Nevertheless, it is important to note that depending on the specific products offered and the respective brands/retailers with their distributions channels

companies could weather the storm very differently. For example, home textile products, bike equipment or comfortable lounge wear sold very well online and offline in the past six months. Other products like formal wear or standard garments like jeans or shirts did not. The 4th ITMF Corona-Survey showed that around 25% of textile manufacturers expect quarterly turnover to reach pre-crisis level already second half of 2020, around 45% in the first two quarters of 2021 and another 30% after the middle of next year.

As for the supply chain, the pandemic has accelerated trends that

were already set in motion. Environmental concerns, cost considerations, speed to market, trade or political conflicts have already led brands and manufacturers to consider adapting their sourcing and producing strategies, respectively. While China will remain a large producer of textiles and garments, its share in global exports is likely to continue to shrink. Other countries in Asia but also in the other regions of the world are likely to receive more attention and consequently more investments in the future.

The underlying trend of a growing world population with growing demand will continue. Whether companies will benefit from this will depend whether they can meet demand. Textile products need to offer added value. This can be special innovative fibers that are meeting environmental and/or health concerns. Products need to be produced in an environmentally friendly way. Digitalization offers companies to align their internal processes as well as those with their partners in the value chain thus becoming more efficient and demand oriented.”



CCFA, China Chemical Fibers Association Duan Xiaoping, Chairman

“According to the research on technological development in the 13th Five-year period which was carried out by the CCFA this year, refinery-chemical integration, functionalization, differentiation and high performance fibers are highlights of industry development. In the meanwhile, labor shortage, machine replacing human labor during the virus, supply chain management, variety and quality are key factors of enterprise competition and customer relationship maintenance. In the 14th Five-year period (2021-2025), micro-plastics issue will further enhance the green technology, machine replacing human labor will contribute to intelligent manufacturing, and the cost competition will have a transition to talent and core advantage competition.

Green technologies are the future and this includes several aspects:

1. Energy saving and emission reduction technologies should be promoted, the goal of green production should be achieved by superimposing and strengthening such technologies.
2. The use of recycling technology, currently mainly involves the utilization of used plastic bottles, factory scraps and materials generated from waste disposal. The key point as well as the difficulty of the next step is to solve the issue of hybrid fiber system, that is, how to recycle the waste products.

y?



3. Biodegradable raw materials and bio-based chemical fibers should continue to support the development of bio-based fibers represented by PLA in the face of plastic crisis and particulate crisis.

In addition, the application of large quantity and wide range of green catalysts in polyester is also one of the key points of green technology. Based on the current status of green technology development of chemical fiber, compared with degradable polyester and bio-based chemical fiber, recycling economy maturity is relatively high, and is also one of the main focus of current green technology development.”

“In addition, the application of large quantity and wide range of green catalysts in polyester is also one of the key points of green technology.”



CIRFS, European Manmade Fibers Association
Frédéric Van Houte, Director General

“The manmade fibers industry is a pioneer when it comes to circular economy. So far, every effort has been undertaken to keep the value of products and materials in the economy through the highest efficiency in the production process, reduced use of resources and raw materials, the recycling of waste in production wherever possible as well as a growing use of renewable, biodegradable/compostable materials and secondary raw materials as inputs.

As such, circular economy will profoundly influence the future of the manmade fibers industry and will bring a lot of new opportunities, some of which have already appeared during the Corona virus pandemic – protective and medical equipment, new functionalities in traditional textiles, increased use of sportswear and many more. The recyclability of manmade fibers may even represent a competitive edge over natural fibers. And the need for variety, smaller series and proximity as well as collaboration along the value chain in terms of recycling will lead to regional shifts and relocations.

When it comes to circular economy, there is no one-fits-it-all approach for manmade fibers. Every polymer has its specificities. What is es-



sential is to have the right framework and the necessary legal instruments in place. Eco-design, standards, separation/recycling, traceability, a proper interface with other legislations (e.g. REACH) and collaboration within the value chain will be important. Imports have to be addressed as well. EU production is only a small share in total EU textile consumption!

As a supplier of material to the textile value chain, the EU manmade fiber industry will continue its efforts on circularity. It is ready to take further responsibility to tackle the

issue. Together with all stakeholders from downstream users to recyclers – and with the support of authorities: European, national, regional and local. It is our responsibility to preserve the world’s resources. Together, let’s make circular economy happen!”

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Global Fiber Congress Dornbirn

Webinar Week in place of symposium

Due to the coronavirus crisis, the Global Fiber Congress took place virtually in Dornbirn for the very first time this year. In the form of a Webinar Week, the Smart, Integrated, Digital Textile Production Chain, PPE (Personal Protective Equipment), New Recycling Technologies, Circular Economy and Future Rules & Regulations for Textiles focal topics were illuminated with specialist presentations and panel discussions.

And the Oerlikon Manmade Fibers segment was also part of the program with a presentation on the topic of nonwovens manufacturing technologies by Dr Ingo Mählmann, Head of Sales & Marketing at Oerlikon Nonwovens. The rising demand for protective masks and other medical protective equipment since the start of the coronavirus pandemic and the associated global ramping up of production capacities has also resulted in an increase in the demand for nonwovens production machinery.

The Manmade Fibers segment's Head of Product Management Markus Reichwein spoke on the topic of 'the sustainable textile industry' and presented recycling solutions. As the only manufacturer, the Oerlikon Group's Manmade Fibers segment offers the entire mechanical recycling chain – from preparing the recycled materials, producing the melt all the way through to the textured package.

However, digital products are also essential for more sustainable manufacturing: fully-networked, smart factories are able to minimize the incidence of waste. Sylvain Huck, Technology Manager Digital at Oerlikon Manmade Fibers, gave a presentation on digital solutions for more sustainable manufacturing.

The new format was very well-received with in excess of 400 people participating in the opening session alone. » (bey)



The Fiber Year Outlook

COVID-19 will not trigger de-globalization

Fibers and Filaments asked Andreas Engelhardt, President of The Fiber Year Consulting, about the current development of the fiber markets and its outlook. It is in the nature of projections that they are full of imponderables, particularly at this unprecedented time. In a nutshell, COVID-19 will not trigger de-globalization, but might lead to lower demand levels for a couple of years.

Slowing fiber production and deceleration along the entire textile chain was already visible before the COVID-19 outbreak, when world economic growth recorded its slowest pace in a decade following intensifying trade uncertainties and barriers, a slowdown in major economies and geopolitical tensions that weighed on business sentiment and resulted in machinery investments and household consumption decelerating. The average annual growth in fiber supply totaled 3.8% for the century, virtually doubling world market size thanks to strong gains in manmade fibers – primarily polyester and viscose fibers.

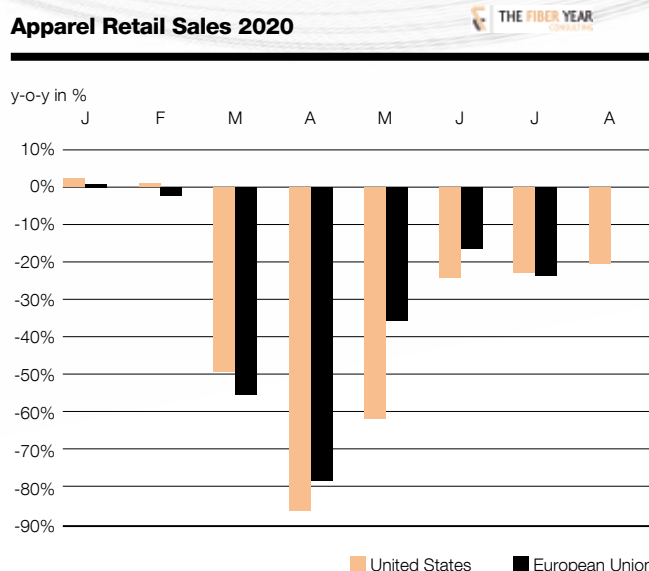
The World Health Organization (WHO) declared coronavirus a pandemic on March 11, with more than 30 million reported cases by mid-September. Precautions around the globe to avoid undampened spreading caused global social and economic disruption. Asian operations that relied on Chinese fiber or fabric inputs for processing were most exposed to initial supply chain disruptions. Lockdown measures

have led to the closing of many stores and the shutdown of non-essential manufacturing. Hundreds of millions of jobs were lost globally and an uncertain recovery leaves the question unanswered as to when people will earn a living again.

Consumers cleaned out their wardrobe

Retail sales plummeted, with apparel worst hit (Figure 1). US sales at clothing and clothing accessory stores dropped 86% in April and 62% in May – down 33% between January and August, equal to a shortfall of \$58 billion. In the 27-nation European Union, which became the new epicenter of coronavirus infections in March, retail sales contracted 55% in March and 79% in April.

(Figure 1)



Consumers in industrialized nations attached greater importance to savings. In the first quarter of 2020, the euro zone, for instance, achieved an all-time high in the household saving rate. Growing concerns regarding job security and future income, as well as the unpleasant feeling of wearing face masks and social distancing regulations when shopping, made essentials the focal point of interest. Consumers preferred to clean out their wardrobes during the stay-at-home order, still leaving them with plenty to choose from.

What happened in the markets?

All major textile and clothing exporting industries suffered from steep double-digit contractions, with the joint shortfall for the listed economies accounting for around \$37 billion (Figure 2).

Chinese data include clothing exports only as an obvious re-classification of face masks, conveniently reporting the textile category as having grown despite heavy losses in exports of textile raw materials, yarns and fabrics. Apparel shipments, with above-average contraction of knitwear exports, fell by about \$15 billion to \$51 billion in the first half 2020.

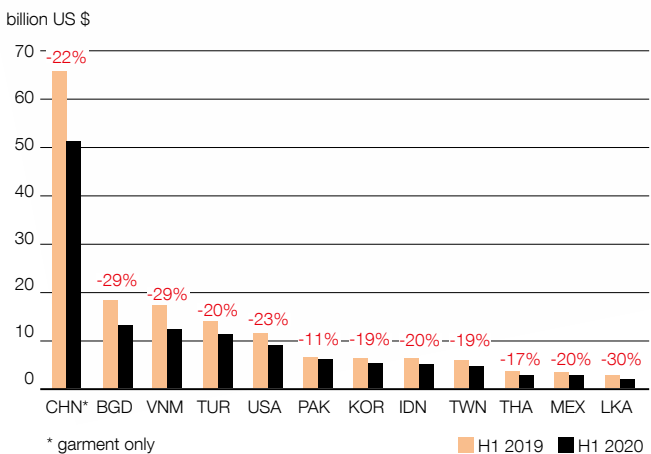
Bangladesh and Vietnam suffered from a fierce 29% contraction of textile and clothing exports. This slump poses a severe challenge to the economy in Bangladesh, as the textile chain is of paramount importance for generating foreign exchange, with its share in national exports being one of the highest in the world at nearly 90%. In contrast, the Vietnamese export structure is more diversified with textile and apparel accounting for about 15% of exports.

Turkey benefited from strong gains in the first two months after the coronavirus outbreak in Asia, as European apparel orders moved to Turkey, with primarily woven garment exports soaring by 9%. Total shipments fell by between 23% and 61% month-on-month between March and May after Europe became the new epicenter of coronavirus infections. Performance in the first six months was 20% lower at \$11 billion, which corresponds to a share in national exports, as in the case of Vietnam, of 15%.

The simultaneous crisis of supply and demand poses a life-threatening burden for the entire world and economic activity is not expected to normalize in the near future despite policy support. The further daily surge of new coronavirus cases to top levels and an increasing number of countries facing a second wave may lead to another economic growth rate adjustment, already revised downwards by the International Monetary Fund in June to -4.9% for 2020, following reimposing of lockdown measures or the extension of restrictions. In addition, consumer sentiment may worsen even further when the regular flu season meets coronavirus.

(Figure 2)

H1 2020 Textile and Apparel Exports



The impact on the 2020 world fiber supply

The precise impact on 2020 world fiber supply, given the uncertain course of the pandemic until effective vaccine and therapy options are globally available, is difficult to predict; but it seems that global market size may contract by around 10%. This would be equal to a volume of 105 million tons globally at best. It becomes apparent that reduced output volumes will essentially be at the expense of manmade fibers, as operating rates fell with the distinct drop in demand, notably all types of filament yarns and acrylic staple fibers. Latest projections of cotton production suggest modest growth in the 2019/20 season before declining about 5% in the subsequent season. However, stock levels coming close to annual demand may trigger trouble in price terms.

It is estimated that the fiber volume entering the processing chain, a key figure newly introduced in the current 'The Fiber Year 2020' report, for knitted and woven fabrics, nonwovens and unspun end uses will contract by about 14% to roughly 97 million tons, which represents a six-year low. Hence, inventory accumulation is gaining weight with cotton stocks anticipated to increase by 18% and manmade fibers estimated to expand by 4 million tons.

What can we expect after coronavirus in terms of supply and demand?

No matter whether it is in late-2021 or in 2022, the world will not return to what life was like before January – it will simply adjust to a 'new normal', which will be on a lower level than we have been accustomed to. The impact on globalization remains to be seen, as countries are realizing the importance of being able to supply themselves. Will it lead to



Andreas Engelhardt,
President The Fiber Year Consulting

a revival of local manufacturing? It may affect future sourcing for life essentials, such as pharmaceuticals from the world's largest exporters in China and India. Apparel is neither strategic nor essential, but just a fashionable item with ongoing pressure on prices. Relocation of processing chains from low-cost countries seems implausible and safeguarding against future supply-chain shocks is not a strong argument to re-shore garment capacity to higher-cost domestic markets in the age of shareholder value and quarterly earnings reporting. Large manufacturers and retailers may prefer to push regional diversification in Asian low-cost areas, also to be inured to upcoming trade issues. It may well be that the sudden installations of several meltblown lines in Europe and the US offer urgently-needed personal protective articles will later look for alternative end-uses and regional interests may ensure sufficient utilization rates to be better prepared for a next state of emergency.

Demand will remain depressed in the apparel business that consumes more than 55% of world fibers. It has been extremely hard hit, with several retailers already filing for insolvency. The general trend

towards boosting digital presence will gradually lead to the closure of an increasing number of stores. Companies have invested in remote work tools and – without having workplaces or recreational spots to go to – why should people buy new outfits? Wearing a white shirt during a Zoom conference and then returning it to the closet until the next virtual meeting will not prompt consumers to update their wardrobe from season to season. The carpet and home textiles segment has experienced positive signs, as mass work-from-home policies have inspired people to refurbish their homes. However, growing private residential expenditures for a certain period cannot compensate for the absence of non-residential investments. Ongoing store closures in favor of online sales and continuous working from home with more office space remaining vacant will not only significantly change townscapes, but also result in a possible housing crisis. Less business travel may also contribute towards reduced demand from hotels and restaurants.

Industrial textiles were already struggling before the COVID-19 outbreak, as global vehicle production began to decline in 2018 and international travel restrictions caused aircraft deliveries to plummet in the January to August period by 43% at Airbus and 68% at Boeing. The car industry firstly needs to overcome a structural crisis that got worse this year with COVID-related falling disposable incomes and consumers' increasing wait-and-see attitude on emissions-free mobility. Continental, a major German automotive supplier, recently expanded its restructuring program as the company's expectation is that vehicle production will not return to the pre-crisis levels of 2017 before 2025. » (ae)

A photograph of an industrial facility at night, viewed through a window. The scene is dominated by a large, dark, curved metal structure in the foreground, which frames the view. In the background, a complex of industrial buildings, pipes, and towers is illuminated by bright lights, creating a stark contrast against the dark night sky. The overall color palette is a mix of deep blues and greys, punctuated by the warm yellow and white lights of the facility.

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neumag

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nonwoven